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National Audubon Society's Estuarine Research Project (ERP)

Test 7 Ecological Monitoring Results: The Effects of Changes in Taylor Slough Water Delivery Patterns on the Mainland Coastal Wetlands of Northeastern Florida Bay: Aquatic Plants, Fish and Roseate Spoonbills.

Final Report

Cooperative Agreement # CA 5280-5-9018

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INTRODUCTION

Implementation of Test Iteration 7 of the Experimental Program of Water Deliveries to Everglades National Park (ENP) officially began October 1, 1995 (USACOE 1995). The Environmental Assessment (EA) for Test 7 spelled out the design and terms of the test iteration. The EA specified that an integral part of the test was the establishment of a monitoring program to assess ecological responses during the period of Test 7. Four criteria were used to rate various potential monitoring projects (USACOE 1995). The first criterion of primary importance was the potential sensitivity of the monitoring protocol to hydrological change. The other criteria were: 2) the existence of baseline data so that evaluations could be made, 3) relevance to ecological modeling efforts (specifically the ATLSS modeling effort) and 4) significance to Section 7 of the Endangered Species Act. Based on these four criteria, the National Audubon Society's Estuarine Research Project (ERP) was rated as essential to the Test 7 monitoring program (USACOE 1995) and was subsequently contracted by the U.S. Army Corp of Engineers (USACOE) and Everglades National Park. Under the auspices of the Test 7 monitoring program, the charge to the ERP was to evaluate the relative impact of Test 7 on the biota of the mainland coastal mangrove wetlands between the fresh water environs of the Taylor Slough/C-111 basins and Florida Bay. This final report evaluates the impact of Test 7 during the contract period (June 1995 to September 1999).

As specified in the Cooperative Agreement (CA 5280-5-9018) between Everglades National Park and the National Audubon Society (NAS), the ERP focused on satisfying four objectives:

1. The primary objective of the ERP was to monitor fish abundance and diversity at NAS historical sampling sites in the mainland coastal wetlands and correlate fish abundance with hydropatterns and hydrography.
2. Monitor nesting parameters of Roseate Spoonbills at the largest colonies in the northeastern and northwestern regions of Florida Bay in reference to prey fish abundance in the mainland coastal wetlands. (This was not one of the original objectives and was added to the project scope in 1998. As such, only one year of data was collected under this contract).

3. Monitor community structure and abundance of submerged aquatic macrophytes in the creek systems associated with the four NAS mangrove sites in reference to hydropatterns, and fish community structure.
4. Examine the biology of the introduced Mayan cichlid (Cichlasoma urophthalmus) and the impact that this fish species has on the native community.

The remainder of the report addresses each of these objectives individually. The main text of the report provides a summary of the methodology, results, analyses, and conclusions used to satisfy the four objectives. Appendices referenced in each section provide more detailed accounts of various aspects of the ERP.

OBJECTIVE 1: Monitor fish abundance and diversity in reference to hydropatterns and hydrography

Background Information

Importance of mangrove fishes. The community of small fishes that thrive in the mangrove areas north of Florida Bay are a vital food source for a variety of important animal species. In addition, these prey base fishes are excellent indicators of ecosystem health because they have naturally high rates of reproduction and mortality (their life span can be as short as 3 months). As a result, the community will quickly show quantifiable changes in response to changes in habitat quality. These fishes are also useful as indicators because their small size limits movement. They spend their entire life cycle within the mangrove habitat and, as much, are termed 'resident mangrove fishes'. Many of the larger fish species, birds, and reptiles that are used as indicators of ecosystem health are wide-ranging allowing them to move to more favorable secondary habitats when conditions deteriorate in their primary habitat. These mangrove transients may not accurately reflect short term perturbations in the mangrove system. Since the resident fish community cannot leave the system when adverse conditions arise, they better reflect changes in mangrove hydrology.

Description of sampling sites The eastern-most sampling site was located on Biscayne Bay near the western end of Card Sound Bridge on Barnes Sound (Figure 1; BS: 25° 17.65N by 80° 24.57'W). This site was impounded by roadbeds and received no freshwater sheet flow from the Everglades, therefore, all freshwater input to BS was from local rainfall or groundwater

seepage. As a result, water management operational changes have only minimal impacts on the hydrology of this site, i.e., this location is considered the control site when examining the impacts of water management.

The other three sampling sites were located just north of Florida Bay in the Taylor Slough/C-111 drainage area of ENP (Figure 1). These sites were located north of Little Madeira Bay on Taylor River (TR: 25° 13.20'N by 80° 39.00'W), north of the eastern end of Joe Bay (JB: 25° 15.00'N by 80° 31.92'W), and on a tributary west of Highway Creek (HC: 25° 15.25'N by 80° 27.28'W) near US Highway 1. General areas for site locations were selected based on the potential to show differences in the prey base community due to the influence of natural fresh water Everglades sheet flow. Specific sampling sites were selected based on close proximity (within 1 km) to ENP hydrological monitoring stations so that the data collected by these stations could be used to interpret the results of fish collections.

Historically, the amount of fresh water these sites received from the Everglades presumably decreased from west (TR) to east (HC) based on site proximity to Taylor Slough. However, the natural sheet flow pattern of the Everglades has been largely disrupted by channalization. Since about 1983, the amount of fresh water received at TR, JB and HC has primarily been determined by water management operations (Johnson and Fennema 1989). Fresh water sheet flow now reaches northeastern Florida Bay via both Taylor Slough and the C-111 canal. Water from the C-111 exits the canal through 55 gaps in the southern levee along the lower (east to west) reach of the canal (Ley et al 1995). Ultimately, these gaps allow water to flow southward, resulting in sheet flow into northeastern Florida Bay. Between 1983 and 1990, about 90% of water arriving at Florida Bay was delivered via the C-111 canal (Johnson and Fennema 1989, Ley et al. 1995). Because the eastern-most gaps were at a lower elevation than the central or western gaps, most of this water exited the canal near US-1. This resulted in the majority of fresh water being delivered to the Highway Creek (the HC site) region of Florida Bay with decreasing amounts of fresh water being delivered to the bay at more western locations. Starting in about 1990, a series of operational changes were made concerning the C-111 canal so that a more equitable distribution of water was delivered across the northeastern coast of Florida Bay (Ley 1995). These changes were moderately successful at accomplishing this goal (Ley 1995) and have resulted in a variety of hydrological regimes at the three Florida Bay mangrove sampling sites since 1990.

All sites were located in similar dwarf mangrove habitat and each was characterized by a deep central creek (creek microhabitat) surrounded by shallow flats that became seasonally exposed (flats microhabitat). Vegetation consisted of widely spaced (0.5-5.0 m between plants) dwarf red mangrove (Rhizophora mangle) trees (0.5-2.0 m tall) with varying amounts of vegetation between trees. Growth of Eleocharis sp., Utricularia sp. and Chara sp. was seasonal. The substrate for all sites was flocculent, unconsolidated, carbonate marl (Browder et al. 1994).

Hydrologic cycles. The mangrove ecotone of northeastern Florida Bay does not experience a lunar or diurnal tide (Holmquist et al. 1989). Water depth in the mangrove swamp is controlled by three factors that cycle seasonally: sea level, wind, and rainfall. Starting approximately in June, water levels climb throughout the summer months and peak in late September or early October. Water levels typically decline through October and November culminating in dry season conditions from January through April or May. Salinity follows a similar but inverted pattern to water level. Salt concentrations are typically highest in late May or early June and decline over the summer months reaching fresh water or near freshwater conditions in September and October. A steady rise in salinity beginning in November and continuing through February follows. March is typified by a sharp rise in salinity which continues through to the beginning of the wet season. Because the natural break point in this cycle is caused by the initiation of the wet season, all analyses focus on the hydrologic year (June to May). This stereotypic cycle is affected by a high degree of spatial, inter-annual and intra-annual variation of physical conditions in the mangrove zone.

Expected impact of Test 7. The goal of the Experimental Program of Water Deliveries was to restore and maintain the natural abundance, diversity and ecological integrity of ENP, including Florida Bay, by attempting to restore the hydrology of ENP lands to a state that resembled the pre-drainage condition (USACOE 1995). The USACOE conceded in the EA that Test 7 was not wide enough in scope to fully accomplish this lofty goal (USACOE 1995). However, Test 7 was designed to improve overall hydrologic conditions in ENP. In the mangrove zone, Test 7 was expected to increase fresh water flow, thereby lowering salinity and increasing hydroperiod. Consequently, this change in physical conditions would be expected to have a positive impact on biological productivity.

Methods

Hydrologic monitoring. In addition to data provided by nearby ENP hydrostations, water levels were continuously monitored at each site using a Telog brand 2108 potentiometric recorder with a float and pulley design. Accuracy of the equipment was checked by comparing the current measurement of the recorder against a nearby staff gauge each time the system was downloaded. Gaps in the water level record were supplemented with regression adjusted data from the nearby ENP hydrostation. Regression models between the Telog data and ENP hydrostations at TR, JB, HC and BS explained 97%, 87%, 86%, and 94% of the variability, respectively. All regression equations were significant ($p<0.01$) and a review of residuals indicated that none of the assumptions for regression analysis were violated.

Salinity was measured at the site on the day of fish collections using an optical refractometer. These data were strongly correlated to the data recorded by the nearby ENP hydrostations, however there were differences between the two methods. Therefore, the continuous records from the ENP hydrostations were refined to better reflect conditions at the sites through the application of regression models. The hydrostation at TR was located immediately adjacent to the site and was found to be strongly correlated with the refractometer data ($r^2=0.96$). Breakpoint regression was used to convert hydrostation data at JB and HC because the relationship between the refractometer and hydrostation changed between the wet and dry seasons. The breakpoint and regression equations were derived using the computer program 'Statistica' (Statsoft 1995). The conversion models generated by this method explained 92% and 84% of the variability between the refractometer and hydrostation data sets for HC and JB respectively. All regression equations were significant ($p<0.01$).

Salinity at BS was found to fluctuate diurnally with tidal exchange. As a result, the correlation between the single refractometer reading collected on the day of fish collection and the average daily salinity generated by the hydrostation were not as clear as at the other sites ($r^2=0.54$). However, based on close spatial proximity, conditions recorded at the hydrostation were assumed to accurately reflect conditions at the site. The strong relationship between mean daily water level recorded at the station and the site ($r^2=.95$) lends strong support to this assumption. Therefore, the salinity regression was used as a predictor of on-site salinity. Although the low precision of this model may result in slight miscalculations in the estimation of on-site salinity on a daily level, its' impact on long term trends is likely to be insignificant.

Fish collections. A $9m^2$ drop net method was developed for this study and has been demonstrated to be an effective and unbiased sampling method in this habitat (Appendix A, a manuscript published in the journal Wetlands, provides the details of this sampling method). Nets were set up, left over-night, and deployed the following day within 2 hrs after sunrise. Each net surrounded an individual dwarf mangrove tree, thereby sampling both prop root habitat and the open area between trees. Trees were selected for sampling such that each site had a similar array of tree sizes with roughly equivalent prop root density sampled between sites, i.e., there was consistent sampling of the stationary habitat (as per Browder and Moore 1981) from site to site. Fish were cleared from the net using the fish toxicant rotenone. Any fish missed in the initial collection were found floating on the surface the next day and added to the sample (Appendix A). Net clearing efficiencies ranged from 78% to 90% for the most common fish species and averaged 86% for all marked and recaptured fish (Appendix A). All fish collected were identified, weighed and measured. Weights for specimens collected during the second day collection were calculated from length-weight regressions generated from first day collection fishes. The majority of fish collections were made during the dry season and transitional periods so that the impact of fluctuations in hydrology could be assessed. Sample collections were made in June, September, and monthly from November through April.

While the $9m^2$ drop net was designed to catch the small demersal fish (Appendix A), incidental collections of larger fishes did occur. A single large bodied fish could weigh more than the entire sample of smaller fish thereby biasing estimates of biomass. Length frequency distributions indicated that the collection of fish larger than 6.5 cm was rare in the creek microhabitat and did not occur on the flats. The flats microhabitat made up 75 to 90 percent of the habitat utilized by the demersal fish (<6.5 cm) community, indicating that fish larger than 6.5 were not functioning as an integral part of the demersal fish community. In order to accurately analyze the community of small demersal fishes, all fish larger than 6.5 cm (3.2% of total fish collected) were not used in the statistical analyses, however, in an effort to completely present all data, fish larger than 6.5 cm were included in all summary tables unless otherwise noted.

Preliminary data indicated that the abundance of demersal fishes differed between creek and flats even though the physicochemical parameters were uniform across the two microhabitats. For example, during periods of declining water level, high mortality may occur as fish on the flats are stranded. Those that survive are forced into the creeks. In this situation, sampling only the creek microhabitat would result in the conclusion that sharp declines in water level resulted in increased

fish abundance (due to the concentration of fishes into the remaining wetted habitat). However, when the entire landscape subjected to the water decline is considered, the observed effect would be that decreasing water level resulted in fewer fish overall (due to stranding mortality). The concentration effect obfuscates the impact of declining water levels on the demersal fish community across the entire landscape. In order to make statements about the impact of water level (or other physiochemical parameters) on the community as a whole, the estimated abundance of fishes in both microhabitats would have to be combined into a single meaningful estimate of abundance that is uniform across the entire landscape. Therefore, a stratified mean biomass and number of fish per m^2 (density) was calculated for each sample by averaging the weighted means for each habitat type (Cochran 1963). Three nets were collected in each microhabitat (creek and flats) at each site, for a total of six nets per sample (see 'Description of Sites' in the 'Background' section).

Calculation of a stratified estimate requires that the weight of each strata (in this case the wetted area of the creeks and the flats respectively) be known. Since wetted area changed in response to water level variations, remote sensing techniques were employed to estimate wetted area of each strata at any given water depth. High altitude false color images (1:1800 scale) depicting 1 km^2 of wetland centered on each sampling site were acquired from ENP. Using the selection criteria of the Idrisi GIS package (Eastman 1995), each image was separated into several discrete color bands representing small incremental changes (on the order of about 5 cm) in wetland surface elevation. Each site was then surveyed physically to determine the depth range of each color relative to the continuous water level recorder. The ground-truthed GIS images could then be used to estimate wetted area for each sample, and a stratified mean biomass and density based on the strata weights could be calculated.

Findings

General Findings. Appendices B and C present a series of summary tables for each fish collection made during Test 7. Each table summarizes an individual collection date. The number of each species collected in each net are summarized in Appendix B. Similarly, the biomass of each species per net is summarized in Appendix C. Species are listed in order of decreasing abundance or biomass. Summary statistics, physicochemical parameters, the date of collection, and the number of nets sampled in creek and flats sub-habitats are also provided in each of the tables. Both appendices are organized chronologically by month, with the sites presented in alphabetical order (e.g. June 1995 was the first sample collected, so the first table

summarizes the June 1995 collection at BS, followed by summary tables for the June 1995 collections at HC, JB and TR). The first page of appendix B and C provide more information about the organization of the tables. Summary tables for the June and September 1999 collections are also presented, however, the hydrologic cycle for the 1999-2000 year will not be completed until May 2000, so analyzing these collections would be premature at this time. These data are included here to demonstrate that the collections were made and the contractual obligations were met. These data will be analyzed as part of any future contracts between NAS, ENP and USACOE.

Fish collections made between June 1991 (collections from June 1991 to June 1995 were made prior to the existing contract) and May 1996 were analyzed in conjunction with hydrologic data. Analyses focused on the impact of fluctuating salinity, water level and temperature on the fish community in order to better understand the impact that water diversion has had on the ecotone. Regression analysis indicated that fish density was significantly related to both short term and long term changes in water level. Analysis of variance of density between sites supported the regression, indicating that longer hydroperiod (defined as the period of time that the flats were fully inundated) sites had higher densities than sites with shorter hydroperiods. Changes in biomass were primarily related to long term salinity conditions and secondarily to long term changes in water level. Analysis of variance of biomass between sites indicated that sites with longer freshwater periods had higher biomass than sites with shorter freshwater periods. Detrended Correspondence Analysis (DCA) of community biomass explained 59.2 % of the variance and supported the hypothesis that salinity was a primary determinant of community structure. Appendix D (a manuscript published in the journal Estuaries) provides a detailed account of these analyses.

The analyses and discussion in Appendix D indicate that anthropogenic changes in water delivery could have negatively impacted the demersal fish community in the coastal wetlands of northeastern Florida Bay. The implication is that decreased freshwater flow to Florida Bay as a result of water management practices may have eroded the ecosystems trophic structure from the bottom up. This situation is potentially reversible: changes in the quantity of fresh water and the timing of deliveries to the mangrove zone via Taylor Slough and the C-111 canal could create longer hydroperiods in the mangrove zone. Longer hydroperiods would also reduce salt water intrusion into the area, and may help re-create the higher secondary productivity that was once

associated with the Everglades/Florida Bay interface. Test Iteration 7 was designed as an initial step in a plan to increase hydroperiods and lower salinity patterns in the coastal wetlands of northeastern Florida Bay (Ley et al. 1995, USACOE 1995).

Impacts of Test 7. In an effort to evaluate the impact of Test 7, fish collections from the 1996-1997, 1997-1998, and 1998-1999 hydrologic cycle years were analyzed individually in reference to rainfall, water level, and salinity patterns. Twenty years of rainfall data from 26 locations across southern Florida were examined using Analysis of Variance (ANOVA) and Correspondence Analysis (CA). These techniques allowed for the identification of years prior to the start of Test 7 (October 1995) that had similar spatial and temporal patterns in rainfall to each of the three subject years. Comparing water level, salinity and fish community data collected under Test 7 with data collected under similar rainfall conditions before Test 7 allowed for a classic before and after analysis. Any differences in these parameters might be attributed to alterations in the water delivery caused by Test 7 operational conditions.

The quantity of rainfall across southern Florida in 1996-1997 was found to be temporally and spatially similar in pattern to rainfall recorded in 1993-94 (Appendix E). Likewise rainfall patterns in 1997-1998 were very similar to those of 1994-1995 (Appendix F). The best rainfall relationship available for the 1998-1999 cycle year was a comparison with 1992-1993 (Appendix G). Hydrologic analyses of the coastal wetlands of northeastern Florida Bay between years with similar rainfall (i.e., 1996-1997 was compared 1993-1994, 1997-1998 was compared to 1994-1995 and 1998-1999 was compared to 1992-1993) indicated very few differences in water level or salinity patterns between Test 7 years and those years prior to Test 7. The minor hydrological differences that were apparent were attributed to temporal differences in the rainfall pattern between years and not to water management operations. There were no differences in the abundance nor the community structure of fishes in the coastal wetlands during Test 7 years compared to years prior to Test 7. A detailed account of the analyses and conclusions are presented in Appendices E, F, and G.

Based on the results of these analyses, we concluded that Test 7 had little or no measurable impact on northeastern Florida Bay. This is not surprising given that the designs set forth in the Test 7 EA were not followed. Although the Test 7 EA called for retention of wet season water in the system as opposed to dumping it to tide, Test 7 did little to accomplish this goal. The most glaring short-coming of Test 7 was that Phase 2, which included the most

substantive changes to the system (USACOE 1995), was not implemented during the period of this study. Furthermore, the protocol set for Phase 1 was all but abandoned during the last three dry seasons.

Phase 1 called for an increase in water delivery to Taylor Slough by increasing the pump capacity at S-332 to 495 cfs (USACOE 1995). This would allow water that had previously been pumped to tide via the SDCS, to remain within the Everglades system. Under this plan, the amount of water exiting the system though the South Dade Conveyance System (SDCS), specifically through S-197, would be greatly reduced if not eliminated. However, events during each of the three dry seasons effectively suspended Test 7, which resulted in the release of large amounts of fresh water during the late wet season and dry season through S-197. In November 1996, S-197 was fully opened in preparation for Hurricane Lily, which never made landfall. This event may have lowered the water table by as much as 1.5 ft (Appendix E). Water managers responded similarly to Hurricane Georges in September 1998 and Tropical Storm Mitch in November 1998 (Appendix G). Test 7 operations were suspended for each of these events.

Another complicating factor in carrying out Test 7 protocols was the Cape Sable Seaside Sparrow emergency actions which ultimately resulted the loss of large quantities of fresh water from the system (Appendices F and G). In 1997-1998 and 1998-1999, dangerously high water threatened to irreparably damage tree islands in Water Conservation Area 3 (WCA-3). In previous years, water from WCA-3 was allowed to flow into northwest Shark River Slough via the S-12 control structures. However, this reallocation of water resulted in high water levels in the marshes that serve as the primary nesting area for the federally endangered Cape Sable Seaside Sparrow. In December 1997 and January 1998, high water levels on sparrow nesting marshes prevented the birds from nesting. In response, water managers rerouted excess water from WCA-3 into the SDCS. Much of this water was released to tide at S-197. Similarly, an emergency action related to the sparrow also resulted in the suspension of Test 7 during the dry season of 1998-1999.

These events (tropical storms and emergency actions) circumvented any success that Test 7 may have had in retaining wet season water in the southern Everglades, and ultimately, there were no apparent differences in the hydrology or hydrography of the coastal wetlands in the last 3 years of Test 7 (Appendices E, F, and G). In addition, there were no differences in fish

abundance and community structure in comparisons of Test 7 years with pre-Test years (Appendices E, F, and G). Since these fish parameters were found to be largely determined by hydrography and hydrology (Appendix D), the results of the fish community analyses supports the contention that Test 7 had little or no impact. Simply stated, Test 7 did little to change the dire conditions in the coastal wetland ecosystem of northeastern Florida Bay because Test 7 was never properly implemented.

OBJECTIVE 2: Monitor nesting parameters of Roseate Spoonbills at the largest colonies in the northeastern and northwestern regions of Florida Bay.

Background Information

Ninety percent of the Roseate Spoonbills breeding in Florida nest on mangrove islands in Florida Bay within the boundaries of Everglades National Park (ENP) (Bjork and Powell 1996). At present, they are a Species of Special Concern in Florida (Wood 1997). Historical accounts from the 1800's indicate that a large population of Roseate Spoonbills once existed in the state, including a large presence in Florida Bay (summarized in Allen 1942 and Powell et al. 1989). During the last half of the 1800s, and continuing through the early 1900s, the Roseate Spoonbill population was greatly reduced by direct human disturbance. During this period, plume hunting was a highly lucrative profession in southern Florida (Graham 1990) and spoonbills were heavily affected (Allen 1942). Spoonbills may have been targeted by plume, subsistence and sport hunters or may have been incidentally impacted by these activities (Allen 1942; Graham 1990). Regardless of intention, hunting practices had greatly reduced spoonbill numbers by the time prohibition of plume hunting and protection of nesting colonies began in the early 1900s. Illegal sport and subsistence hunting probably continued the decline, and, by the early 1930s, fewer than 200 pairs were thought to nest in Florida (Allen 1942). By 1935, continued human depredation on adults and eggs had probably eliminated all colonies except the Bottle Key colony which had been reduced to 15 pairs (Allen 1963). By 1941, it was thought to be the only remaining active colony in Florida (Allen 1942). After 1940 no spoonbill counts were made until Allen resumed his Florida Bay surveys in 1950. At that time he found larger numbers of nesting birds and a greater number of active colonies compared to his surveys in the 1930s (Allen 1963).

Powell et al. (1989) recounted the history of Roseate Spoonbill nesting in Florida Bay from 1935 to 1989. Approximately every 10 years from 1955 through 1978, the nesting population doubled. In the 1978-79 season there was a dramatic increase in the number of breeding spoonbills over the previous two years, with the population exceeding 1200 breeding pairs (Powell et al. 1989). No information is available for the five years subsequent to 1978-79, but by 1984 (when population surveys were re-initiated) the nesting population had declined to about 400 nests. Powell et al. (1989) speculated that this decline may have been caused by water management practices in the mainland coastal wetlands of northeastern Florida Bay as these were the primary foraging grounds for most of the spoonbills nesting in Florida Bay at that time.

Roseate Spoonbills feed by tactolocation (Allen 1942). While feeding, a spoonbill swings its head so that the partially-open bill is swept through the water in a semi-circular motion. This action is performed while walking forward, giving the feeding spoonbill a somewhat inebriated appearance while feeding. When the highly sensitive 'spoon' encounters a prey item, the bill snaps shut (Allen 1942). With little cessation in forward progress, the spoonbill tosses the prey to the back of the throat by suddenly jerking the head backward out of the water.

This highly specialized feeding behavior requires that Roseate Spoonbills forage in extremely shallow environments (less than 20 cm; Powell 1987). It also allows them to take advantage of an abundant food source in the form of small demersal fishes and crustaceans found in coastal wetlands (Allen 1942). A variety of prey items have been described from spoonbill dietary investigations, however, small fishes of the families Cyprinodontidae and Poeciliidae appear to be the primary dietary items (Allen 1942; Dumas in press). Sheepshead minnow (Cyprinodon variegatus) and sailfin molly (Poecilia latipinna) were found in virtually every analysis of spoonbill diet reviewed by Dumas (In press). Crop samples from 25 nestlings from two colonies in different parts of Florida Bay contained 85-90% small fish (primarily Cyprinodontidae and Poeciliidae) with the remainder being mostly shrimp of the genus Palaemonetes (Powell and Bjork 1990).

Like many wading bird species, spoonbills appear to depend on the wet/dry seasonal cycle of southern Florida to successfully reproduce (Kushlan 1978; Frederick and Collopy 1989; Bjork and Powell 1994). During the wet season, the prey base exploits vast, seasonally inundated wetlands, thereby increasing in number and biomass (Kushlan 1978; Loftus and

Eklund 1994; DeAngelis et al 1997). The studies performed to accomplish Objective 1 of the ERP indicated that high freshwater flows toward the coastal wetlands of Florida Bay may promote high secondary production as well (Appendix D). During the dry season, the abundant prey organisms are concentrated in the drying wetlands or are forced into the remaining pools, creeks and sloughs (Kushlan 1978; Loftus and Kushlan 1987; Loftus and Eklund 1994; DeAngelis et al. 1997). Spoonbill breeding in Florida Bay is timed with seasonally low-water depths (Allen 1942; Bjork and Powell 1994), presumably because the adults depend on this concentration effect to capture enough food to raise young (Allen 1942; Frederick and Collopy 1989a; Bjork and Powell 1994; Bjork and Powell 1996; Dumas in press). Gradual and consistent declining water levels throughout the nesting cycle may be critical for successful nesting in spoonbills (Bjork and Powell 1996). Evidence of high reproductive success during breeding seasons with gradual dry downs and poor reproduction during seasons of a reversed drying trend on the foraging grounds supports this hypothesis (Bjork and Powell 1994). Therefore, ideal conditions for nesting spoonbills would result from high freshwater flow to the coastal wetlands during the wet season and low water levels in the coastal habitats during the dry season.

In the last two decades, water management practices have disrupted this natural hydrologic cycle (Johnson and Fennema 1989) perhaps explaining the decline in spoonbill nesting since the 1970's (Powell et al. 1989, Appendix H). One goal of Test 7 was, to re-establish the natural seasonal cycles in hydroperiod in the coastal wetlands. Spoonbills should positively respond if this goal is accomplished, making them an ideal candidate for the Test 7 ecological monitoring program. As a result, nesting success surveys were added as an objective to the ERP in 1998.

Methods

Because this objective was added in the 1998, only one year of nest success data was collected under this contract. Nesting surveys were conducted during the winter and spring breeding season. Sandy, Tern, and Duck keys were visited every other week from November 23 through January 31, 1999 to monitor spoonbill nesting. Once a full clutch of eggs had been laid, 53, 40 and 5 nests were tagged on Sandy, Tern and Duck keys respectively. These nests were revisited during subsequent visits (approximately every 14 days) to the colony so that nest success could be evaluated. Success was gauged by the number of chicks surviving to 21 days.

On March 26, Sandy and Tern Key were revisited. There was no activity on Sandy but spoonbills were renesting on Tern. Bi-weekly nest checks were resumed at Tern and continued through May 15. The same set of tagged nests were observed during the second nesting as were marked in the first. Sandy was visited for the last time on April 6, 1999 and there were no spoonbills on the island.

In addition to the contractual obligation of monitoring nesting success at the major colonies in the northeastern and northwestern sub-regions of the bay, NAS staff also performed a complete nest count survey for all of Florida Bay. Each of the islands listed in **Table 1** were visited at least once between the January 31 and February 19, 1999. Total nests and chicks were counted and, when possible, an estimate of nest success was made (placed in parenthesis in the table). This was the first full survey of Florida Bay spoonbill colonies since 1992. The results of a survey of 10 colonies in eastern Florida Bay was made on April 26, 1999 are also reported in Table 1.

Findings: 1998-1999 Nest Success Surveys

The most significant change since the 1992 survey was that the major nesting region in the bay had switched from the northeast to the northwest. The trend towards northwestern nesting sites began in the mid 1980's but this was the first time that more than 50% of the nests were located in that region. The increase in northwestern nesting effort coincided with a dramatic decline in nesting effort in the northeastern region. A similar switch from southeastern to northeastern colonies occurred in the 1960's (Appendix H).

Roseate Spoonbills nesting in the Southeastern Region of the bay presumably feed along the mainline keys and in the Bay in addition to foraging on the mainland (Appendix H). These 15 colonies initiated nesting approximately in late November and chicks left the colonies by about the end of February. Nesting success was approximately 40% and the total number of nests was 129 for all colonies combined. The number of nests found in this region was similar to the numbers observed over the last two decades. Visual observations from a boat on March 26 indicated that the largest of these colonies were inactive, indicating that there was no second nesting. No spoonbills or nests were found in the Bottle, Crane and Middle Butternut colonies on April 26, 1999 supporting this observation.

Birds in the Northeastern Region were found to forage primarily in the dwarf mangrove forests on the mainland to the north of Florida Bay (Appendix H) and flight line observations indicated the same this year. These 7 colonies (136 nests) initiated and completed their first nesting at about the same time as the southern colonies and also had about the same success rate (40%). It appears that these Northeastern colonies are going through or have gone through a collapse, at least during the traditional nesting period (Nov-Feb). Similar surveys conducted from 1987 to 1992 found that between 230 to 360 nesting pairs utilized the 7 colonies in the northeastern Bay (5 yr. average = 280 nests). In the late 1970's these colonies had more than 600 nesting pairs. The 40% success rate was low when compared to years prior to 1992, however, it was an improvement over the success rates observed since 1992 (1992-3=0%, 1994-5=0%, 1995-6=7%, 1996-7=27% and 1997-8=0%).

The second nesting at Tern Key was much larger than the first (208 compared to 60). Great Egrets, Reddish Egrets, Tricolor Herons, and White Ibis combined to account for more than 400 additional nests. Porjoe Key had a large (100-150 nests) mixed species colony as well, but only 2 spoonbill nests. Spoonbill nests were also found on N. Park and Jimmie Keys. A likely explanation for renesting at the northern colonies and not the southern was that ideal conditions existed on the mainland foraging grounds. Water levels in the mangrove zone were very low through May, and, as a result, prey base fish densities of greater than 100 per square meter were collected from our eastern-most fish sampling location (HC) on March 26, 1999. Landscape elevations are generally higher on the eastern side of the mangrove zone and lower toward the west, therefore the eastern mangrove zone tends to dry first. Lower than average rainfall during the spring resulted in water levels that continued to decline in a general east to west pattern. Presumably, fish continued to concentrate into the remaining wetted area thus providing continuous and sustained prey base for breeding wading birds along this east to west gradient. The last time such dry down patterns occurred in mangrove zone was the period from 1989-1992. During this period, spoonbills exhibited nesting success rates of 220%, 180% and 150% for the three nesting cycles, respectively, however, these occurred during the traditional first nesting period. The success rate for the second nesting in 1999 was 204%. This is surprising given that spoonbills traditionally did not renest.

An interesting note: Ground visits to 10 colonies in eastern Florida Bay were synchronized with a helicopter survey of eastern Florida Bay on April 26. The helicopter

surveys recorded only 4 spoonbill nests on Tern Key. No other nests were observed in eastern Florida Bay. Ground counts revealed 206 spoonbill nests on Tern Key, 2 on Porjoe Key, 7 on Duck Key, 13 on Jimmie Channel, and about 30 on North Park. This confirms Dr. Joan Browder's observation that spoonbill nests are difficult to accurately count from aerial observations.

An Analysis of 65 Years of Spoonbill Nesting Data

Sixty-five years of nesting data were analyzed in conjunction with foraging information to determine the response of spoonbills to anthropogenic disturbances. Since 1950, spoonbills have nested on 30 keys of Florida Bay. Nesting effort through time at any given colony was initially low for the first year(s) followed by a period of increase, a peak of variable duration in nest numbers, followed by a period of decrease to some lower level. This temporal pattern in nesting effort at a given colony can loosely be described as bell-shaped. Colonies in close spatial proximity tend to follow the same approximate temporal sequence in nesting effort resulting in a similar bell-shaped pattern when colonies are combined into groups based on foraging location. This may indicate that the observed pattern is a result of regional changes in food availability.

In his landmark work on Roseate Spoonbills, Allen (1942) identified four factors that could potentially explain the observed pattern. (1) Parasites and disease may impact nesting success and result in colony abandonment; (2) Disruption of nesting by raccoon invasion and subsequent nest predation may disband a colony; (3) Direct human disturbance (hunting and general colony disruption) may result in colony abandonment; (4) Availability and quality of food resources for a colony may change through time resulting in variable habitat usage by the colony. Each of these was evaluated and the preponderance of scientific evidence indicated that the availability and quality of food resources have been altered by land and water management practices in and around the Florida Bay landscape (Appendix H).

The major anthropogenic perturbations to spoonbill foraging grounds have been the filling of wetlands for urban development in the upper Florida Keys and the alteration of wetland type and function along the northeast coast of Florida Bay by water management practices. In each of the sub-regions, environmental conditions initially favored nesting and effort increased over time to some sustainable level. At varying intervals, the foraging grounds in each sub-region were anthropogenically altered and spoonbill nesting effort and nest success waned at the colonies within the impacted sub-region, thereby explaining the observed bell-shaped curve in nesting effort through

time. Nesting Roseate Spoonbills exhibited a measurable response to water management practices in the southeastern Everglades. A complete account of these analyses and conclusions is presented in Appendix H.

OBJECTIVE 3: Monitor abundance of submerged aquatic vegetation in the creek systems associated with the four NAS mangrove sites.

Background Information

Although the results of the fish collections indicated that increased salinity had a negative impact on mangrove resident fishes (Appendix D), most of the species commonly collected reproduce and thrive in freshwater to marine conditions (Simpson and Gunter 1956, Foster 1967, Loftus and Kushlan 1987, Nordlie et al. 1992). Development of offspring under various conditions of salinity and temperature has not been well documented for these species, however, several studies have been performed on closely related species. For example, in controlled experiments, Cyprinodon macularius (Kinne and Kinne 1962) and Fundulus heteroclitus (Tay and Garside 1975) exhibited normal development over a wide range of salinities and temperatures although the rate of development varied. These studies indicate that the normal range of salinity found at our mangrove sites probably had little direct effect on productivity of the resident species of fish. Although this appears to be contradictory with the findings of the fish monitoring program (Appendix D), a cogent explanation may be that, although the fish are physiologically unaffected by changes in salinity, critical resources may be limited during high salinity periods. Consequently, fish may find that the quality of the habitat is inferior at even moderate salinity levels.

The association between fish communities and submerged aquatic vegetation (SAV) has been well documented since the late 1950's (reviewed by Serafy 1992). Fish community structure and productivity is inexorably linked with the vegetation type and primary production found within a given habitat (Sogard et al. 1987, Matheson et al. 1999). In Florida Bay, Rutherford et al. (1986) linked various game fish species to SAV type. Thayer et al. (1987) and Ley (1992) characterized the fish community associated with mangrove shorelines. Thayer and Chester (1989) and Sogard et al. (1989) characterized fish communities associated with various seagrass species in basin and mud bank habitats, respectively. Massive seagrass die-offs occurred throughout Florida Bay during the late 1980's and early 1990's (Robblee et al. 1991).

As an example of the link between fish community structure and SAV type, Matheson et al. (1999) repeated the techniques of Sogard et al. (1989) at bank sites impacted by the seagrass die-off and found dramatically different community types. Likewise, Thayer et al. (1999) repeated the techniques of Thayer and Chester (1989) and documented both a decline in seagrass abundance and changes in the fish community in basin and channel habitats within the bay.

Beginning in about 1960, water management practices resulted in less fresh water being delivered to Florida Bay during the wet season (Johnson and Fennema 1989). Zieman et al. (1989) suggested that the northern half of the Northeastern Basin was dominated by the seagrass Halodule wrightii in the late 1950's. Halodule is a pioneering species that is capable of tolerating fluctuations in salinity (Zieman et al. 1989). Between 1960 and 1983, Halodule was gradually replaced by Thalassia testudinum (Zieman et al. 1989), a species of seagrass that generally displaces Halodule under stenohaline conditions, but can not tolerate salinity fluctuations to the same degree as Halodule. Zieman et al. (1989) attributed this change to consistently higher salinity in northeastern Florida Bay as a result of water diversion away from the coastal wetlands. Zieman et al. (1989) related that, beginning in the late 1970's, fishermen reported fewer mullet in the northeastern sub-region because thick Thalassia beds were not as useful as feeding areas as Halodule beds.

Rutherford et al. (1986) sampled juvenile game fish throughout Florida Bay. More than 80% of the juvenile snook collected were found in low salinity (mean 8.9 ppt), SAV dominated by Chara spp. and Utricularia spp. Juvenile spotted seatrout were mostly (>80%) collected from Thalassia and Halodule beds with a mean salinity of 17.2 ppt. Gilmore et al. (1983) found that snook depend on coastal freshwater and low salinity environments for their early life history stages. Wakeman and Wohlslag (1977; in Longley 1994) reported optimum metabolic salinity for juvenile spotted seatrout was 20 to 25 ppt. Longley et al. (1996) reported that spotted seatrout density over vegetation increased with salinity but decreased above 30 ppt. Catch rates for snook in northeastern Florida Bay declined from 1972 to 1984 while catch rates for spotted seatrout increased over the same period (Rutherford et al. 1989). These changes may be the result of changes in dominant SAV from low salinity species (e.g. Chara spp. and Utricularia spp.) to more salt tolerant species (e.g. Thalassia and Halodule) (Rutherford et al. 1986).

With the completion of the SDCS in 1983, flood control for agricultural lands during the dry season required out-of-season pulses of water to be delivered to the C-111 basin (Van Lent et

al. 1993). These pulses resulted in temporary increases in water level and salinity decreases in northeastern Florida Bay during the dry season (Baratta and Fennema 1994). As a result of this dampening of the natural wet/dry cycle (less water in wet season due to diversion and more water in the dry season due to flood control releases), salinity variability increased in northeastern Florida Bay after 1983 (Johnson and Fennema 1989).

Montague and Ley (1993) periodically sampled northeastern Florida Bay macrophytes and benthic crustaceans in conjunction with a variety of physicochemical parameters and found that high variation in salinity had a negative impact on the flora and fauna examined. Ley (1992) also found that the standard deviation of mean salinity was negatively correlated with fish biomass. Finally, Ley et al. (1994) concluded that the diets of fishes in areas of high salinity variation were inferior to those of more stable salinity environments. The authors speculated that higher variance in ambient salinity resulted in reduced productivity in benthic plants and crustaceans, resulting in lower quality prey and lower biomass in fishes (Ley et al. 1994). Stable salinity had the opposite effect. These results indicate that the salinity pulses caused by water management practices would be detrimental to plant, invertebrate, and fish communities in the northeastern sub-region.

Surveys of emergent vegetation in the area between Florida Bay and the C-111 canal indicate a steady landward increase in the width of the dwarf red mangrove (Rhizophora mangle) zone into areas that were historically fresh water herbaceous marshes (Egler 1952, Tabb et al. 1967, Ross et al. 1996). Ross et al. (In press) compared the results of their survey to a 1948 survey performed by Egler (1952). The comparisons indicated that the mangrove dominated area had expanded inland by as much as 3.3 km since the 1948 study, supplanting historic freshwater sawgrass marshes. Ross et al. (1996) stated that this rate of mangrove intrusion was greater than could be attributed to sea level rise alone. Aerial surveys were used to confirm the historical changes in the plant community of the ecotone region (Ross et al. In press). Apparently, the canal system reduced the pressure of the fresh water head resulting in more frequent and sustained salt water intrusion into this area, which would eliminate saline sensitive herbaceous plants and favor the expansion of the mangrove zone.

Although not documented by Ross et al. (1996), SAV communities likely changed along with the changes in emergent vegetation. Unpublished observations made at the fish sampling sites between 1989 and 1996 indicated that seasonal increases in salinity were generally

accompanied by a decrease in the submerged macrophyte community and that this occurrence was more pronounced in low rainfall years. In support of these observations, Dressler et al. (1991) indicated that many of the common emergent and aquatic plant species found in the ecotone are sensitive to changes in salinity. Similar to the findings of Ley and colleagues (Ley 1992, Montague and Ley 1993, Ley et al. 1994), it seems likely that the historical changes in ecotonal salinity caused by operation of the SDCS altered the seasonal and inter-annual patterns of primary producers in the ecotone and subsequently reduced the resources available to resident mangrove fish species. In turn, this may have resulted in a reduction in the quantity or quality of prey for larger vertebrate predators (e.g. wading birds, game fishes, reptiles). The following study was designed to test the hypothesis that salinity negatively impacts primary producers in the ecotone. The results will provide valuable information needed to understand the impacts of past water management practices on the ecotonal region.

The goals of the SAV surveys were: 1) Characterize seasonal patterns of submerged and emergent vegetation community structure and distribution in the estuarine watersheds along the north shore of Florida Bay from Barnes Sound to Taylor River. 2) Determine any correlations between physical factors, salinity variation in particular, and seasonal plant distribution patterns. 3) Establish baseline data in order to assess the effectiveness of any future management actions. 4) Provide collaborative and supporting data for other monitoring, experimental research, and modeling efforts.

Methods

Submerged Aquatic Vegetation Surveys at Fish Sampling Sites. In order to determine the effect salinity has on submerged aquatic vegetation, SAV surveys were performed at sites co-located with the four fish sampling sites of Objective 1. At three of the sites (TR, JB, and HC) species composition and abundance was determined for submerged aquatic vegetation in the creek habitat using the point intercept percent cover method. This sampling method employs a $0.25m^2$ quadrat with 25 haphazard points. At least twelve randomly located quadrats were sampled at each site along the length of the creek where fish samples were collected. Each quadrat was surveyed to determine percent cover for each species of submerged macrophyte, as well as total coverage. At these three sites, surveys were conducted approximately every six weeks from April 1996 to March 1999,

At the fourth site (BS), submerged aquatic vegetation was sampled semi-annually from April 1996 to May 1997 using a visual percent cover method. This method simply estimates the percent of substrate covered by macrophytes to the nearest five percent. Percent cover was estimated for each species of submerged macrophyte and for all macrophytes combined. At least twelve randomly located $0.25m^2$ quadrats (divided into 10% sections) were surveyed. Beginning in September 1997, methodology at BS was changed so that the same techniques (point intercept surveys performed at approximately six week intervals) were being used at all four sites.

Large Scale Submerged Aquatic Vegetation Surveys. Plant surveys similar to those described above were conducted along creek transects from the four fish sampling sites (TR, JB, HC and BS) to Florida Bay or Biscayne Bay. Differences in the submerged plant community were documented along a salinity gradient at five survey sites, downstream from TR, JB, and HC. The transect downstream from BS had only 3 survey locations. Initially, these sites were sampled semi-annually from May 1996 to May 1997 using the visual percent cover method. From September 1997 to March 1999, these sites were sampled approximately every six weeks using the point intercept percent cover method. The samples were increased to gain a better perspective on the seasonal changes that occur in submerged macrophyte communities due to fluctuations in water quality parameters and to have a uniform sampling method at all sites.

In order to perform statistical analyses on a data set collected using two methodologies, regression models were used to estimate point intercept values from the data collected using the visual percent cover technique. For several surveys, both the point intercept and visual percent cover techniques were performed. Regression analyses were used to compare the data from the two techniques for total percent cover and for the most common species. These models were then used to convert percent cover data to estimated point intercept data. Unfortunately, these conversions from percent cover to point intercept resulted in slight discrepancies between the estimate for total coverage and for each individual species.

The following water quality data was collected at all sites in conjunction with the plant surveys: water depth, salinity, and water clarity. Salinity samples were analyzed in the lab using a refractometer. Water clarity was determined using a 10cm diameter secchi disk.

Findings

All surveys collected to date are summarized in Appendix I. The name of each plant survey site begins with the two-letter abbreviation for the fish site followed by a number (e.g. HC-1, HC-2, etc.). The sites are numbered in order beginning with 1 at the fish sampling site and increasing downstream. All of the percent cover data collected using the visual percent cover method (from April 1996 to May 1999) was converted to approximate the results of the point intercept method by using simple regression models. The percent cover for less common species during this time period is included in the tables (bold and italicized), but it was not converted due to an insufficient number of data points to perform a regression analysis. Due to the timing and nature of this report, a complete statistical analysis of this data set is unavailable at this time. However, the following paragraphs discuss observed trends in the data and relate trends to the findings of similar studies.

The most common species at TR-1, JB-1, and HC-1 were Utricularia spp., Chara hornemanii, Ruppia maritima, Batophora oerstedi, Najas marina, and Cladophora spp. All three sites exhibited a dynamic community composition during the study period with all species varying in abundance both temporally and spatially.

TR-1 and HC-1 revealed similar patterns in total SAV abundance, with total abundance being inversely related to salinity. During the late dry season, total SAV was dramatically lower than during the wet season. The two dominate SAV species, Utricularia and Chara, appeared to be adversely affected by salinities greater than 5 ppt and 15 ppt, respectively. Similar studies performed in the mangrove ecotone indicated that Chara is most commonly found under brackish conditions (Tabb and Manning 1961; Montague et al. 1989, Morrison et al. 1997). Chara growth was found to be greatest when salinities were less than 15 ppt (Tabb and Manning 1961; Montague 1989). In a study of benthic vegetation in the mangrove lined lakes west of Taylor Slough, Morrison (1997) found that the abundance of Chara decreased when salinity ranged from 13-20 ppt. Utricularia, is a marsh plant predominantly found in freshwater habitats (Dressler et al. 1991).

For the most part, JB-1 exhibited the same seasonal patterns as TR-1 and HC-1 for Utricularia, Chara, and for total SAV abundance, with the exception that total SAV abundance did not decline during the 1997 dry season. This was due to the emergence of Cladophora, a filamentous green algae. Tabb and Manning (1961) observed Cladophora in Whitewater Bay at

salinities greater than 25 ppt. They noted that, with the onset of the wet season, Cladophora slowly died back and the abundance of Batophora increased (Tabb and Manning 1961). They speculated that Cladophora provides a suitable substrate for Batophora to colonize when it dies, since Batophora requires a hard substrate on which to grow. Batophora was observed growing on dead/dying Cladophora during the 1997 dry season plant surveys.

Unlike Utricularia and Chara, the abundance of Ruppia increased during the high salinity periods at the three upstream sites (TR-1, JB-1, HC-1). This was not unexpected since Ruppia has been identified as a brackish water seagrass that inhabits areas with high salinity fluctuations (McIvor et al. 1994). Tabb and Manning (1961) and Morrison (1997) observed increased Ruppia abundance at salinity ranges of 12-28 ppt and 14-23 ppt, respectively.

Changes in community composition occurred not only seasonally, but also spatially, based on site proximity to the marine environments of Florida Bay or Biscayne Bay. Along each longitudinal transect, the dominate species changed from freshwater to euryhaline to marine. The outermost sites at JB and HC were dominated by a euryhaline seagrass species, Halodule, while TR-6 was dominated by Thalassia testudinum and Halodule. Unlike the upstream sites, the majority of SAV communities at the outermost sites did not completely dieoff. At TR-6, the abundance of Thalassia decreased with salinity, but the abundance of Halodule increased at lower salinity. The data may indicate that the abundance of Thalassia may inhibit the growth of Halodule through resource competition: although a similar decrease in salinity occurred at HC-6 and JB-5&6 (Thalassia is absent from these sites) the abundance of Halodule decreased slightly instead of increasing.

The sampling sites at BS were very different from those located in northeastern Florida Bay due to lack of freshwater flow and tidal influence. There were no freshwater species present at BS and the communities were more stable, presumably due to the more stable salinity regime. The two uppermost sites were dominated by euryhaline species and both sites were vegetated throughout the year. BS-3 was a thick seagrass bed dominated by Thalassia and Halodule, and the outermost site, BS-4, was a hard bottom marine algae/seagrass community that did not resemble any of the other sampling sites.

Tabb and Manning (1961) observed a successional relationship between Chara, Ruppia, and Halodule wrightii with changes in salinity in northeast Whitewater Bay, Coot Bay, and the brackish and freshwater lakes to the north and east. Chara dominated the community at salinities

less than 15ppt, Ruppia dominated at salinities from 12-28 ppt, and Halodule dominated at salinities greater than 28 ppt (Tabb and Manning 1961). The mangrove transect sites appear to follow a similar successional pattern with the additions of Utricularia dominating at salinities less than 5 ppt and Thalassia dominating in high, stenohaline regions.

The preliminary results of this study coincide with the earlier findings of Montague and Ley (1993) which indicate that large, rapid fluctuations in salinity have an adverse effect on submerged aquatic vegetation within the mangrove ecotone of northeastern Florida Bay. These rapid changes do not allow successional changes in community composition to occur, leading to complete vegetation dieoffs (Montague and Ley 1993). Montague and Ley 1993 also indicated that barren bay-bottom areas are susceptible to wind events that can lead to turbid water conditions which can further hinder the reestablishment of SAV communities. Unvegetated areas were also found to have a negative impact on the amount of epifauna and benthic invertebrates at these sites, which leads to a decrease in both the quantity and quality of food for fish foraging in this habitat (Montague and Ley 1993). Studies have shown that vegetated areas provide shelter for small fishes (Rozas and Odum 1988) and have a higher abundance of invertebrate fauna than unvegetated areas (Gerking 1962; Menzie 1980; Crowder and Cooper 1982: Gilinsky 1984; Lubbers et al. 1990). Therefore, the fishes in unvegetated areas do not have optimal foraging conditions due to lack of available prey which could lead to lower productivity (Ley et al. 1994), thereby explaining the inverse relationship between salinity and fish biomass described in Appendix D.

OBJECTIVE 4: Examine the biology of the introduced Mayan cichlid (Cichlasoma urophthalmus) and the impact that this fish species has on the native community.

Background Information

The Mayan cichlid, Cichlasoma urophthalmus, is native to the Atlantic Slope drainages of Mexico's Río Coatzacoalcos basin southward to Nicaragua (Miller, 1966). The species is commercially exploited in freshwater, brackish, and marine environments throughout its range, and is preferred over exotic tilapias in local markets (Martinez-Palacios & Ross 1986, Flores Nava et al. 1989). Consequently, the Mayan cichlid is considered one of the most important and widely appreciated cichlids of the Central American region (Martinez-Palacios et al. 1990).

The Mayan cichlid was first collected in the United States in January 1983 within Everglades National Park, Florida (Loftus 1987). The population at the time was limited to an estuarine mangrove creek system east of Joe Bay (Snook Creek) and a freshwater habitat (Anhinga Trail) some 15 km from the coast (Loftus 1987, Figure 1). While the exact origin of these populations remains a mystery, Mayan cichlids were not collected at Anhinga Trail from 1976-1981, suggesting that the time of their discovery was made close to the time of their establishment (Loftus & Kushlan 1987, Loftus 1987).

From 1985 to 1996, the Mayan cichlid expanded its range to almost every available habitat of South Florida with varying success. To date, Mayan cichlids have been relatively unsuccessful at penetrating the freshwater marshes of the Everglades (Appendix L), however Mayan cichlids are one of the most abundant large-bodied fishes in the culvert pools and man-made canals of the region (Howard et al. 1995), and have comprised more than 90% of the total fish biomass in samples collected from estuarine mangrove habitats (Appendix C). Currently this species inhabits Florida waters in the area south of US Highway 41, from Chokoloskee to West Palm Beach and continues to predominate in freshwater canals and mangrove habitats (Shafland 1996, Jim Williams personal communication).

The proliferation of Mayan cichlids within Florida waters has economic and ecological importance. Because individuals up to 20 cm standard length are easily caught on hook and line, fight hard on light tackle, and have an attractive appearance, Mayan cichlids currently support a limited sport fishery (Shafland 1996). The abundance of this fish in areas previously utilized by native fishes has resulted in new interactions between native fishes and introduced Mayan cichlids that may result in profound alterations to the native community (Taylor et al. 1984).
Despite the importance of the Mayan cichlid in Central America and in Florida, there is little known about the basic life history of this species. The study of the Mayan cichlid was initiated in 1996 in response to a growing need for basic life history information on this prolific exotic fish. To date our research has focused on three major fronts; age and growth, reproduction, and trends in abundance. Included in this section are the synopsis of these three areas of research.

Findings

Age and growth. Introduced Mayan cichlids were collected monthly from March 1996 to October 1997 with hook-and-line gear at Taylor River, Florida. Their ages were determined

by examining thin sectioned otoliths. Marginal-increment analysis showed that opaque growth zones (rings) were annuli deposited on the otolith between January and May. Growth of Mayan cichlids was asymptotic and was modeled by the von Bertalanffy growth equation: L_t=191.96(1-exp[-0.32(t-0.27)]). The size of Mayan cichlids at age one was estimated at 33-66 mm standard length and was supported by monthly length-frequency data of young-of-year fish collected with drop traps over a seven year period. Mayan cichlids up to 6.8 years old were observed. The weight-length relationship for males and females were not significantly different; however males in the population were larger-at-age than females. Separate estimates of total annual mortality were relatively consistent (0.44-0.60) and indicate moderate mortality at higher age classes. Our data indicate that Mayan cichlids grew slower and lived longer in Florida than had been previously reported from native Mexican habitats. Because colder winter temperatures in Florida periodically slowed the growth of Mayan cichlids to produce visible annuli, it may be possible to similarly age introduced populations of other subtropical and tropical cichlids. A full analysis of this data and their respective discussions can be found in Appendix J.

Reproduction. We investigated the reproductive biology of the Mayan cichlid for twenty consecutive months in a southern Florida mangrove creek and compared it to that of available published accounts where this species is native. Mayan cichlid reproduction occurred during a period of the year when physical conditions facilitated the best growth and survival of the young, and was influenced more by changes in water level and salinity than by temperature. Most nests were observed along mangrove shorelines in April. The majority of reproduction and parental care of the young followed in May, and was completed by June when rising water levels flooded shallow habitats and dispersed young-of-year fish. Mayan cichlids in Florida became reproductively mature at a greater size than in native regions, but produced roughly the same number of eggs at a given body mass. The similarity of environmental conditions between southern Florida and areas where Mayan cichlids naturally occur imparts a very favorable reproductive potential (i.e., pre-adaptation: Taylor et al. 1984) for this species in southern Florida, and facilitates their continued presence within the ichthyofauna of the region. A full analysis of this data and their respective discussions can be found in Appendix K.

Trends in abundance. The percent contribution of the Mayan cichlid to the overall fish community in terms of number and biomass per sampling year is given **Figure 2**. During 1990-91 to 1995-96, the population of Mayan cichlids exhibited a "boom and bust" pattern of

abundance that is typical of newly established exotic species. What is interesting is that the population of Mayan cichlids underwent another rise in the overall contribution to the fish community during 1996-97 to 1998-99 rather than remaining low. Future efforts will focus on examining the mechanism responsible for Mayan cichlid abundance. Examination of other resident species as well as the trophic interactions between them will aid in these efforts. An account of Mayan cichlid population trends was submitted for publication as part of larger manuscript regarding population trends in introduced fishes in southern Florida (Appendix L).

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Table 1. Spoonbill nest numbers, location, and estimates of success for the 1998-99 nesting cycle. Success numbers in parentheses were estimates made from single visits to colonies. All others are from repeated surveys of marked nests.

Colony	**1st nesting**	**Success**	**2nd Nesting**	**Success**
Bottle	28	(0.40)	0	
Stake	0			
Cowpens	10			
Cotton	0			
West	0			
Low	0			
Pigeon	8	(0.75)		
Crab	7			
East	2			
Crane	11		0	
E. Butternut	4			
M. Butternut	47	(0.43)	0	
Total SE region	**117**		**0**	
E. Bob Allen	11	(0.36)	0	
Manatee	0			
Jimmie Channel	23	(0.27)	13	
S. Park	7			
Total Central Region	**41**		**13**	
Tern	60	0.40	208	2.04
N. Nest	0			
S. Nest	19	(0.32)	0	
Porjoe	9		2	
N Park	39		30	
Duck	9	0.44	7	(0.71)
Pass	0			
Total NE Region	**136**		**247**	
E. Buchanon	0			
W. Buchanon	0			
Barnes	0			
Twin	2			
Total SW Region	**2**			
Frank	125	(>1.0)	0	
Oyster	23			
Sandy	177	1.44	0	
Total NW region	**325**		**0**	
Florida Bay Total	**621**		**260**	

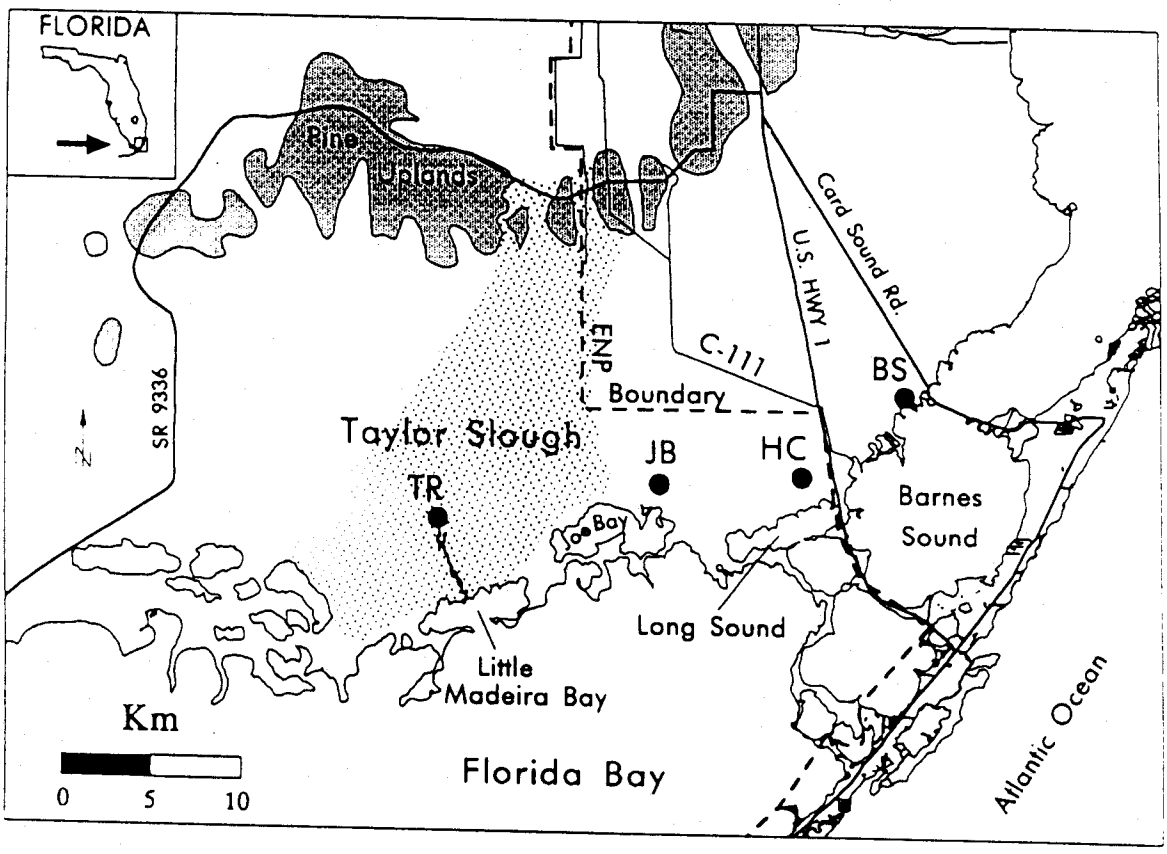


Figure 1. Map of southern Florida indicating the location of fish sampling sites.

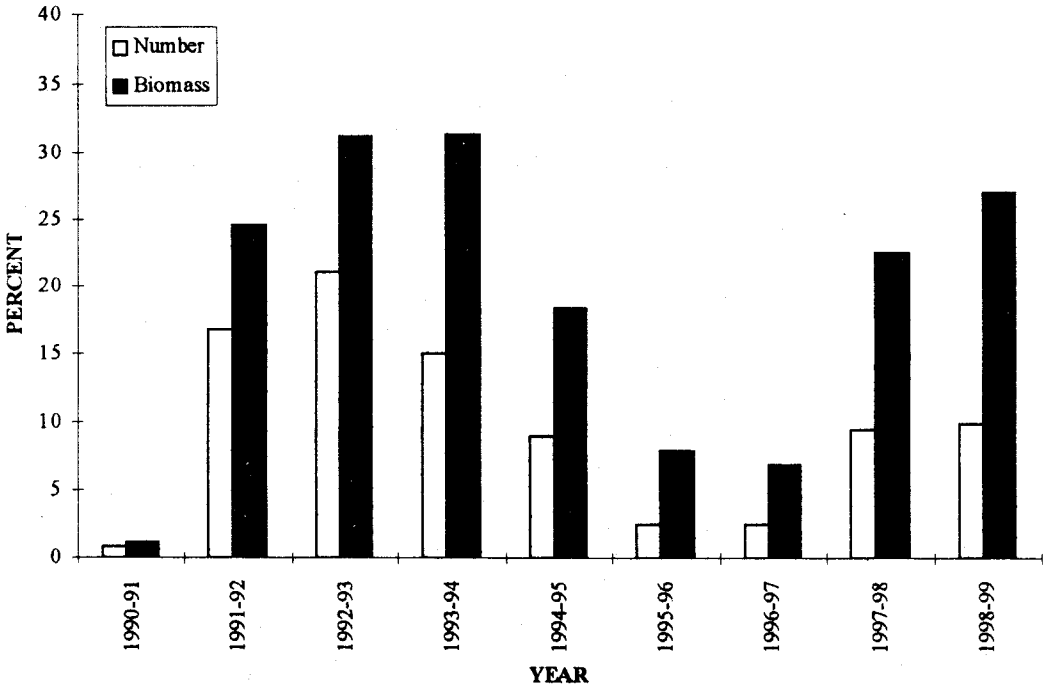


Figure 2. Annual percent catch by number and biomass for Mayan cichlids collected at mangrove sampling sites.

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Appendix A. A Drop Net and Removable Walkway Used to Quantitatively Sample Fishes Over Wetland Surfaces in the Dwarf Mangroves of the Southern Everglades

ABSTRACT

I describe a 9 m^2 drop net and removable walkways designed to quantify densities of small fishes in wetland habitats with low to moderate vegetation density. The method permits the collection of small, quantitative, discrete samples in ecologically sensitive areas by combining rapid net deployment from fixed sites with the carefully contained use of the fish toxicant rotenone. This method requires very little contact with the substrate, causes minimal alteration to the habitat being sampled, samples small fishes in an unbiased manner, and allows for differential sampling of microhabitats within a wetland. When used in dwarf red mangrove (Rhizophora mangle) habitat in southern Everglades National Park and adjacent areas (September 1990 to March 1993), high recovery efficiencies were achieved (78-90%) for five common species <110 mm in length. About 20,000 individuals of 26 species were captured. The most abundant fishes were sheepshead minnow Cyprinodon variegatus, goldspotted killifish Floridichthys carpio, rainwater killifish Lucania parva, sailfin molly Poecilia latipinna, and the exotic Mayan cichlid Cichlasoma urophthalmus. The 9 m^2 drop net and associated removable walkways are versatile and can be used in a variety of wetland types, including both interior and coastal wetlands with either herbaceous or woody vegetation.

INTRODUCTION

The dwarf mangrove-dominated zone that forms the interface between the Everglades and Florida Bay is an important area for wildlife in southern Florida. This brackish water zone is the habitat of a variety of endangered species, including the American crocodile and West Indian manatee (McIvor et al. 1994), and is heavily used as a feeding ground by several protected species of wading birds during their nesting period (Bjork and Powell 1993). Historically, fresh water from the Everglades reached the Florida Bay mangroves via sheet flow. However, the hydrology of the mangrove zone has been strongly affected in recent decades by the construction of roads, canals, and

levees upstream of Florida Bay (McIvor et al. 1994). There is considerable evidence that the ensuing changes in the quantity, quality, and timing of water deliveries dramatically altered the Florida Bay ecosystem, including the mangrove zone (McIvor et al. 1994). In 1989, sampling nekton over the surface of a dwarf mangrove forest was initiated to investigate the relationship between water deliveries and the composition of the fish populations that make up the prey base for larger vertebrates (e.g., game fishes, wading birds, crocodilians) to determine if recent changes in hydrology could have resulted in lower prey abundance, thereby eroding the food web from the bottom up.

Dwarf (or scrub) mangrove forests are only one of six mangrove community types described by Lugo and Snedaker (1974) and differ from most other forest types in having widely spaced trees without an interlacing, complex array of prop roots. The lack of a closed forest canopy and predominance of open space between trees in the dwarf mangrove forests made it possible for fish to easily perceive movement in the habitat. Fish were observed darting at the slightest movement, thereby causing us to underestimate densities made by any projectile trap. Similarly, fish tended to avoid a permanently placed but undeployed net that moved in the breeze. Fish maintained a close proximity to cover and, when startled, darted into the prop roots of the nearest mangrove. The substrate was very soft, unconsolidated carbonate marl covered by a 10-15 cm layer of light, flocculent, powdered marl. The bottom was easily disturbed; one person walking along the edge of a creek was enough to expose underground mangrove roots, and repeated excursions resulted in deep holes and permanent trenches. These and other unique characteristics of the study area had to be taken into account during the development of a sampling design.

Much of the problem associated with quantitative sampling of nekton on any wetland surface is identifying a gear type that will collect an unbiased sample without altering the habitat. Methods for sampling nekton previously designed for use in other wetland types were unsuited to the widely scattered single mangrove trees and easily disturbed marl sediments of dwarf mangrove forests of the southern Everglades. For example, block nets surrounding overwash mangrove isles (Morton 1990, Mullin 1995) and both flume nets (McIvor and Odum 1986) and flume weirs (Kneib 1991) used in vegetated intertidal marshes require a predictable tidal cycle not present in Northeast Florida Bay. Furthermore, the flume net is restricted to areas adjacent to permanent deep waterways, as is the 2.8 m^2 drop sampler described by Zimmerman et al. (1984) and Sheridan (1992). Although access to the dwarf mangrove zone was possible through permanent creeks, these collection devices could only sample creek and creek-edge microhabitats, leaving the microhabitat that dominated the area (i.e., the mangrove flats between the creeks) unsampled. Extrapolation of fish density estimates from creek-

edge habitats to the entire wetland is questionable because nekton may differentially orient to the creek/wetland interface (Peterson and Turner 1994, McIvor and Rozas 1996).

Throw traps (Chick et al. 1992) proved to be ineffective because traps large enough to enclose a dwarf mangrove tree were prohibitively too large to throw. Furthermore, throw traps used in open areas between trees failed to capture even individual fish that were targeted prior to throwing, presumably because the targeted specimen perceived and readily avoided the trap (personal observation).

Rozas (1992) developed a versatile and inexpensive 6 m^2 pull-up net that could be used in a variety of habitats, especially in moderately to heavily vegetated areas. However, excavations similar to those needed for the pull-up trap visibly altered the wetland surface by creating a new microhabitat type. During preliminary studies, burying the lead line of a block net resulted in a trench approximately 0.5 m wide and 0.3 m deep, over which floated newly exposed subterranean mangrove roots. This disturbance, exacerbated by repetition in sampling, created artificial habitat attractive to some fish species.

The unique structural features of this environment, combined with the special habitat value to a large and diversified guild of colonial wading birds (Bjork and Powell 1993) and other protected species, required that a new sampling device be developed that would (1) minimize permanent modifications of the substrate and thus preserve foraging habitat for wading birds; (2) sample microhabitats within the wetland system, i.e., flats as well as creek habitat; (3) sample within prop roots as well as open areas between plants; and (4) produce neither movements that would cause fish avoidance nor structure that might attract individual fishes. The 9 m^2 drop net described satisfies all these criteria.

MATERIALS AND METHODS

Study Area

Fishes were sampled at four sites in dwarf mangrove forests in the southern Everglades (Figure 3.1). Three sites were within the boundaries of Everglades National Park (ENP) and were located north of Little Madeira Bay on Taylor River (TR), north of the eastern end of Joe Bay (JB), and on a tributary east of Highway Creek (HC). The site outside the national park boundary was west of the northern end of Card Sound Bridge on Barnes Sound (BS). Each site was characterized by a deep central creek surrounded by extensive, shallow, inundated flats that become seasonally exposed.

Sites were characterized by widely-spaced dwarf red mangrove (Rhizophora mangle L.) trees with very little vegetation between individuals. Individual trees were separated by 0.5 to 3 m and varied from 0.5 to 2 m in height. Seasonal occurrences of the spike rush, Eleocharis sp., and of the calcareous macroalgae, Chara sp., were common, but neither taxa was abundant.

Water depth ranged from 15 cm to 65 cm in the creeks and from dry to 35 cm on the flats. Fluctuations in water level were seasonal, with the highest levels occurring in the wet season (May-October). During the dry season (November-April), water level was predominantly determined by wind-driven tides. Only one site (BS) was influenced by diurnal tides.

Salinity varied greatly within and between sites (Table 3.1). Although all sites fluctuated between fresh and hypersaline conditions, the mean salinity at each site indicated a west-to-east gradient of increasing salinity, a gradient that can be explained by the pattern of input of fresh water from the Everglades (McIvor et al. 1994). TR is located on the eastern edge of Taylor Slough (Figure 3.1), the central drainage basin for the Southeastern Everglades, and has the greatest amount of fresh water input of the sites. Of the two center sites, JB is closest to Taylor Slough and HC is further east (Figure 3.1) indicating that, historically, JB probably received more fresh water than HC. However, operation of southern Florida's extensive canal system has altered the distribution of fresh water flow and the two sites now have a relatively similar salinity regime. The eastern-most site, BS, is impounded by roadways that cut off the historic fresh water flow from the Everglades (Figure 3.1) and only received fresh water as localized rainfall. As a result, the site is most heavily influenced by tidal input from the marine environment of Barnes Sound.

Net Design and Site Preparation

Nylon parachute material treated with water-sealing vinyl paint was sewn to the lower portion of sampling nets (36 m X 1.8 m; 1.6-mm mesh) to ensure containment of the toxicant used to clear the net (Figure 3.2). The parachute cloth was about 75 cm deep and was attached to the net about 10 cm above the leadline. Canvas webbing (2.5-cm-wide strips) was used at the seams between the net and the parachute cloth to facilitate sewing. At the lower end of the net, the webbing was perforated every 3 cm along its length by burning small holes with a soldering iron. Five-cm-wide velcro strips were sewn to each terminal end of the net so that the ends could be fastened together, thereby forming an enclosure.

Nets were hung on square frames (3 m on each side) constructed of #3 steel reinforcement bar (1 cm diameter) with 3.0-cm (outside diameter) polyvinyl chloride (PVC) pipe uprights at each

corner (Figure 3.3). In constructing the frame, a loop was formed at both ends of each of the sides (hereafter called crossbars) by bending it around a 8.5-cm steel pipe. When installed at the sampling sites, these loops would loosely encircle the PVC supports (Figure 3.4). Cotter pins (15 cm long) were inserted through holes in each PVC support pole so that the crossbars were supported approximately 1 m above the surface of the water (Figure 3.3). Five 15-cm-long V-shaped wire prongs were attached at equal distances along the length of each crossbar, with the open end of the "V" turned upwards. The net frames surrounded an individual dwarf mangrove (Figure 3.5) and were left in place for the duration of the project.

Nets were moved from site to site and attached to the permanent frames. It took about 0.5 hrs to place the net on the frame. The float line was inserted through slots cut in the top of each PVC corner pole so that the float line hung loosely inside the frame (Figure 3.4A). To attach the net to the crossbars, the lower end of the net was lifted from under the crossbar and the holes in the webbing fitted over the outside arm of each of the V prongs (Figure 3.4B). The bulk of the net was then furled and cradled into the "V" of the upward turned prongs, thereby preventing it from blowing in the wind or touching the surface of the water (Figure 3.5A). This method of attachment causes a 10-cm skirt of net and leadline to remain free below the point of attachment of the net to the frame (Figure 3.5A). The nets were left in position overnight to ensure that disturbances caused during set-up were not a factor in the sample.

Nets were triggered from a distance of 4-5 m by lines attached to each of the four cotter pins (Figure 3.5A). When tripped, the steel crossbars drop, thereby forcing the lower end of the net to sink through the water very quickly and to settle onto the sediment, effectively trapping fish inside the net (Figure 3.5B and 3.5C). The 10-cm skirt with attached lead line prevented fish from escaping through any small depressions in the sediment.

Nets were triggered as early in the morning as possible (1-2.5 hours after sunrise) to control for possible diurnal variations in fish distributions. At that time of day, the shadows of the nets were long and appeared to be indistinguishable from those cast by nearby vegetation.

Nine nets were deployed at each site. Nets were arranged so that three nets were used in each of three microhabitats: creek, creek-flats interface, and flats. Samples were collected at HC and JB starting in September 1990. TR was first sampled in December 1991, and the sampling began at BS in February 1992. Results are presented through March 1993.

Net-Clearing Procedure

Powdered rotenone was first dissolved in water from the site to make a concentrated slurry. This slurry was added to the enclosed area at a final target concentration of 1 ppm active ingredient. Powdered rotenone was chosen instead of emulsified rotenone to avoid the adverse effects to non-target invertebrates that is frequently seen with emulsified rotenone (Gilmore et al. 1981). To ensure that the 1-ppm dose was effective, standard wire minnow traps (placed near each net during set up) were used to collect fish from the vicinity. Three to five fish of various species were marked by clipping the caudal fin (in case of escape) and placed in a minnow trap inside the net before rotenone application (Figure 3.5C). These trapped fish tested the effectiveness of the rotenone application; if the indicator fish were not dead 30 min after application, more rotenone was added. No dead or dying fish observed outside the nets after rotenone application indicated that the water-proofed parachute cloth prevented rotenone from escaping from the net, thus ensuring an accurate 1-ppm dose of the toxicant. Furthermore, periodic use of dyes mixed with the rotenone indicated that nets showed no signs of leakage even after several months of field sampling.

Dead and dying fish were collected with a dip net from inside the net after rotenone application (Figure 3.5B). After 15-30 min, fish stopped surfacing, and the interior of the net was treated with a dose of potassium permanganate ($KMnO_4$) four times that of the rotenone to neutralize the toxicant (Lawrence 1956). Each net was then covered with a 3-cm-mesh nylon net to prevent avian predators from eating uncollected specimens.

In most cases, all of the remaining uncollected fish floated to the surface after 24 hours. Because the exact time it takes for dead fish to float is dependent on water temperature (Parker 1970), it was necessary to use float indicators. The fish placed in the minnow trap to test rotenone effectiveness were left in the minnow trap overnight. When 95% of these fish floated, the final collection was made. During the final collection, water inside the net was stirred and the flocculent marl layer gently agitated with a plastic rake to loosen fish that may have burrowed or been trapped beneath submerged objects before death. After the final collection was completed, the nets were removed from the frame.

Walkways

Where water depth permitted, all of the activities (setting-up, deployment, clearing and take down) were done from small aluminum jon boats to avoid altering the sediments and causing associated biases. Unfortunately, mangrove flats could not be reached by boat because the individual

dwarf mangroves were too close together and the water too shallow. As a consequence, a system of boardwalks and removable walkways was developed to access these areas.

Boardwalks of various lengths were installed from the edge of the creek to within 3 m of the net site. Removable walkways were used to access the net frames from the boardwalk because placing boardwalks permanently around the nets would have created an artificial attractant to fish, thus biasing the flats samples. Walkways were constructed of three 3.3-m lengths of 4-cm-diameter, galvanized chain link fence toprail pipes attached lengthwise to 3.3 m x 35 cm strips of 1.3-cm-thick plywood (Figure 3.5D). The toprail pipes were attached to the wood using galvanized screws that would act as sacrificial anodes (i.e., the screws would oxidize leaving the pipe structurally sound). As a result, screws had to be occasionally replaced over the course of the study. Because deployment of these walkways would damage the substrate, wooden supports (4x9 cm) were hammered down to limestone bedrock and cut so that a 30-cm-long wooden cross beam attached to each pair of supports would lie just below the sediment surface. Each walkway required 3 supports (15 per net). The hollow fence toprail allowed the walkways to float when first placed in the water, providing time to maneuver them into position around the net. As water filled the pipes, the walkways sank, settling on the supports. After the nets were set up, the walkways were easily removed, and no sediment damage was apparent the following day. The nets were triggered from the end of the boardwalk, and the walkways were again set in place so that fish could be removed from the net (Figure 3.5).

Bias Test

Bias was tested for (fish avoidance or attraction to nets) through direct observation. Bias tests were performed at the HC site because water clarity was excellent, thus allowing visual identification and consistent counts of fish. Tests were performed on ten dates between June 10, 1990 and July 6, 1990. Two 1 m^2 plots, approximately 3 m apart, were marked off using small (<2.0 cm^2) styrofoam floats anchored to the sediment. A 9 m^2 frame and undeployed net were set up around one of the plots. The other was the control. A stepladder was placed midway between the two plots as an observation post. To facilitate observations, the trap was set so that the 1 m^2 plot fell along the outer edge of the trap closest to the observation point. Since any attraction to or avoidance of the trap by fishes would be expected to occur along the periphery of the trap, placement of the 1 m^2 observation area along the periphery of the trap also insured that differences in fish use would be quantified. After a 15-minute acclimation period, the species and number of fish inside both plots were recorded. Counts were made every 3 minutes for a total of one hour (20 observations). Upon

completion of the first hour, the control and the experimental plots were switched (i.e., the frame and net were moved to enclose the m^2 plot that served as the control in the first set of observations). The observation process was then repeated.

No more than 2 hours of observations were made on any day for a total of 4 hours per day (2 hours control and 2 hours experimental). Preliminary tests determined that fish did not respond to the long shadows cast by the net and observer shortly after sunrise as opposed to later in the day when fish were observed to react to more strongly defined shadows. As a result, observations were performed in the first four hrs following sunrise, and deployment of nets was restricted to the first 3 hours after sunrise for the duration of the study.

Since individual fish could remain in the plot for two or more consecutive observations, each observation could not be considered independent. For this reason, an average number for each species was calculated from each hour of data (i.e., each hour of observation generated two data points, one for the control plot and one for the experimental plot, for each species). These averages were analyzed using a two-tailed paired t-test for each species. The null hypothesis was no significant difference in the number of fish (total and individual species) between the area under the undeployed net and an adjacent area without a net. Because of greater concerns about making a Type II error (accepting the null hypothesis when it was false), alpha was set at 0.15 instead of the "traditional" 0.05 in an attempt to balance Type I and Type II error rates (Sokal and Rohlf 1981).

Clearing Efficiency Tests

The effectiveness of the clearing procedure was periodically tested by a second set of indicator fish. Fish of all species captured in minnow traps were marked (caudal fin diagonally clipped) and released directly into the enclosed area after the nets had been triggered. The ratio of fish recovered to fish released provided a measure of net clearing efficiency.

Recolonization of Sampling Area

To demonstrate that application of rotenone and $KMnO_4$ had only short-term impacts on fish distribution, overnight recolonization of the sampling areas was examined. Three traps were collected on successive dates at the BS site during two sampling periods (October and December 1994). Traps were triggered and treated with rotenone followed by $KMnO_4$. After about six hours, the traps were reset. The following morning, the traps were triggered and a second collection made.

RESULTS

Approximately 20,000 individuals of 26 fish species were collected in 548 samples (Table 3.2), giving an average estimated density of 4.09 fish/m^2. The most abundant species were rainwater killifish Lucania parva, sheepshead minnow Cyprinodon variegatus, Mayan cichlid Cichlasoma urophthalmus, and sailfin molly Poecilia latipinna. With the exception of the Mayan cichlid, which was not collected at Barnes Sound, these species occurred at all four sites.

The fauna is further characterized as almost totally estuarine resident species: juveniles of estuarine transient species often found in mangrove forests were poorly represented in the dwarf red mangrove forests in southeast Florida. Adults of transient species were frequently observed in the deepest open water areas and were probably too mobile to be collected with this method. A second noteworthy feature of the fauna was the frequent occurrence of individuals of non-native species, in particular, the Mayan cichlid. This exotic species was very abundant at Taylor River where it made up nearly 30% of the catch; it was also common at Joe Bay and Highway Creek (Table 3.2).

Bias Test

The bias test indicated that no significant differences occurred between the control and the experimental plots for any species or total number of fish. The results of the two-tailed paired t-test on 20 hours of observation (Table 3.3) indicated nets had no significant effect on the distribution of fish in the sample area and that the presence of the net did not cause a bias in the density estimates.

Clearing Efficiency Tests

Net clearing efficiencies ranged between 78% and 90% for the most common fish species. The average rate for all marked and released fish was 86% (Table 4).

Recolonization of Sampling Area

Table 5 compares the species and number of fish collected from the same trap on consecutive days. Results clearly show that the trap area was recolonized after less than a 24-hr period.

DISCUSSION

The dominance of euryhaline specialists (Table 3.2) is a likely reflection of the wide range of salinities experienced at each site (Table 3.1). However, an examination of the less common fauna at the sites reflects the east-west gradient in mean salinity of the study area. The presence of sunfishes

Lepomis spp. (Loftus and Kushlan 1987) and spotted tilapia Tilapia mariae (Courtenay et al. 1984), and the high percentage of Mayan cichlids (Martinez-Palacios and Ross 1992) reflects the low mean salinity at Taylor River. At Barnes Sound, the site with highest mean salinity (Table 3.1), these species were absent from the fauna, and two euryhaline species reported as being most commonly found in medium and low salinities were underrepresented: marsh killifish Fundulus confluentus (Lee et al. 1980) and diamond killifish Adinia xenica (Foster 1967). Additionally, typically marine species made up a comparatively large percentage of the catch at Barnes Sound: goldspotted killifish Floridichthys carpio (Foster 1967), tidewater silverside Menidia peninsulae (Robins et al. 1986), gulf toadfish Opsanus beta (Robins et al. 1986), and mojarras Gerridae (Robins et al. 1986). Described as euryhaline species, the sheepshead minnow (Loftus and Kushlan 1987), gulf killifish Fundulus grandis (Loftus and Kushlan 1987), diamond killifish (Foster 1967), and marsh killifish (Lee et al. 1980) made up more of the catch at Joe Bay and Highway Creek than at either of the sites at the salinity extremes. Additionally, the above-mentioned marine and freshwater associates made up a smaller percentage at these two sites than at Barnes Sound and Taylor River, respectively.

Efficiency estimates for the 9 m^2 drop net (78-90%) compare favorably with those for flume nets (53-80%; McIvor and Odum 1986) and the bottomless lift net (58-93%; Rozas 1992) in coastal marshes, and for a throw trap (93-100%) in a tidal creek containing submerged vegetation (Rozas and Odum 1987). Clearing efficiency estimates greatly exceed those previously reported for rotenone in tidal marsh creeks (29-58%) (Weinstein and Davis 1980) or for the capture of similar-sized fishes from fringing red mangrove shoreline using larger block nets cleared with rotenone (36-68%, Ley 1992; 33-88%, Thayer et al. 1987). The greater efficiency with rotenone may be attributed to the containment of toxicant inside the net by the parachute cloth, thereby ensuring an accurate and undiluted dose. Additionally, the relatively small sampling area allows the researcher to view and collect from all parts of the net from any position around the perimeter.

The protocol described herein differs from previous net designs in two primary ways: (1) it combines the best mechanical features of a drop trap (remote triggering of a rapidly falling fixed frame and net) with the (2) fast-acting immobilizing features of the chemical rotenone. Further, by effectively containing the fish toxicant within the 9 m^2 sample area and using fish constrained within minnow traps placed within the drop net as indicators of rotenone effectiveness, it is possible to obtain precise estimates of fish density for fishes < ca 110 mm TL.

The accuracy of this method in estimating densities of fishes in mangrove prop roots was not directly tested. Visual counts similar to the bias tests were performed before nets were triggered, but the these counts always significantly underestimated the rotenone collection, even when the test was

conducted over non-vegetated areas. This discrepancy was probably due to the cryptic coloration and burrowing habits of the resident fish species. The method described appears to be accurate because it does not affect the overall distribution of fish and because fish trapped within the net are efficiently collected. An additional but unknown source of sampling error would be fish escaping from the target area between the time the pins are pulled and the time the net settles into the bottom. At the mangrove sampling sites, this factor is probably only a minor source of error because fish inside the net perimeter were observed to flee away from the disturbance caused by the falling net and toward the refuge of the enclosed mangrove while fish outside the perimeter would move away from the falling net. Similar responses would be expected in any vegetated wetland. Furthermore, the weight of the reinforcement bar results in the net quickly settling to the bottom.

Our sampling technique has many of the same advantages discussed by Rozas (1992) for the 6 m^2 lift net. The 9 m^2 drop net does not significantly damage nor alter the habitat like throw traps (Kushlan 1981) and pull-up traps (Higer and Kolipinski 1967). Gentle use of the garden rake to dislodge fishes trapped within the sample area redistributed mangrove detritus but did not uncover mangrove roots or uproot infrequent herbaceous vegetation. The drop net does not impede the movements of those organisms to be sampled (McIvor and Odum 1986, Hettler 1989), nor is it limited to areas accessible by creeks or open water (Zimmerman et. al. 1984). Sampling sites can be selected anywhere accessible by a boardwalk, so differential use of wetland microhabitats can be quantified.

Compared to Rozas' (1992) lift net, the drop net has the advantage of not appreciably altering the wetland surface. Repeated excavations such as those described by Rozas (1992) to bury the lift net would create progressively deeper and wider trenches on the sites. Furthermore, since the nets are removed and inspected after each sample, net damage is less likely to occur and more likely to be seen and repaired. Another advantage is that the lift net (Rozas 1992) requires two people to deploy, whereas the drop net only needs one. Also, the overall collection efficiency was somewhat lower for the pull-up net than for the 9 m^2 drop net in the habitats tested. Finally, Rozas' (1992) method requires a predictable tide to clear the net, whereas the net described herein can be used whether or not the wetland is predictably tidal. Thus, the 9 m^2 drop net could be effectively used in fresh water wetlands as well.

A drawback of the 9 m^2 drop net is that it requires visiting a site on 3 consecutive days to completely collect a sample. Also, when powdered rotenone is used to clear the net in nontidal environments, the drop net cannot be used to sample crustaceans or other invertebrates because these

organisms are either not killed by the rotenone concentrations used for fish (Gilmore et al. 1981), or they remained buried in the sediment.

Use of the method in mangrove community types other than dwarf forests would require variable amounts of habitat modification. Specifically, prop roots or pneumatophores would initially have to be cut to permit the net to fall freely. Such initial site preparation was necessary to use a 2.8 m^2 drop trap in dense red mangroves that fringed shorelines in Rookery Bay, FL (Sheridan 1992).

Use of fish toxicants is an accepted method of collecting fishes for scientific study (Davies and Shelton 1983). In this particular case, every effort was made to ensure that rotenone and $KMnO_4$ were contained and detoxified within the nets so that no unintentional damage was done to this environmentally sensitive area. The water-proof cloth barrier around the lower section of the net was specifically designed to prevent the kill of non-target fishes outside the netted area. Further, a large mesh (ca. 3cm) nylon net was used to cover each net between the initial and second day collection to prevent nesting birds from foraging on floating fish and thereby potentially carrying the toxicant back to their young. The application of $KMnO_4$ ensured that no active rotenone would be released into the environment when the net was removed (Lawrence 1956, Davies and Shelton 1981). The 24-hr period between application of $KMnO_4$ and net removal further ensured the oxidation of rotenone and the reduction of $KMnO_4$. The success of these precautions for fish was evident from a complete lack of observed bykill or aberrant behavior of fishes outside the net. Furthermore, samples collected from the same traps on consecutive dates indicated that fishes used the trap area less than 24 hrs after the nets were raised and chemicals allowed to diffuse without any apparent ill effects . As in most other fish studies, impacts on invertebrates or of fishes eating invertebrates killed or impaired by rotenone or potassium permanganate remain uninvestigated.

A common criticism of repeatedly sampling the same area is that the organisms removed may result in depletion in the overall community or localized extirpation of populations. This situation would bias any statistical analyses applied to the data set. Such was not the case for fishes in the dwarf mangrove forests. Consideration of the scale of the watersheds being sampled indicates that an insignificant number of fish were removed to affect the local population. The smallest watershed (Barnes Sound) was conservatively estimated to have a wetted area of 375,000 m^2. The 81 m^2 sampled every four to six weeks made up about 0.02% of the habitat available to the target species. Hypothetically, if fish were distributed uniformly and no recruitment or mortality occurred, it would take more than 20 years of sampling once a month before even a 5% reduction in the community would be seen using this method. Further evidence of the negligible impact of sampling on the community comes from the quick recolonization of sampled areas. Fish were observed to

enter the sampled area almost immediately after the nets were removed, and traps collected on consecutive days indicated that fishes were using the trap area less than 24 hrs after the nets were raised. Although there were some differences in the composition of the community on consecutive days, this difference appears to fall within the normal variance of the community structure. Also, the variability in the community composition between samples follows a wet season/dry season oscillation in density and biomass that is typical of many pulsed ecosystems (Odum et al. 1995). For these reasons, individual samples can be considered independent of one another through time, (i.e., samples had no tangible impact on subsequent collections). Time and cost estimates to build and deploy nets are moderate. It takes one person about one day to assemble each net. The cost of an individual net ($US in 1996) is ca. $225.00 (professional sewing included) if six or more nets are made. Each frame costs about $20 and about 3-4 hrs to prepare and set up on site. Walkways cost about $30 each ($150 per net) and 0.5 hrs to assemble. The cost of the walkway supports depends on the type and depth of sediment. More detailed information about costs, products, suppliers, or specific assembly techniques is available from the first author.

In summary, the method described requires very little contact with the substrate, does not appreciably alter the habitat being sampled, does not alter the distribution of fishes in the general sample area, avoids undesirable kills outside the confined sample area, and allows sampling of microhabitats within wetlands. Because of these combined features, this method offers a unique approach to estimating fish densities in wetlands favorable to its use. The 9 m^2 drop net is another alternative in the growing list of methodologies for sampling fishes in both coastal and inland wetland habitats.

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Table A.1 Salinity profile of sampling sites. Mean, minimum (MIN), and maximum (MAX) are in parts per thousand. STD ERR is the standard error of the mean, and "n" is the number of salinity samples collected. Salinity samples were collected on the same day that fish were sampled using a salinity meter and an optical refractometer.

SITE	MEAN	STD ERR	n	MIN	MAX
TR	5.12	2.86	16	0	41
JB	12.38	2.67	28	0	42
HC	10.72	2.26	28	0	43
BS	20.56	3.17	14	3	39

Table A.2 Fish species collected at four dwarf red mangrove sites in South Florida. Site abbreviations as in text. Numbers are percent of total catch at each site. Tot is the percent of catch for all sites combined. Exotic species (E) and species exclusively represented by juveniles (J) are indicated after the generic name. Species are listed in phylogenetic order.

Family Genus species	Common Name	TR %	JB %	HC %	BS %	Tot %
Ictaluridae						
Ameiurus natalis (Lesueur)	yellow bullhead		0.01			<0.01
Clariidae						
Clarias batrachus (Linnaeus) (E)	walking catfish		0.01	0.03		0.02
Batrachoididae						
Opsanus beta (Goode and Bean) (J)	gulf toadfish		0.03	0.02	0.41	0.08
Atherinidae						
Menidia peninsulae (Goode and Bean)	tidewater silverside	0.93	2.93	0.94	8.58	2.90
Belonidae						
Strongylura notata (Poey)	redfin needlefish	0.06	0.08	0.05	0.13	0.07
Cyprinodontidae						
Adinia xenica (Jordan and Gilbert)	diamond killifish		0.21	1.32	0.03	0.52
Cyprinodon variegatus Lacepede	sheepshead minnow	3.76	20.61	35.27	11.21	20.70
Floridichthys carpio (Gunther)	goldspotted killifish	2.14	3.14	13.01	22.25	8.88
Fundulus chrysotus (Gunther)	golden topminnow		0.01			<0.01
F. confluentus Goode and Bean	marsh killifish	0.12	2.48	4.93	0.03	2.43
F. grandis Baird and Girard	gulf killifish	0.30	4.36	12.54	2.69	5.85
F. similis (Baird and Girard)	longnose killifish	0.12	0.43	1.32	1.55	0.82
Jordanella floridae Goode and Bean	Florida flagfish		0.01			<0.01
Lucania parva (Baird and Girard)	rainwater killifish	32.36	28.98	12.49	13.74	22.28
Poeciliidae						
Belonesox belizanus Kner (E)	pike killifish	0.18	0.35	0.07	0.03	0.19
Gambusia holbrooki Girard	mosquitofish		1.72	0.39	0.60	0.87
Poecilia latipinna (Lesueur)	sailfin molly	8.00	13.17	12.09	12.60	11.91
Syngnathidae						
Syngnathus louisianae Gunther	chain pipefish				0.16	0.03
Gerreidae						
Eucinostomus sp	mojarras	0.03	0.08	0.03	5.79	0.95
Gobiidae						
Lophogobius cyprinoides (Pallas)	crested goby	4.27	0.01			0.71
Microgobius gulosus (Girard)	clown goby	16.03	2.40	0.47	20.07	6.84
Centrarchidae						
Lepomis spp. (J)	sunfish species	1.56	0.83	0.02		0.58
Cichlidae						
Cichlasoma bimaculatum (Linnaeus) (E)	black acara		0.01			<0.01
C. urophthalmus (Gunther) (E)	Mayan cichlid	29.83	17.99	4.84		13.24
Tilapia mariae (Boulenger) (E)	spotted tilapia	0.30	0.14			0.11
Soleidae						
Trinectes maculatus (Bloch and Schneider)	hogchoker		0.03		0.09	0.03
TOTAL NUMBER FISH COLLECTED		3325	7744	5965	3159	20193
NUMBER OF NETS SAMPLED		99	183	172	94	548
NUMBER OF DATES SAMPLED		13	25	25	11	74

Table A.3 Mean number (± 1 S.E.) of fish per square meter in paired experimental (w/ net) and control (w/o net) plots, the differences between the two (w/ - w/o), and the results of a paired t-test performed for each species and for the total count. Twenty hourly means were used to generate the overall means used in this analysis (n=20 pairs).

Species	Mean #/m2 w/ net	Mean #/m2 w/o net	Difference w/ - w/o	Paired-t value	P (2-tail)
Cyprinodon variegatus	19.50 (4.94)	20.19 (4.96)	-0.69	-0.491	0.63
Fundulus confluentus	5.43 (1.71)	4.30 (1.24)	1.12	1.298	0.21
Poecilia latipinna	0.61 (0.23)	0.62 (0.20)	-0.01	-0.103	0.92
Menidia peninsulae	2.16 (0.85)	2.57 (1.04)	-0.41	-0.531	0.60
Fundulus grandis	0.17 (0.06)	0.23 (0.04)	-0.06	-1.201	0.24
Fundulus similis	0.36 (0.11)	0.22 (0.08)	0.13	1.205	0.24
Strongylura marina	0.10 (0.22)	0.16 (0.05)	-0.06	-1.397	0.18
Total	28.40 (6.45)	28.62 (5.88)	-0.22	-0.124	0.90

Table A.4 Results of clearing efficiency tests for the five most frequently used species.

SPECIES	SIZE RANGE (mm)	TOTAL FISH	TOTAL NETS	EFFICIENCY (%±SE)
Cyprinodon variegatus	20-40	521	175	87 ± 2.1
Cichlasoma urophthalmus	20-70	609	141	87 ± 2.3
Fundulus grandis	35-110	279	132	90 ± 2.4
Lucania parva	15-25	216	115	78 ± 3.6
Poecilia latipinna	20-45	169	96	88 ± 2.8
Total all fish	15-120	2301	324	86 ± 1.1

Table A.5 Number of fish per species collected on consecutive days at BS in the flats microhabitat.

Date	Species	Net F1		Net F2		Net F3		Total	
		Day1	Day2	Day1	Day2	Day1	Day2	Day1	Day2
Oct 94	Floridichthys carpio	0	2	11	7	3	8	14	17
	Lucania parva	0	1	6	3	3	6	9	10
	Microgobius gulosus	0	3	16	1	13	0	29	4
	Gerreidae spp.	0	16	0	11	0	2	0	28
	Menidia peninsulae	3	0	4	0	0	0	7	0
	Poecilia latipinna	0	0	0	0	1	0	1	0
	Cyprinodon variegatus	0	0	0	0	2	0	2	0
	Fundulus confluentus	0	0	0	0	1	0	1	0
	TOTAL	3	22	37	22	23	16	63	59
Dec 94	Floridichthys carpio	4	14	8	15	16	11	28	40
	Lucania parva	2	1	2	2	4	0	8	3
	Microgobius gulosus	7	1	2	5	4	1	13	7
	Greedier spp.	0	7	0	4	0	13	0	24
	Menidia peninsulae	0	0	0	2	0	2	0	4
	Gambusia holbrooki	0	0	0	1	1	0	1	1
	TOTAL	13	23	12	29	25	27	50	79

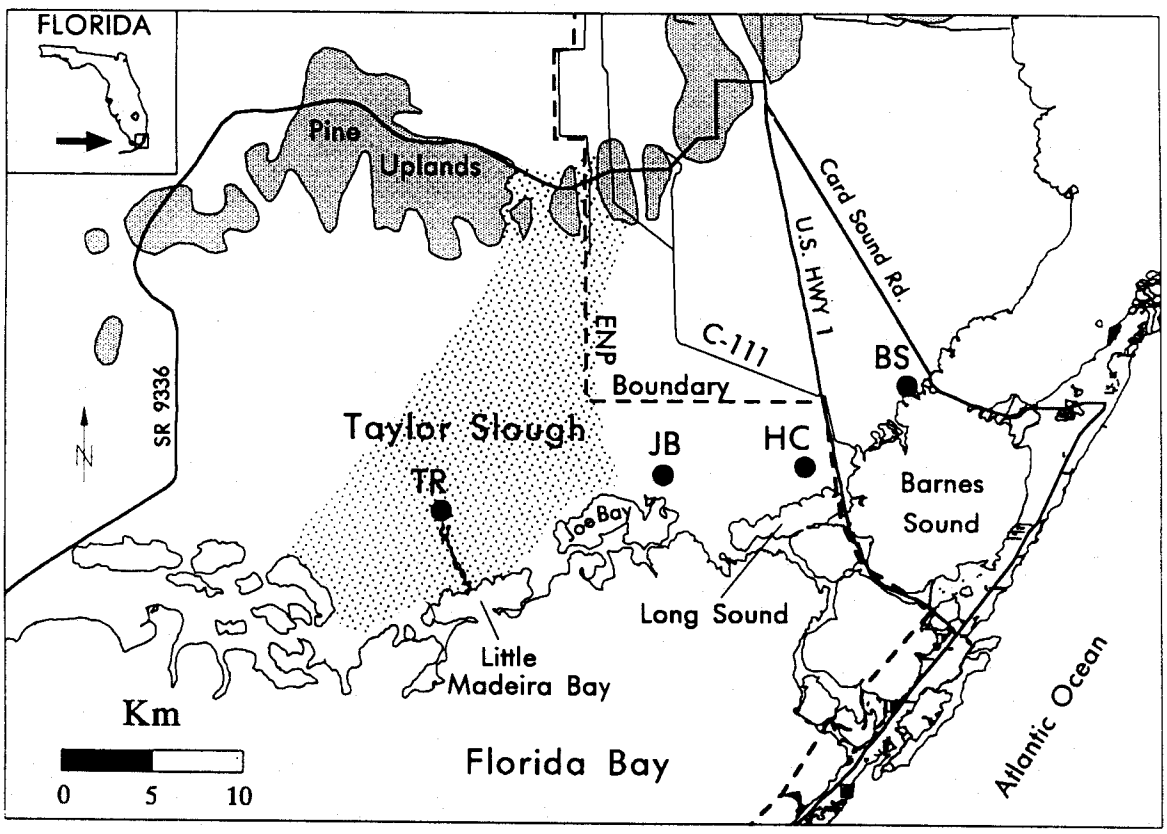


Figure A.1 Map of southeastern tip of Florida, USA indicating the location of sites and pertinent topographical features. Sampling sites were Taylor River (TR), Joe Bay (JB), Highway Creek (HC) and Barnes Sound (BS).

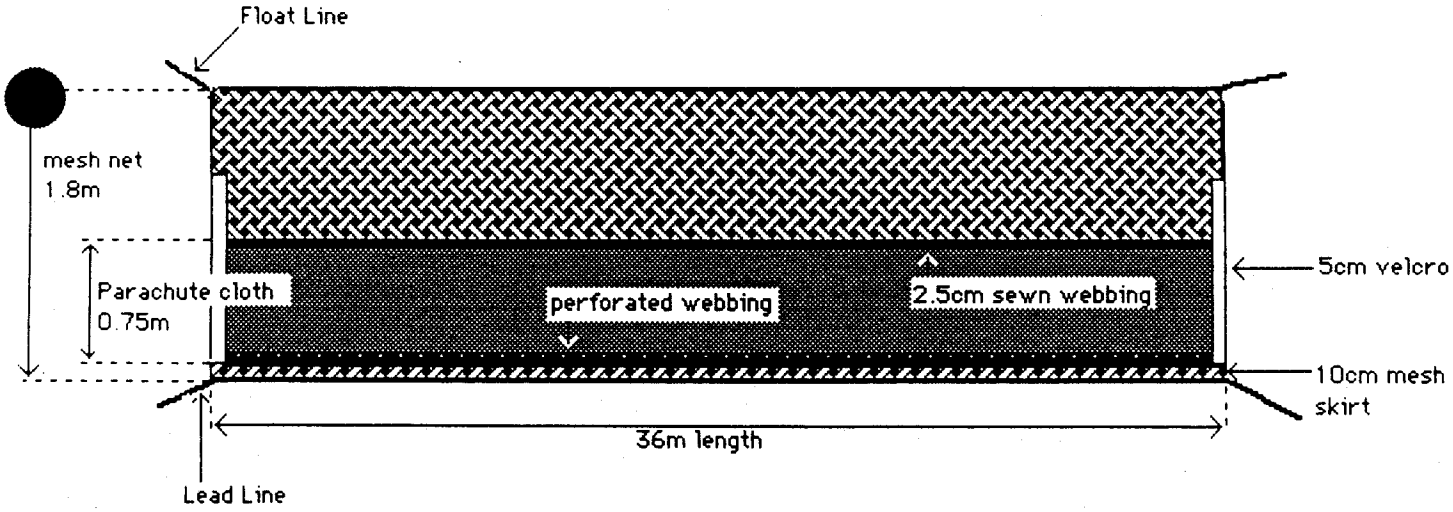


Figure A.2 Diagram indicating the various components of the net.

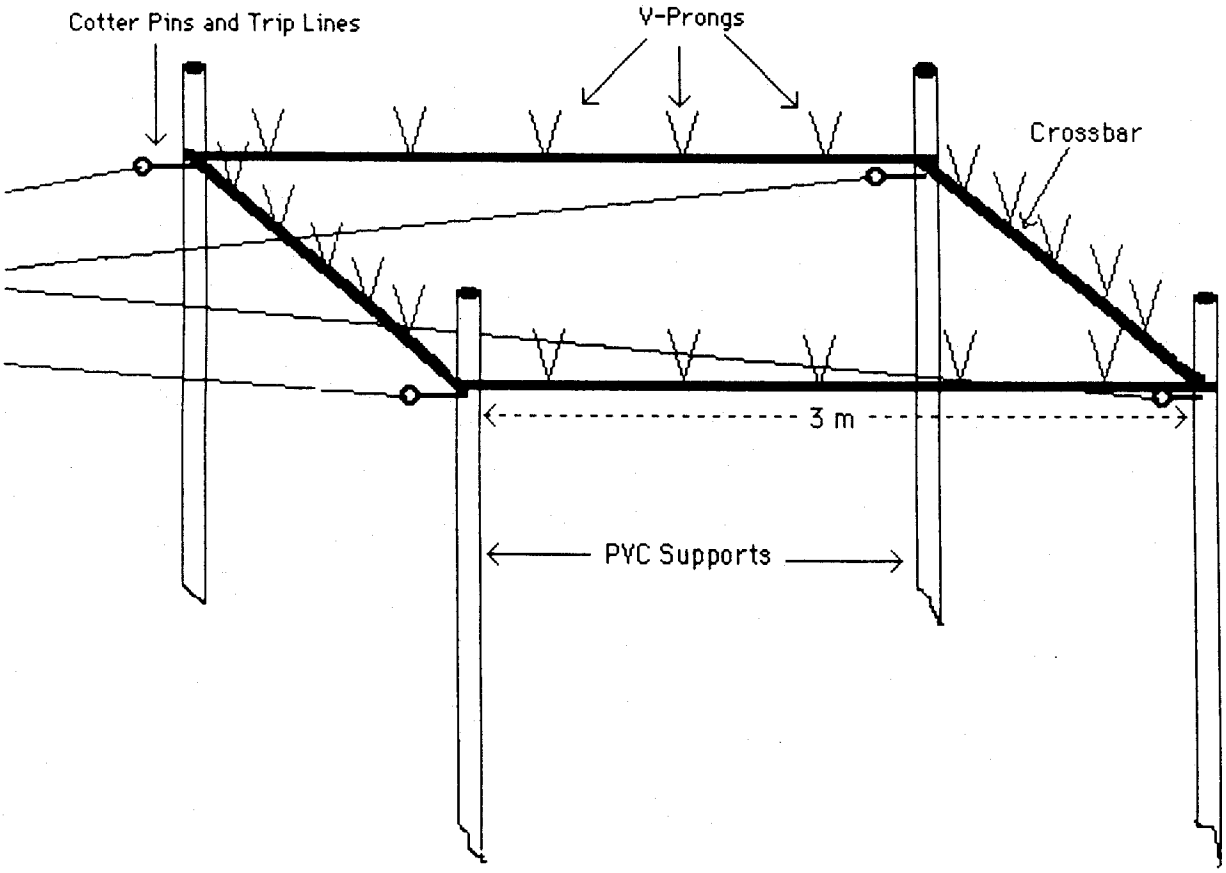


Figure A.3 Diagram indicating the various components of the net frame.

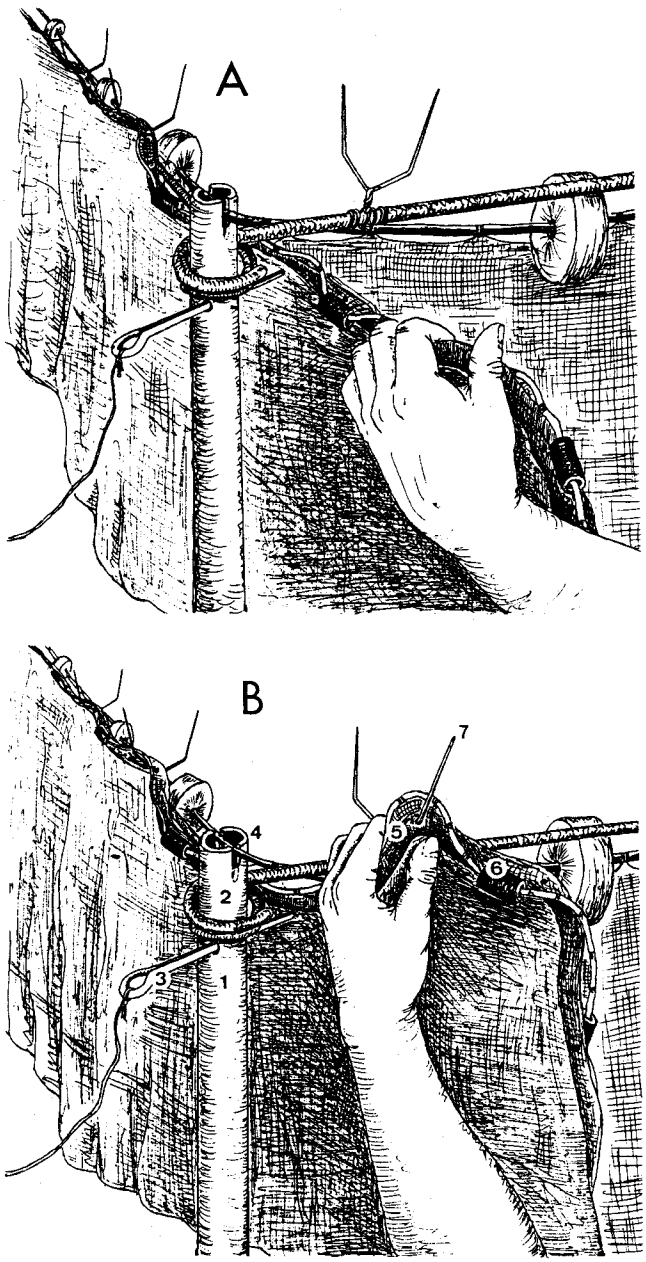


Figure A.4 Details of corner supports, crossbars, and net attachment. (A) The float line is suspended from the corner supports so that the net hangs to the inside of the frame. (B) The bottom of the net is lifted from under the crossbars and attached to the outer arm of the V-staples. Net components: 1) PVC corner support, 2) reinforcement bar crosspiece encircling PVC corner support, 3) Cotter pin and pull line, 4) Float line inserted through slot in PVC support, 5) perforated canvas webbing, 6) leadline (note that 10 cm skirt is not apparent in this drawing), 7) V-prongs.

A



B

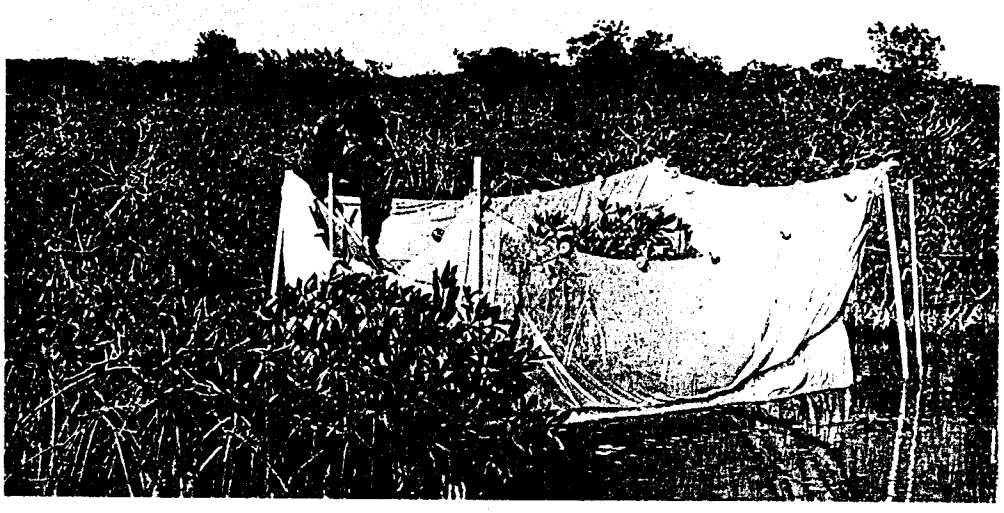


Figure A.5 Deployment of the 9 m^2 drop net. A) First author preparing to trigger a net from the end of a boardwalk. B) Deployed net being cleared from removable walkways. C) Deployed net enclosing a dwarf mangrove tree. D) Installation of portable walkways clearly showing the basic design.

C



D



Figure A.5. (cont)

Organization of Tables in Appendix B.

Appendix B. provides numerical data for each fish collection. This appendix is organized chronologically by month with the sites presented in alphabetical order (e.g. June 1995 was the first sample collected so the first table summarizes the June 1995 collection at BS, followed by summary tables for the June 1995 collections at HC, JB and TR). Each table lists numbers of fish collected on an individual sample date. Species are listed in order of decreasing abundance. The columns headed 'NET 4', 'NET 5' and 'NET 6' summarize the data from individual drop traps from creek micro-habitat. The 'DEEP' column sums these three nets. The columns headed 'NET 10', 'NET 11', and 'NET 12' summarize the data from individual drop traps from flats micro-habitat. The 'FLATS' column sums these three nets. The 'TOTAL' column sums all 6 nets. In cases where nets were not sampled due to technical problems, the column for that net indicates 'NET NOT SAMPLED.' Similarly, if the nets were not sampled because they were dry, the column indicates 'NET DRY.' The number of nets sampled are summarized in the upper right corner. Physicochemical parameters and the date of collection are also located in the upper right below the net summary. 'Temp' indicates the temperature when traps were triggered. 'Salin' indicates the average salinity for the day from data recorders. 'Depth' indicates the mean daily depth on the flats as recorded by the Telog data recorders.

The last 8 rows provide summary statistics. 'Total' and 'Mean' are self explanatory. 'Net Efficiency' is the collection efficiency as explained in Appendix A. 'Efficiency adjusted total' is calculated by multiplying the net efficiency by the total. The mean, standard error and variance based on the efficiency adjustment are provided in the last 3 rows.

Number of fish collected by species, summary statistics and physical parameters collected at BS in June 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	23	29	20	72	12	30	15	57	129
Microgobius gulosus	11	8	12	31	9	5	8	22	53
Lucania parva	8	25	13	46	7	5	5	17	63
Cyprinodon variegatus	-	15	5	20	4	6	7	17	37
Gambusia holbrooki	-	2	3	5	-	-	3	3	8
Gerridae spp.	5	1	1	7	-	1	-	1	8
Large Gerridae spp.	-	-	-	0	1	-	-	1	1
Opsanus beta	-	-	-	0	-	1	-	1	1
Strongylura notata	1	1	-	2	-	-	-	0	2
Syngnathus louisianae	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	49	81	54	184	33	48	38	119	303
Mean				61.33				39.67	50.5
Net efficiency	0.6	1	1	0.87	1	1	1	1	0.93
Efficiency adjusted total	81.67	81	54	216.67	33	48	38	119	335.67
Efficiency adjusted Mean				72.22				39.67	55.95
Efficiency adjusted SE				9.1137				4.4096	8.5731
Efficiency Adjusted variance				249.18				58.333	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
7
Depth:
18
#Species:
56
Day:
23
Month:
6
Year:
1995

Number of fish collected by species, summary statistics and physical parameters collected at HC in June 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	10	10	12	32	28	44	19	91	123
Lucania parva	3	3	3	9	3	3	2	8	17
Fundulus confluentus	-	-	-	0	1	-	3	4	4
Cichlasoma urophthalmus	7	3	5	15	1	-	-	1	16
Gambusia holbrooki	2	10	2	14	-	1	-	1	15
Lucania goodeii	3	2	-	5	1	-	-	1	6
Microgobius gulosus	-	-	-	0	1	-	-	1	1
Poecilia latipinna	-	2	-	2	-	-	-	0	2
Fundulus chrysotus	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	26	30	22	78	35	48	24	107	185
Mean				26				35.67	30.83
Net efficiency	0.875	0.857	1	0.91	1	1	0.8	0.93	0.92
Efficiency adjusted total	29.71	35.01	22	86.72	35	48	30	113	199.72
Efficiency adjusted Mean				28.91				37.67	33.29
Efficiency adjusted SE				3.7771				5.3645	3.5278
Efficiency Adjusted variance				42.799				86.333	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
29
Salin:
0
Depth:
21
#Species:
56
Day:
20
Month:
6
Year:
1995

Number of fish collected by species, summary statistics and physical parameters collected at JB in June 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	12	3	15	15	38	22	75	90
Lucania parva	29	29	16	74	6	3	9	18	92
Poecilia latipinna	19	7	3	29	6	3	8	17	46
Fundulus confluentus	1	-	-	1	13	5	2	20	21
Menidia peninsulae	2	-	12	14	-	12	6	18	32
Microgobius gulosus	3	1	1	5	1	1	2	4	9
Gambusia holbrooki	12	2	-	14	1	-	1	2	16
Cichlasoma urophthalmus	3	9	4	16	-	1	-	1	17
Lucania goodeii	-	2	1	3	-	-	-	0	3
Lepomis punctatus	-	2	-	2	-	-	-	0	2
Cichlasoma urophthalmus (>6.5 cm)	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus glriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	70	64	40	174	42	63	50	155	329
Mean				58				51.67	54.83
Net efficiency	1	1	0.84	0.95	0.92	0.95	1	0.96	0.95
Efficiency adjusted total	70	64	47.62	181.62	45.65	66.32	50	161.97	343.59
Efficiency adjusted Mean				60.54				53.99	57.26
Efficiency adjusted SE				6.6882				6.2916	4.3598
Efficiency Adjusted variance				134.19				118.75	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
29
Salin:
2
Depth:
25
#Species:
56
Day:
15
Month:
6
Year:
1995

Number of fish collected by species, summary statistics and physical parameters collected at TR in June 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Microgobius gulosus	66	58	65	189	1	-	-	1	190
Cyprinodon variegatus	43	12	71	126	1	3	-	4	130
Lucania parva	41	21	37	99	-	6	3	9	108
Lophogobius cyprinoides	17	13	2	32	1	-	-	1	33
Menidia peninsulae	12	11	10	33	-	-	-	0	33
Cichlasoma urophthalmus	4	3	8	15	4	2	3	9	24
Tilapia mariae	2	3	2	7	-	4	-	4	11
Poecilia latipinna	1	1	2	4	-	3	-	3	7
Cichlasoma urophthalmus (>6.5 cm)	-	1	2	3	1	-	-	1	4
Lucania goodeii	2	-	-	2	-	-	-	0	2
Belonesox belizanus	-	-	-	0	-	1	-	1	1
Fundulus confluentus	-	-	-	0	-	1	-	1	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	188	123	199	510	8	20	6	34	544
Mean				170				11.33	90.67
Net efficiency	0.82	0.8	0.88	0.83	0.88	0.9	0.93	0.9	0.87
Efficiency adjusted total	229.27	153.75	226.14	609.16	9.09	22.22	6.45	37.76	646.92
Efficiency adjusted Mean				203.05				12.59	107.82
Efficiency adjusted SE				24.668				4.8766	44.049
Efficiency Adjusted variance				1825.6				71.343	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
29
Salin:
2
Depth:
25
#Species:
56
Day:
13
Month:
6
Year:
1995

Number of fish collected by species, summary statistics and physical parameters collected at BS in November 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Microgobius gulosus	13	19	23	55	17	5	7	29	84
Lucania parva	19	17	14	50	5	4	3	12	62
Cyprinodon variegatus	3	6	6	15	14	-	2	16	31
Menidia peninsulae	57	-	-	57	-	-	-	0	57
Floridichthys carpio	-	-	1	1	2	-	2	4	5
Gambusia holbrooki	3	-	2	5	-	-	2	2	7
Poecilia latipinna	2	2	1	5	-	-	-	0	5
Belonesox belizanus	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	97	44	48	189	38	9	16	63	252
Mean				63				21	42
Net efficiency	0.79	0.83	0.91	0.84	0.79	0.92	0.92	0.88	0.86
Efficiency adjusted total	122.78	53.01	52.75	228.54	48.1	9.78	17.39	75.27	303.81
Efficiency adjusted Mean				76.18				25.09	50.63
Efficiency adjusted SE				23.3				11.713	16.326
Efficiency Adjusted variance				1628.7				411.57	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
20
Salin:
11
Depth:
25
#Species:
58
Day:
27
Month:
11
Year:
1995

Number of fish collected by species, summary statistics and physical parameters collected at HC in November 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	18	10	9	37	10	2	2	14	51
Cyprinodon variegatus	3	-	-	3	2	13	2	17	20
Poecilia latipinna	19	17	4	40	-	8	-	8	48
Fundulus confluentus	-	-	-	0	4	1	-	5	5
Belonesox belizanus	1	-	1	2	-	1	1	2	4
Gambusia holbrooki	1	1	-	2	1	1	-	2	4
Lucania parva	-	-	-	0	2	-	-	2	2
Lucania goodeii	-	-	-	0	-	-	1	1	1
Cichlasoma urophthalmus (>6.5 cm)	1	-	-	1	-	-	-	0	1
Enneacanthus gloriosus	-	-	1	1	-	-	-	0	1
Lepomis punctatus	1	-	-	1	-	-	-	0	1
Tilapia mariae	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	44	29	15	88	19	26	6	51	139
Mean				29.33				17	23.17
Net efficiency	0.6	0.95	0.9	0.82	1	1	0.86	0.95	0.89
Efficiency adjusted total	73.33	30.53	16.67	120.53	19	26	6.98	51.98	172.51
Efficiency adjusted Mean				40.18				17.33	28.75
Efficiency adjusted SE				17.053				5.554	9.5097
Efficiency Adjusted variance				872.38				92.54	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
0
Depth:
14
#Species:
58
Day:
4
Month:
12
Year:
1994

Number of fish collected by species, summary statistics and physical parameters collected at JB in November 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	14	2	8	24	3	19	8	30	54
Cichlasoma urophthalmus	8	20	7	35	7	2	4	13	48
Poecilia latipinna	-	-	3	3	4	1	-	5	8
Cyprinodon variegatus	-	-	-	0	-	4	-	4	4
Cichlasoma urophthalmus (>6.5 cm)	5	18	3	26	-	-	-	0	26
Lucania goodeii	3	3	12	18	-	-	1	1	19
Fundulus confluentus	-	-	-	0	2	-	-	2	2
Microgobius gulosus	-	-	-	0	-	1	-	1	1
Tilapia mariae	-	3	1	4	-	-	-	0	4
Belonesox belizanus	1	2	-	3	-	-	-	0	3
Lepomis marginatus	-	-	3	3	-	-	-	0	3
Lepomis punctatus	-	3	-	3	-	-	-	0	3
Erimyzon sucetta	-	1	-	1	-	-	-	0	1
Ictalurus spp.	-	1	-	1	-	-	-	0	1
Lepomis spp.	-	-	1	1	-	-	-	0	1
Menidia peninsulae	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	32	53	38	123	16	27	13	56	179
Mean				41				18.67	29.83
Net efficiency	0.7	0.8	0.8	0.77	0.8	0.9	0.8	0.83	0.8
Efficiency adjusted total	45.71	66.25	47.5	159.46	20	30	16.25	66.25	225.71
Efficiency adjusted Mean				53.15				22.08	37.62
Efficiency adjusted SE				6.5687				4.1037	7.763
Efficiency Adjusted variance				129.44				50.521	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
0
Depth:
21
#Species:
58
Day:
30
Month:
11
Year:
1995

Number of fish collected by species, summary statistics and physical parameters collected at TR in November 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania goodeii	66	15	20	101	14	7	6	27	128
Lucania parva	67	31	5	103	-	9	10	19	122
Cyprinodon variegatus	15	7	1	23	3	8	13	24	47
Tilapia mariae	3	4	3	10	3	4	-	7	17
Microgobius gulosus	2	12	-	14	-	-	3	3	17
Poecilia latipinna	8	-	2	10	-	3	-	3	13
Cichlasoma urophthalmus	-	4	3	7	-	5	-	5	12
Lophogobius cyprinoides	4	3	5	12	1	-	-	1	13
Notropis sp.	-	-	-	0	-	-	2	2	2
Fundulus seminolis	-	-	-	0	-	-	1	1	1
Cichlasoma urophthalmus (>6.5 cm)	-	-	1	1	-	-	-	0	1
Elassoma evergladei	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	166	76	40	282	21	36	35	92	374
Mean				94				30.67	62.33
Net efficiency	1	0.83	0.88	0.9	0.88	0.9	0.8	0.86	0.88
Efficiency adjusted total	166	91.57	45.45	303.02	23.86	40	43.75	107.61	410.63
Efficiency adjusted Mean				101.01				35.87	68.44
Efficiency adjusted SE				35.118				6.1018	21.593
Efficiency Adjusted variance				3699.9				111.7	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
21
Salin:
0
Depth:
28
#Species:
58
Day:
20
Month:
11
Year:
1995

Number of fish collected by species, summary statistics and physical parameters collected at BS in January 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	-	3	-	3	3	3	2	8	11
Microgobius gulosus	6	6	5	17	1	1	1	3	20
Cyprinodon variegatus	1	2	1	4	1	1	3	5	9
Lucania parva	1	2	3	6	-	1	2	3	9
Trinectes maculatus	-	-	-	0	-	1	1	2	2
Gambusia holbrooki	-	-	3	3	-	-	1	1	4
Fundulus grandis (>6.5 cm)	5	-	-	5	-	-	-	0	5
Fundulus grandis	1	-	-	1	-	-	-	0	1
Poecilia latipinna	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Total	15	13	12	40	5	7	10	22	62
Mean				13.33				7.33	10.33
Net efficiency	0.4	0.8	1	0.73	0.79	0.8	0.6	0.73	0.73
Efficiency adjusted total	37.5	16.25	12	65.75	6.33	8.75	16.67	31.75	97.5
Efficiency adjusted Mean				21.92				10.58	16.25
Efficiency adjusted SE				7.8877				3.1225	4.5624
Efficiency Adjusted variance				186.65				29.25	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
17
Depth:
13
#Species:
56
Day:
1
Month:
2
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at HC in January 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	9	2	23	34	3	-	1	4	38
Poecilia latipinna	27	3	17	47	-	-	-	0	47
Fundulus confluentus	2	3	11	16	2	1	1	4	20
Lucania parva	1	2	2	5	3	-	1	4	9
Fundulus grandis	1	-	8	9	-	-	-	0	9
Jordanella floridae	-	-	-	0	-	1	-	1	1
Fundulus grandis (>6.5 cm)	2	-	2	4	-	-	-	0	4
Gambusia holbrooki	3	1	-	4	-	-	-	0	4
Lucania goodeii	3	-	1	4	-	-	-	0	4
Adinia xenica	-	-	3	3	-	-	-	0	3
Cichlasoma urophthalmus	1	-	-	1	-	-	-	0	1
Lepomis punctatus	1	-	-	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	50	11	67	128	8	2	3	13	141
Mean				42.67				4.33	23.5
Net efficiency	0.9	0.9	1	0.93	0.9	0.9	0.6	0.8	0.87
Efficiency adjusted total	55.56	12.22	67	134.78	8.89	2.22	5	16.11	150.89
Efficiency adjusted Mean				44.93				5.37	25.15
Efficiency adjusted SE				16.683				1.9343	11.604
Efficiency Adjusted variance				835.01				11.225	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
24	
Salin:	
0	
Depth:	
13	
#Species:	
56	
Day:	
22	
Month:	
1	
Year:	
1996	

Number of fish collected by species, summary statistics and physical parameters collected at JB in January 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	1	Sampled	4	5	5	6	19	30	35
Lucania goodeii	23		1	24	-	3	2	5	29
Cyprinodon variegatus	-		-	0	-	1	6	7	7
Fundulus confluentus	-		-	0	1	-	3	4	4
Lepomis punctatus	5		3	8	-	-	-	0	8
Poecilia latipinna	-	Not	-	0	-	-	1	1	1
Lepomis marginatus	-		4	4	-	-	-	0	4
Cichlasoma urophthalmus (>6.5 cm)	1		-	1	-	-	-	0	1
Microgobius gulosus	1		-	1	-	-	-	0	1
Notropis sp.	-		1	1	-	-	-	0	1
Adinia xenica	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Anchoa mitchili	-		-	0	-	-	-	0	0
Belonesox belizanus	-		-	0	-	-	-	0	0
Cichlasoma bimaculatum	-		-	0	-	-	-	0	0
Cichlasoma urophthalmus	-		-	0	-	-	-	0	0
Clarias batrachus	-		-	0	-	-	-	0	0
Cynoscion nebulosus	-		-	0	-	-	-	0	0
Elassoma evergladei	-		-	0	-	-	-	0	0
Elops saurus	-		-	0	-	-	-	0	0
Enneacanthus gloriosus	-		-	0	-	-	-	0	0
Erimyzon sucetta	-		-	0	-	-	-	0	0
Floridichthys carpio	-		-	0	-	-	-	0	0
Fundulus chrysotus	-		-	0	-	-	-	0	0
Fundulus grandis	-	Net	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-		-	0	-	-	-	0	0
Fundulus seminolis	-		-	0	-	-	-	0	0
Fundulus similis	-		-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-		-	0	-	-	-	0	0
Gambusia holbrooki	-		-	0	-	-	-	0	0
Gerridae spp.	-		-	0	-	-	-	0	0
Gobiosoma bosci	-		-	0	-	-	-	0	0
Gobiosoma robustum	-		-	0	-	-	-	0	0
Heterandria formosa	-		-	0	-	-	-	0	0
Jordanella floridae	-		-	0	-	-	-	0	0
Large Gerridae spp.	-		-	0	-	-	-	0	0
LARVAE	-		-	0	-	-	-	0	0
Lepomis gulosus	-		-	0	-	-	-	0	0
Lepomis macrochirus	-	Not	-	0	-	-	-	0	0
Lepomis micolophus	-	Net	-	0	-	-	-	0	0
Lepomis spp.	-		-	0	-	-	-	0	0
Lophogobius cyprinoides	-		-	0	-	-	-	0	0
Menidia peninsulae	-		-	0	-	-	-	0	0
Micropterus salmoides	-		-	0	-	-	-	0	0
Mugil cephalus	-		-	0	-	-	-	0	0
Noturus gyrinus	-	Sampled	-	0	-	-	-	0	0
Opsanus beta	-		-	0	-	-	-	0	0
Oreochromis aureus	-		-	0	-	-	-	0	0
Pogonias chromis	-		-	0	-	-	-	0	0
Scianops ocellatus	-		-	0	-	-	-	0	0
Sphyraena barracuda	-		-	0	-	-	-	0	0
Strongylura notata	-		-	0	-	-	-	0	0
Syngnathus louisianae	-		-	0	-	-	-	0	0
Tilapia mariae	-		-	0	-	-	-	0	0
Trinectes maculatus	-		-	0	-	-	-	0	0
Total	31		13	44	6	10	31	47	91
Mean				22				15.67	18.2
Net efficiency	0.9	0	0.9	0.9	0.7	1	0.9	0.87	0.88
Efficiency adjusted total	34.44		14.44	48.88	8.57	10	34.44	53.01	101.89
Efficiency adjusted Mean				24.44				17.67	20.38
Efficiency adjusted SE				10				8.3952	5.8218
Efficiency Adjusted variance				200				211.44	

5	#NETS
2	#DEEP
3	#FLATS
Temp:	
23	
Salin:	
2	
Depth:	
13	
#Species:	
56	
Day:	
19	
Month:	
1	
Year:	
1996	

Number of fish collected by species, summary statistics and physical parameters collected at TR in January 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania goodeii	106	99	42	247	18	16	6	40	287
Lucania parva	17	8	15	40	20	5	12	37	77
Notropis sp.	19	-	-	19	6	-	2	8	27
Microgobius gulosus	2	9	2	13	-	-	-	0	13
Cyprinodon variegatus	-	-	-	0	6	1	2	9	9
Lophogobius cyprinoides	4	5	2	11	-	-	-	0	11
Lepomis punctatus	3	1	2	6	-	-	-	0	6
Fundulus seminolis	-	-	-	0	1	-	-	1	1
Poecilia latipinna	-	-	-	0	1	-	-	1	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	151	122	63	336	52	22	22	96	432
Mean				112				32	72
Net efficiency	1	1	0.83	0.94	0.6	0.8	1	0.8	0.87
Efficiency adjusted total	151	122	75.9	348.9	86.67	27.5	22	136.17	485.07
Efficiency adjusted Mean				116.3				45.39	80.84
Efficiency adjusted SE				21.866				20.701	20.802
Efficiency Adjusted variance				1434.4				1285.6	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
19
#Species:
56
Day:
25
Month:
1
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at BS in February 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	11	13	25	49	3	6	19	28	77
Lucania parva	10	1	6	17	1	2	5	8	25
Floridichthys carpio	5	2	12	19	2	3	1	6	25
Fundulus grandis	-	3	1	4	-	3	3	6	10
Microgobius gulosus	5	1	9	15	1	-	-	1	16
Poecilia latipinna	18	-	1	19	-	-	-	0	19
Gambusia holbrooki	7	-	-	7	-	-	-	0	7
Opsanus beta	2	-	-	2	-	-	-	0	2
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	58	20	54	132	7	14	28	49	181
Mean				44				16.33	30.17
Net efficiency	0.79	0.8	0.8	0.8	0.79	0.75	0.92	0.82	0.81
Efficiency adjusted total	73.42	25	67.5	165.92	8.86	18.67	30.43	57.96	223.88
Efficiency adjusted Mean				55.31				19.32	37.31
Efficiency adjusted SE				15.249				6.2352	10.91
Efficiency Adjusted variance				697.63				116.63	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
20
Depth:
25
#Species:
56
Day:
7
Month:
3
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at HC in February 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus confluentus	12	19		31				0	31
Cyprinodon variegatus	1	-		1				0	1
Adinia xenica	-	-		0				0	0
Ameirus natalis	-	-		0				0	0
Ameirus natalis	-	-		0				0	0
Anchoa mitchili	-	-		0				0	0
Belonesox belizanus	-	-		0				0	0
Cichlasoma bimaculatum	-	-		0				0	0
Cichlasoma urophthalmus	-	-		0				0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-		0				0	0
Clarias batrachus	-	-		0				0	0
Cynoscion nebulosus	-	-		0				0	0
Elassoma evergladei	-	-		0				0	0
Elops saurus	-	-		0				0	0
Enneacanthus gloriosus	-	-		0				0	0
Erimyzon sucetta	-	-		0				0	0
Floridichthys carpio	-	-		0				0	0
Fundulus chrysotus	-	-		0				0	0
Fundulus grandis	-	-	Net	0	Net	Net	Net	0	0
Fundulus grandis (>6.5 cm)	-	-		0				0	0
Fundulus seminolis	-	-		0				0	0
Fundulus similis	-	-		0				0	0
Fundulus similis (>6.5 cm)	-	-		0				0	0
Gambusia holbrooki	-	-		0				0	0
Gerridae spp.	-	-		0				0	0
Gobiosoma bosci	-	-		0				0	0
Gobiosoma robustum	-	-		0				0	0
Heterandria formosa	-	-		0				0	0
Jordanella floridae	-	-		0				0	0
Large Gerridae spp.	-	-		0				0	0
LARVAE	-	-		0				0	0
Lepomis gulosus	-	-		0				0	0
Lepomis macrochirus	-	-	Not	0	Net	Net	Net	0	0
Lepomis marginatus	-	-		0				0	0
Lepomis micolophus	-	-	Net	0				0	0
Lepomis punctatus	-	-		0				0	0
Lepomis spp.	-	-		0				0	0
Lophogobius cyprinoides	-	-		0				0	0
Lucania goodeii	-	-		0				0	0
Lucania parva	-	-	Sampled	0				0	0
Menidia peninsulae	-	-		0				0	0
Microgobius gulosus	-	-		0				0	0
Micropterus salmoides	-	-		0				0	0
Mugil cephalus	-	-		0				0	0
Notropis sp.	-	-		0				0	0
Noturus gyrinus	-	-	Sampled	0	Dry	Dry	Dry	0	0
Opsanus beta	-	-		0				0	0
Oreochromis aureus	-	-		0				0	0
Poecilia latipinna	-	-	Not	0	Dry	Dry	Dry	0	0
Pogonias chromis	-	-		0				0	0
Scianops ocellatus	-	-		0				0	0
Sphyraena barracuda	-	-		0				0	0
Strongylura notata	-	-		0				0	0
Syngnathus louisianae	-	-		0				0	0
Tilapia mariae	-	-		0				0	0
Trinectes maculatus	-	-		0				0	0
Total	13	19		32				0	32
Mean				16					16
Net efficiency	0.9	0.91	0	0.91	0	0	0		0.91
Efficiency adjusted total	14.44	20.88		35.32					35.32
Efficiency adjusted Mean				17.66					17.66
Efficiency adjusted SE				3.22					3.22
Efficiency Adjusted variance				20.737				0	

2	#NETS
2	#DEEP
0	#FLATS
Temp:	
21	
Salin:	
5	
Depth:	
5	
#Species:	
56	
Day:	
5	
Month:	
3	
Year:	
1996	

Number of fish collected by species, summary statistics and physical parameters collected at JB in February 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus confluentus	7	106	22	135				0	135
Poecilia latipinna	50	52	15	117	Dry	Dry	Dry	0	117
Lucania parva	11	30	21	62				0	62
Cyprinodon variegatus	4	11	34	49				0	49
Lucania goodeii	15	22	7	44				0	44
Fundulus chrysotus	2	23	4	29				0	29
Jordanella floridae	1	20	-	21				0	21
Gambusia holbrooki	2	3	4	9				0	9
Lepomis punctatus	5	1	-	6				0	6
Fundulus grandis (>6.5 cm)	3	-	2	5				0	5
Lepomis marginatus	-	-	1	1				0	1
Adinia xenica	-	-	-	0				0	0
Ameirus natalis	-	-	-	0				0	0
Ameirus natalis	-	-	-	0				0	0
Anchoa mitchili	-	-	-	0				0	0
Belonesox belizanus	-	-	-	0				0	0
Cichlasoma bimaculatum	-	-	-	0				0	0
Cichlasoma urophthalmus	-	-	-	0				0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0				0	0
Clarias batrachus	-	-	-	0				0	0
Cynoscion nebulosus	-	-	-	0				0	0
Elassoma evergladei	-	-	-	0				0	0
Elops saurus	-	-	-	0				0	0
Enneacanthus gloriosus	-	-	-	0				0	0
Erimyzon sucetta	-	-	-	0				0	0
Floridichthys carpio	-	-	-	0				0	0
Fundulus grandis	-	-	-	0	Net	Net	Net	0	0
Fundulus seminolis	-	-	-	0				0	0
Fundulus similis	-	-	-	0				0	0
Fundulus similis (>6.5 cm)	-	-	-	0				0	0
Gerridae spp.	-	-	-	0				0	0
Gobiosoma bosci	-	-	-	0				0	0
Gobiosoma robustum	-	-	-	0				0	0
Heterandria formosa	-	-	-	0				0	0
Large Gerridae spp.	-	-	-	0				0	0
LARVAE	-	-	-	0				0	0
Lepomis gulosus	-	-	-	0				0	0
Lepomis macrochirus	-	-	-	0	Net	Net	Net	0	0
Lepomis micolophus	-	-	-	0				0	0
Lepomis spp.	-	-	-	0				0	0
Lophogobius cyprinoides	-	-	-	0				0	0
Menidia peninsulae	-	-	-	0				0	0
Microgobius gulosus	-	-	-	0				0	0
Micropterus salmoides	-	-	-	0				0	0
Mugil cephalus	-	-	-	0				0	0
Notropis sp.	-	-	-	0				0	0
Noturus gyrinus	-	-	-	0	Dry	Dry	Dry	0	0
Opsanus beta	-	-	-	0				0	0
Oreochromis aureus	-	-	-	0				0	0
Pogonias chromis	-	-	-	0				0	0
Scianops ocellatus	-	-	-	0				0	0
Sphyraena barracuda	-	-	-	0				0	0
Strongylura notata	-	-	-	0				0	0
Syngnathus louisianae	-	-	-	0				0	0
Tilapia mariae	-	-	-	0				0	0
Trinectes maculatus	-	-	-	0				0	0
Total	100	268	110	478				0	478
Mean				159.33					159.33
Net efficiency	0.8	0.9	0.8	0.83	0	0	0		0.83
Efficiency adjusted total	125	297.78	137.5	560.28					560.28
Efficiency adjusted Mean				186.76					186.76
Efficiency adjusted SE				55.627					55.627
Efficiency Adjusted variance				9283.1				0	

3	#NETS
3	#DEEP
0	#FLATS

Temp:
26
Salin:
4
Depth:
-4
#Species:
56
Day:
28
Month:
2
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at TR in February 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania goodeii	79	183	112	374				0	374
Lucania parva	38	71	67	176				0	176
Poecilia latipinna	20	19	11	50	Dry	Dry	Dry	0	50
Cyprinodon variegatus	8	4	23	35				0	35
Fundulus confluentus	12	-	13	25				0	25
Microgobius gulosus	6	10	2	18				0	18
Gambusia holbrooki	5	3	6	14				0	14
Notropis sp.	-	7	-	7				0	7
Enneacanthus gloriosus	-	-	5	5				0	5
Lepomis spp.	5	-	-	5				0	5
Fundulus chrysotus	3	1	-	4				0	4
Elassoma evergladei	1	1	1	3				0	3
Lepomis punctatus	-	3	-	3				0	3
Lophogobius cyprinoides	-	3	-	3				0	3
Jordanella floridae	1	-	1	2				0	2
Adinia xenica	-	-	-	0				0	0
Ameirus natalis	-	-	-	0				0	0
Ameirus natalis	-	-	-	0				0	0
Anchoa mitchili	-	-	-	0				0	0
Belonesox belizanus	-	-	-	0				0	0
Cichlasoma bimaculatum	-	-	-	0				0	0
Cichlasoma urophthalmus	-	-	-	0				0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0				0	0
Clarias batrachus	-	-	-	0				0	0
Cynoscion nebulosus	-	-	-	0				0	0
Elops saurus	-	-	-	0				0	0
Erimyzon sucetta	-	-	-	0				0	0
Floridichthys carpio	-	-	-	0				0	0
Fundulus grandis	-	-	-	0	Net	Net	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0				0	0
Fundulus seminolis	-	-	-	0				0	0
Fundulus similis	-	-	-	0				0	0
Fundulus similis (>6.5 cm)	-	-	-	0				0	0
Gerridae spp.	-	-	-	0				0	0
Gobiosoma bosci	-	-	-	0				0	0
Gobiosoma robustum	-	-	-	0				0	0
Heterandria formosa	-	-	-	0				0	0
Large Gerridae spp.	-	-	-	0				0	0
LARVAE	-	-	-	0				0	0
Lepomis gulosus	-	-	-	0				0	0
Lepomis macrochirus	-	-	-	0	Net	Net	Net	0	0
Lepomis marginatus	-	-	-	0				0	0
Lepomis micolophus	-	-	-	0				0	0
Menidia peninsulae	-	-	-	0				0	0
Micropterus salmoides	-	-	-	0				0	0
Mugil cephalus	-	-	-	0				0	0
Noturus gyrinus	-	-	-	0	Dry	Dry	Dry	0	0
Opsanus beta	-	-	-	0				0	0
Oreochromis aureus	-	-	-	0				0	0
Pogonias chromis	-	-	-	0				0	0
Scianops ocellatus	-	-	-	0				0	0
Sphyraena barracuda	-	-	-	0				0	0
Strongylura notata	-	-	-	0				0	0
Syngnathus louisianae	-	-	-	0				0	0
Tilapia mariae	-	-	-	0				0	0
Trinectes maculatus	-	-	-	0				0	0
Total	178	305	241	724				0	724
Mean				241.33					241.33
Net efficiency	1	0.9	1	0.97	0	0	0		0.97
Efficiency adjusted total	178	338.89	241	757.89					757.89
Efficiency adjusted Mean				252.63					252.63
Efficiency adjusted SE				46.808					46.808
Efficiency Adjusted variance				6572.8				0	

3 #NETS
3 #DEEP
0 #FLATS

Temp:
25
Salin:
1
Depth:
2
#Species:
56
Day:
27
Month:
2
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at BS in March 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	9	1	1	11	23	64	16	103	114
Cyprinodon variegatus	-	-	-	0	5	2	-	7	7
Lucania parva	12	1	2	15	-	1	1	2	17
Gerridae spp.	1	-	2	3	-	-	3	3	6
Menidia peninsulae	12	-	-	12	-	-	-	0	12
Microgobius gulosus	3	-	-	3	1	-	-	1	4
Fundulus grandis (>6.5 cm)	-	-	2	2	-	-	-	0	2
Poecilia latipinna	2	-	-	2	-	-	-	0	2
Fundulus confluentus	-	1	-	1	-	-	-	0	1
Opsanus beta	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	40	3	7	50	29	67	20	116	166
Mean				16.67				38.67	27.67
Net efficiency	0.79	1	0.9	0.9	0.79	0.95	0.92	0.89	0.89
Efficiency adjusted total	50.63	3	7.78	61.41	36.71	70.53	21.74	128.98	190.39
Efficiency adjusted Mean				20.47				42.99	31.73
Efficiency adjusted SE				15.143				14.431	10.624
Efficiency Adjusted variance				687.93				624.73	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
26	
Salin:	
24	
Depth:	
18	
#Species:	
56	
Day:	
19	
Month:	
4	
Year:	
1996	

Number of fish collected by species, summary statistics and physical parameters collected at HC in March 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	23	9	41	73	2	2		4	77
Lucania parva	19	21	33	73	4	-	Sampled	4	77
Poecilia latipinna	9	4	9	22	-	-	Not	0	22
Menidia peninsulae	1	1	13	15	-	-		0	15
Gambusia holbrooki	-	1	1	2	-	1		1	3
Adinia xenica	-	-	-	0	1	-		1	1
LARVAE	-	-	-	0	-	1		1	1
Fundulus confluentus	-	3	5	8	-	-		0	8
Fundulus grandis (>6.5 cm)	5	2	1	8	-	-		0	8
Lucania goodeii	-	1	6	7	-	-		0	7
Fundulus grandis	2	-	-	2	-	-	Net	0	2
Microgobius gulosus	1	-	-	1	-	-		0	1
Ameirus natalis	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-		0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus chrysotus	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-	Sampled	0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	60	42	109	211	7	4		11	222
Mean				70.33				5.5	44.4
Net efficiency	1	1	1	1	0.9	0.6	0	0.75	0.9
Efficiency adjusted total	60	42	109	211	7.78	6.67		14.45	225.45
Efficiency adjusted Mean				70.33				7.22	45.09
Efficiency adjusted SE				20.019				0.555	18.953
Efficiency Adjusted variance				1202.3				0.6161	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
27
Salin:
6
Depth:
8
#Species:
56
Day:
16
Month:
4
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at JB in March 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	56	36	83	175	2	-	-	2	177
Cyprinodon variegatus	3	-	8	11	3	6	5	14	25
Fundulus confluentus	1	6	1	8	-	4	6	10	18
Poecilia latipinna	19	51	1	71	-	-	-	0	71
Menidia peninsulae	19	1	5	25	-	-	-	0	25
Lucania goodeii	8	1	7	16	-	-	-	0	16
Gambusia holbrooki	1	8	2	11	-	-	-	0	11
Fundulus chrysotus	-	2	1	3	-	-	-	0	3
Cichlasoma urophthalmus	-	1	-	1	-	-	-	0	1
Fundulus grandis (>6.5 cm)	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	107	107	108	322	5	10	11	26	348
Mean				107.33				8.67	58
Net efficiency	0.9	0.9	0.4	0.73	0.9	1	0.9	0.93	0.83
Efficiency adjusted total	118.89	118.89	270	507.78	5.56	10	12.22	27.78	535.56
Efficiency adjusted Mean				169.26				9.26	89.26
Efficiency adjusted SE				50.37				1.9579	42.287
Efficiency Adjusted variance				7611.4				11.5	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
23
Salin:
17
Depth:
9
#Species:
56
Day:
12
Month:
4
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at TR in March 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	39	46	45	130	3	11	Sampled	14	144
Lucania goodeii	48	39	42	129	-	-		0	129
Poecilia latipinna	-	19	8	27	-	-	Not	0	27
Fundulus confluentus	1	-	-	1	4	8		12	13
Cyprinodon variegatus	4	2	-	6	2	1		3	9
Lepomis punctatus	3	3	3	9	-	-		0	9
Microgobius gulosus	5	2	2	9	-	-		0	9
Gambusia holbrooki	1	3	1	5	2	-		2	7
Fundulus chrysotus	2	4	1	7	-	-		0	7
Lophogobius cyprinoides	3	3	-	6	-	-		0	6
Menidia peninsulae	-	-	5	5	-	-		0	5
Fundulus similis	-	2	1	3	-	-		0	3
Cichlasoma urophthalmus (>6.5 cm)	-	-	1	1	-	-		0	1
Enneacanthus gloriosus	-	1	-	1	-	-		0	1
Lepomis marginatus	-	-	1	1	-	-		0	1
Micropterus salmoides	1	-	-	1	-	-		0	1
Adinia xenica	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-		0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus grandis	-	-	-	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-	Sampled	0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	107	124	110	341	11	20		31	372
Mean				113.67				15.5	74.4
Net efficiency	1	0.9	1	0.97	0.6	0.6	0	0.6	0.82
Efficiency adjusted total	107	137.78	110	354.78	18.33	33.33		51.66	406.44
Efficiency adjusted Mean				118.26				25.83	81.29
Efficiency adjusted SE				9.7983				7.5	23.389
Efficiency Adjusted variance				288.02				112.5	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
23
Salin:
6
Depth:
12
#Species:
56
Day:
10
Month:
4
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at BS in April 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	-	25	14	39	3	9	23	35	74
Lucania parva	14	6	3	23	1	-	1	2	25
Microgobius gulosus	6	3	2	11	-	3	1	4	15
Gerridae spp.	1	1	1	3	-	3	1	4	7
Large Gerridae spp.	-	-	-	0	-	2	-	2	2
Menidia peninsulae	2	-	-	2	-	-	-	0	2
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Cyprinodon variegatus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	23	35	20	78	4	17	26	47	125
Mean				26				15.67	20.83
Net efficiency	0.9	0.9	0.89	0.9	1	1	1	1	0.95
Efficiency adjusted total	25.56	38.89	22.47	86.92	4	17	26	47	133.92
Efficiency adjusted Mean				28.97				15.67	22.32
Efficiency adjusted SE				5.0379				6.3857	4.6995
Efficiency Adjusted variance				76.142				122.33	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
29
Salin:
25
Depth:
28
#Species:
58
Day:
1
Month:
6
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at HC in April 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	19	12	10	41	15	19	-	34	75
Lucania parva	28	17	10	55	2	3	-	5	60
Fundulus confluentus	11	17	6	34	3	3	-	6	40
Poecilia latipinna	3	2	11	16	1	-	-	1	17
Adinia xenica	2	1	-	3	-	1	-	1	4
Fundulus grandis	2	-	2	4	-	-	-	0	4
Gambusia holbrooki	2	-	2	4	-	-	-	0	4
Cichlasoma urophthalmus	2	1	-	3	-	-	-	0	3
Fundulus grandis (>6.5 cm)	1	-	1	2	-	-	-	0	2
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	70	50	42	162	21	26	0	47	209
Mean				54				15.67	34.83
Net efficiency	0.9	0.9	1	0.93	1	1	0.5	0.83	0.88
Efficiency adjusted total	77.78	55.56	42	175.34	21	26	0	47	222.34
Efficiency adjusted Mean				58.45				15.67	37.06
Efficiency adjusted SE				10.429				4.7455	8.9536
Efficiency Adjusted variance				326.3				67.559	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
5
Depth:
9
#Species:
58
Day:
27
Month:
5
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at JB in April 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	35	32	20	87	-	1	21	22	109
Cyprinodon variegatus	4	4	-	8	5	7	15	27	35
Poecilia latipinna	14	9	-	23	3	1	4	8	31
Fundulus confluentus	1	-	-	1	1	2	1	4	5
Gambusia holbrooki	-	2	-	2	-	-	1	1	3
Menidia peninsulae	-	-	-	0	-	1	-	1	1
Lucania goodeii	2	-	-	2	-	-	-	0	2
Cichlasoma urophthalmus	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	56	48	20	124	9	12	42	63	187
Mean				41.33				21	31.17
Net efficiency	1	1	0.6	0.87	0.7	1	0.9	0.87	0.87
Efficiency adjusted total	56	48	33.33	137.33	12.86	12	46.67	71.53	208.86
Efficiency adjusted Mean				45.78				23.84	34.81
Efficiency adjusted SE				6.638				11.416	7.6767
Efficiency Adjusted variance				132.19				390.98	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
28
Salin:
20
Depth:
19
#Species:
58
Day:
23
Month:
5
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at BS in April 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	89	134	90	313				0	313
Poecilia latipinna	57	51	31	139	Dry	Dry	Dry	0	139
Cyprinodon variegatus	23	10	38	71				0	71
Gambusia holbrooki	16	29	17	62				0	62
Menidia peninsulae	6	21	18	45				0	45
Microgobius gulosus	9	5	9	23				0	23
Lucania goodeii	3	5	-	8				0	8
Cichlasoma urophthalmus (>6.5 cm)	5	1	1	7				0	7
Fundulus chrysotus	3	4	-	7				0	7
Fundulus seminolis	1	1	1	3				0	3
Cichlasoma urophthalmus	1	-	-	1				0	1
Gobiosoma robustum	-	-	1	1				0	1
Lophogobius cyprinoides	-	1	-	1				0	1
Adinia xenica	-	-	-	0				0	0
Ameirus natalis	-	-	-	0				0	0
Anchoa mitchili	-	-	-	0				0	0
Belonesox belizanus	-	-	-	0				0	0
Cichlasoma bimaculatum	-	-	-	0				0	0
Clarias batrachus	-	-	-	0	Dry	Dry	Dry	0	0
Cynoscion nebulosus	-	-	-	0				0	0
Elassoma evergladei	-	-	-	0				0	0
Elops saurus	-	-	-	0				0	0
Enneacanthus gloriosus	-	-	-	0				0	0
Erimyzon sucetta	-	-	-	0				0	0
Floridichthys carpio	-	-	-	0				0	0
Fundulus confluentus	-	-	-	0				0	0
Fundulus grandis	-	-	-	0	Net	Net	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0				0	0
Fundulus similis	-	-	-	0				0	0
Fundulus similis (>6.5 cm)	-	-	-	0				0	0
Gerridae spp.	-	-	-	0				0	0
Gobiosoma bosci	-	-	-	0				0	0
Heterandria formosa	-	-	-	0				0	0
Ictalurus spp.	-	-	-	0				0	0
Jordanella floridae	-	-	-	0				0	0
Large Gerridae spp.	-	-	-	0				0	0
LARVAE	-	-	-	0				0	0
Lepisosteus platyrhincus	-	-	-	0				0	0
Lepomis gulosus	-	-	-	0				0	0
Lepomis macrochirus	-	-	-	0	Net	Net	Net	0	0
Lepomis marginatus	-	-	-	0				0	0
Lepomis micolophus	-	-	-	0				0	0
Lepomis punctatus	-	-	-	0				0	0
Lepomis spp.	-	-	-	0				0	0
Micropterus salmoides	-	-	-	0				0	0
Mugil cephalus	-	-	-	0				0	0
Notropis sp.	-	-	-	0				0	0
Noturus gyrinus	-	-	-	0				0	0
Opsanus beta	-	-	-	0				0	0
Oreochromis aureus	-	-	-	0				0	0
Pogonias chromis	-	-	-	0				0	0
Scianops ocellatus	-	-	-	0				0	0
Sphyraena barracuda	-	-	-	0				0	0
Strongylura notata	-	-	-	0				0	0
Syngnathus louisianae	-	-	-	0				0	0
Syngnathus scovelli	-	-	-	0				0	0
Tilapia mariae	-	-	-	0				0	0
Trinectes maculatus	-	-	-	0				0	0
Total	213	262	206	681				0	681
Mean				227					227
Net efficiency	1	1	1	1	0	0	0		1
Efficiency adjusted total	213	262	206	681					681
Efficiency adjusted Mean				227					227
Efficiency adjusted SE				17.616					17.616
Efficiency Adjusted variance				931				0	

3 #NETS
3 #DEEP
0 #FLATS

Temp:
27
Salin:
18
Depth:
3
#Species:
58
Day:
19
Month:
5
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at BS in June 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	6	6	9	21	-	3	23	26	47
Cyprinodon variegatus	2	7	4	13	6	-	3	9	22
Lucania parva	6	7	9	22	1	-	-	1	23
Fundulus similis	-	-	-	0	-	-	6	6	6
Microgobius gulosus	7	4	1	12	-	1	-	1	13
Poecilia latipinna	4	-	4	8	-	-	-	0	8
Fundulus grandis	-	-	4	4	-	-	-	0	4
Gerridae spp.	-	-	2	2	-	-	-	0	2
Menidia peninsulae	-	-	1	1	-	-	-	0	1
Trinectes maculatus	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Total	26	24	34	84	7	4	32	43	127
Mean				28				14.33	21.17
Net efficiency	1	0.94	0.9	0.95	1	1	1	1	0.97
Efficiency adjusted total	26	25.53	37.78	89.31	7	4	32	43	132.31
Efficiency adjusted Mean				29.77				14.33	22.05
Efficiency adjusted SE				4.0073				8.8757	5.5571
Efficiency Adjusted variance				48.175				236.33	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
32
Salin:
15
Depth:
14
#Species:
56
Day:
11
Month:
7
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at HC in June 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	1	1	14	16	15	12	1	28	44
Lucania parva	9	7	5	21	-	3	1	4	25
Poecilia latipinna	2	2	-	4	-	2	-	2	6
Gambusia holbrooki	4	2	-	6	-	-	-	0	6
Floridichthys carpio	-	4	-	4	-	-	-	0	4
Cichlasoma urophthalmus	1	1	1	3	-	-	-	0	3
Lepomis macrochirus	1	-	-	1	-	-	-	0	1
Menidia peninsulae	-	-	1	1	-	-	-	0	1
Microgobius gulosus	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	18	18	21	57	15	17	2	34	91
Mean				19				11.33	15.17
Net efficiency	0.9	0.9	0.98	0.93	1	1	1	1	0.96
Efficiency adjusted total	20	20	21.43	61.43	15	17	2	34	95.43
Efficiency adjusted Mean				20.48				11.33	15.91
Efficiency adjusted SE				0.4767				4.7022	2.9407
Efficiency Adjusted variance				0.6816				66.333	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
0
Depth:
22
#Species:
56
Day:
3
Month:
7
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at JB in June 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	17	14	18	49	29	22	24	75	124
Lucania parva	32	28	28	88	9	5	14	28	116
Fundulus confluentus	1	6	3	10	7	6	4	17	27
Cichlasoma urophthalmus	10	6	8	24	1	-	1	2	26
Gambusia holbrooki	5	12	-	17	1	-	1	2	19
Poecilia latipinna	2	3	-	5	-	1	2	3	8
Menidia peninsulae	2	1	-	3	-	-	1	1	4
Lucania goodeii	3	-	1	4	-	-	-	0	4
Fundulus grandis (>6.5 cm)	-	2	-	2	-	-	-	0	2
Fundulus grandis	1	-	-	1	-	-	-	0	1
Lepomis macrochirus	1	-	-	1	-	-	-	0	1
Lepomis spp.	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	74	73	58	205	47	34	47	128	333
Mean				68.33				42.67	55.5
Net efficiency	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.75
Efficiency adjusted total	105.71	104.29	82.86	292.86	58.75	42.5	58.75	160	452.86
Efficiency adjusted Mean				97.62				53.33	75.48
Efficiency adjusted SE				7.3914				5.4167	10.717
Efficiency Adjusted variance				163.9				88.021	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
0
Depth:
34
#Species:
56
Day:
25
Month:
6
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at TR in June 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	24	12	36	72	19	18	19	56	128
Microgobius gulosus	59	32	20	111	20	1	-	21	132
Lucania parva	-	26	14	40	8	15	28	51	91
Poecilia latipinna	15	8	19	42	8	14	7	29	71
Menidia peninsulae	4	-	-	4	15	1	5	21	25
Fundulus confluentus	-	-	-	0	2	2	7	11	11
Cichlasoma urophthalmus	-	1	2	3	-	3	-	3	6
Gambusia holbrooki	-	-	-	0	-	1	1	2	2
Lophogobius cyprinoides	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	102	79	92	273	72	55	67	194	467
Mean				91				64.67	77.83
Net efficiency	1	1	1	1	0.9	1	1	0.97	0.98
Efficiency adjusted total	102	79	92	273	80	55	67	202	475
Efficiency adjusted Mean				91				67.33	79.17
Efficiency adjusted SE				6.6583				7.2188	6.8771
Efficiency Adjusted variance				133				156.33	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
29
Salin:
0
Depth:
36
#Species:
56
Day:
30
Month:
6
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at BS in September 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	10	9	2	21	11	12	16	39	60
Lucania parva	3	5	1	9	-	1	2	3	12
Microgobius gulosus	4	-	-	4	2	-	2	4	8
Gerridae spp.	-	4	2	6	1	-	-	1	7
Cyprinodon variegatus	-	-	-	0	-	-	1	1	1
Gambusia holbrooki	2	-	1	3	-	-	-	0	3
Opsanus beta	3	-	-	3	-	-	-	0	3
Cichlasoma urophthalmus	1	-	-	1	-	-	-	0	1
Poecilia latipinna	-	1	-	1	-	-	-	0	1
Trinectes maculatus	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Total	24	19	6	49	14	13	21	48	97
Mean				16.33				16	16.17
Net efficiency	0.86	0.8	1	0.89	1	1	1	1	0.94
Efficiency adjusted total	27.91	23.75	6	57.66	14	13	21	48	105.66
Efficiency adjusted Mean				19.22				16	17.61
Efficiency adjusted SE				6.7182				2.5166	3.2882
Efficiency Adjusted variance				135.4				19	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
31
Salin:
17
Depth:
17
#Species:
58
Day:
31
Month:
8
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at HC in September 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	12	12	2	26	9	18	23	50	76
Fundulus confluentus	-	-	-	0	-	2	4	6	6
Cichlasoma urophthalmus	2	4	4	10	1	-	1	2	12
Lucania parva	4	7	2	13	-	-	-	0	13
Gerridae spp.	-	-	-	0	1	-	-	1	1
Gambusia holbrooki	2	2	-	4	-	-	-	0	4
Lepomis punctatus	-	1	-	1	-	-	-	0	1
Strongylura notata	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	20	27	8	55	11	20	28	59	114
Mean				18.33				19.67	19
Net efficiency	0.4	1	0.6	0.67	1	1	0.75	0.92	0.79
Efficiency adjusted total	50	27	13.33	90.33	11	20	37.33	68.33	158.66
Efficiency adjusted Mean				30.11				22.78	26.44
Efficiency adjusted SE				10.699				7.7266	6.1257
Efficiency Adjusted variance				343.43				179.1	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
32
Salin:
0
Depth:
21
#Species:
58
Day:
6
Month:
9
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at JB in September 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	13	10	15	38	7	4	19	30	68
Cyprinodon variegatus	2	12	-	14	15	1	16	32	46
Poecilia latipinna	1	-	-	1	13	-	-	13	14
Fundulus confluentus	-	-	-	0	8	2	2	12	12
Cichlasoma urophthalmus	6	9	7	22	2	-	1	3	25
Fundulus grandis	-	-	-	0	-	3	1	4	4
Gambusia holbrooki	2	9	-	11	-	-	2	2	13
Adinia xenica	-	-	-	0	1	-	-	1	1
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	1	-	-	1	1
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	1	1	1
Gobiosoma bosci	5	-	-	5	-	-	-	0	5
Lepomis punctatus	1	3	-	4	-	-	-	0	4
Trinectes maculatus	3	1	-	4	-	-	-	0	4
Microgobius gulosus	2	-	-	2	-	-	-	0	2
Ictalurus spp.	-	1	-	1	-	-	-	0	1
Lucania goodeii	-	1	-	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Total	35	46	22	103	47	10	42	99	202
Mean				34.33				33	33.67
Net efficiency	1	1	1	1	0.9	0.875	0.8	0.86	0.93
Efficiency adjusted total	35	46	22	103	52.22	11.43	52.5	116.15	219.15
Efficiency adjusted Mean				34.33				38.72	36.52
Efficiency adjusted SE				6.9362				13.644	6.9146
Efficiency Adjusted variance				144.33				558.44	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
29
Salin:
0
Depth:
19
#Species:
58
Day:
27
Month:
8
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at TR in September 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	7	6		13	19	20	50	89	102
Lucania parva	36	40	Sampled	76	6	5	3	14	90
Poecilia latipinna	9	7	Not	16	17	7	7	31	47
Cichlasoma urophthalmus	1	4		5	5	8	2	15	20
Microgobius gulosus	5	9		14	2	-	-	2	16
Menidia peninsulae	3	-		3	15	-	-	15	18
Fundulus confluentus	-	-		0	-	4	6	10	10
Gambusia holbrooki	1	2		3	-	3	2	5	8
Lepomis spp.	2	-		2	-	-	-	0	2
Tilapia mariae	1	-		1	-	-	-	0	1
Fundulus grandis (>6.5 cm)	-	-		0	-	1	-	1	1
Adinia xenica	-	-		0	-	-	-	0	0
Ameirus natalis	-	-		0	-	-	-	0	0
Anchoa mitchili	-	-		0	-	-	-	0	0
Belonesox belizanus	-	-		0	-	-	-	0	0
Cichlasoma bimaculatum	-	-		0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-		0	-	-	-	0	0
Clarias batrachus	-	-	Sampled	0	-	-	-	0	0
Cynoscion nebulosus	-	-		0	-	-	-	0	0
Elassoma evergladei	-	-		0	-	-	-	0	0
Elops saurus	-	-		0	-	-	-	0	0
Enneacanthus gloriosus	-	-		0	-	-	-	0	0
Erimyzon sucetta	-	-		0	-	-	-	0	0
Floridichthys carpio	-	-		0	-	-	-	0	0
Fundulus chrysotus	-	-		0	-	-	-	0	0
Fundulus grandis	-	-	Net	0	-	-	-	0	0
Fundulus seminolis	-	-		0	-	-	-	0	0
Fundulus similis	-	-		0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-		0	-	-	-	0	0
Gerridae spp.	-	-		0	-	-	-	0	0
Gobiosoma bosci	-	-		0	-	-	-	0	0
Gobiosoma robustum	-	-		0	-	-	-	0	0
Heterandria formosa	-	-		0	-	-	-	0	0
Ictalurus spp.	-	-		0	-	-	-	0	0
Jordanella floridae	-	-		0	-	-	-	0	0
Large Gerridae spp.	-	-		0	-	-	-	0	0
LARVAE	-	-		0	-	-	-	0	0
Lepisosteus platyrhincus	-	-		0	-	-	-	0	0
Lepomis gulosus	-	-		0	-	-	-	0	0
Lepomis macrochirus	-	-	Not	0	-	-	-	0	0
Lepomis marginatus	-	-		0	-	-	-	0	0
Lepomis micolophus	-	-	Net	0	-	-	-	0	0
Lepomis punctatus	-	-		0	-	-	-	0	0
Lophogobius cyprinoides	-	-		0	-	-	-	0	0
Lucania goodeii	-	-		0	-	-	-	0	0
Micropterus salmoides	-	-		0	-	-	-	0	0
Mugil cephalus	-	-		0	-	-	-	0	0
Notropis sp.	-	-		0	-	-	-	0	0
Noturus gyrinus	-	-		0	-	-	-	0	0
Opsanus beta	-	-		0	-	-	-	0	0
Oreochromis aureus	-	-		0	-	-	-	0	0
Pogonias chromis	-	-		0	-	-	-	0	0
Scianops ocellatus	-	-		0	-	-	-	0	0
Sphyraena barracuda	-	-		0	-	-	-	0	0
Strongylura notata	-	-		0	-	-	-	0	0
Syngnathus louisianae	-	-		0	-	-	-	0	0
Syngnathus scovelli	-	-		0	-	-	-	0	0
Trinectes maculatus	-	-		0	-	-	-	0	0
Total	65	68		133	64	48	70	182	315
Mean				66.5				60.67	63
Net efficiency	1	1	0	1	0.875	1	0.6	0.83	0.9
Efficiency adjusted total	65	68		133	73.14	48	116.67	237.81	370.81
Efficiency adjusted Mean				66.5				79.27	74.16
Efficiency adjusted SE				1.5				20.059	11.433
Efficiency Adjusted variance				4.5				1207.1	

5	#NETS
2	#DEEP
3	#FLATS
Temp:	
28	
Salin:	
0	
Depth:	
16	
#Species:	
58	
Day:	
22	
Month:	
8	
Year:	
1996	

Number of fish collected by species, summary statistics and physical parameters collected at BS in November 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	12	7	5	24	9	16	9	34	58
Microgobius gulosus	12	3	9	24	6	5	4	15	39
Lucania parva	14	13	8	35	3	2	3	8	43
Gerridae spp.	2	5	-	7	2	-	-	2	9
Menidia peninsulae	-	-	-	0	-	1	-	1	1
Cichlasoma urophthalmus	-	-	1	1	-	-	-	0	1
Gambusia holbrooki	1	-	-	1	-	-	-	0	1
Poecilia latipinna	-	-	1	1	-	-	-	0	1
Strongylura notata	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Cyprinodon variegatus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	42	28	24	94	20	24	16	60	154
Mean				31.33				20	25.67
Net efficiency	1	0.86	0.92	0.93	0.9	0.87	0.92	0.9	0.91
Efficiency adjusted total	42	32.56	26.09	100.65	22.22	27.59	17.39	67.2	167.85
Efficiency adjusted Mean				33.55				22.4	27.97
Efficiency adjusted SE				4.6194				2.9459	3.4956
Efficiency Adjusted variance				64.017				26.034	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
12
Depth:
25
#Species:
56
Day:
31
Month:
10
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at HC in November 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	24	21	31	76	24	5	22	51	127
Fundulus confluentus	-	2	-	2	-	5	2	7	9
Lucania parva	2	1	1	4	-	5	-	5	9
Gerridae spp.	-	-	-	0	3	-	-	3	3
Gambusia holbrooki	-	5	2	7	-	1	-	1	8
Cichlasoma urophthalmus	1	2	1	4	1	-	-	1	5
Lucania goodeii	2	2	-	4	-	-	-	0	4
Large Gerridae spp.	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	29	33	36	98	28	16	24	68	166
Mean				32.67				22.67	27.67
Net efficiency	0.83	0.94	0.6	0.79	0.94	0.8	1	0.91	0.85
Efficiency adjusted total	34.94	35.11	60	130.05	29.79	20	24	73.79	203.84
Efficiency adjusted Mean				43.35				24.6	33.97
Efficiency adjusted SE				8.3251				2.8418	5.7499
Efficiency Adjusted variance				207.92				24.228	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
0
Depth:
35
#Species:
56
Day:
22
Month:
10
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at JB in November 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	6	2	21	29	7	42	22	71	100
Lucania parva	31	28	36	95	14	6	21	41	136
Gambusia holbrooki	4	15	5	24	3	4	6	13	37
Fundulus confluentus	6	3	1	10	4	2	7	13	23
Cichlasoma urophthalmus	6	7	5	18	2	2	3	7	25
Poecilia latipinna	1	-	-	1	2	2	5	9	10
Fundulus grandis	-	-	-	0	-	1	-	1	1
Lepomis punctatus	1	4	1	6	-	-	-	0	6
Cichlasoma urophthalmus (>6.5 cm)	-	3	-	3	-	-	-	0	3
Microgobius gulosus	3	-	-	3	-	-	-	0	3
Fundulus chrysotus	-	2	-	2	-	-	-	0	2
Lepomis macrochirus	-	-	2	2	-	-	-	0	2
Lucania goodeii	1	-	1	2	-	-	-	0	2
Gerridae spp.	1	-	-	1	-	-	-	0	1
Gobiosoma bosci	1	-	-	1	-	-	-	0	1
Tilapia mariae	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	62	64	72	198	32	59	64	155	353
Mean				66				51.67	58.83
Net efficiency	1	1	1	1	1	1	0.8	0.93	0.97
Efficiency adjusted total	62	64	72	198	32	59	80	171	369
Efficiency adjusted Mean				66				57	61.5
Efficiency adjusted SE				3.0551				13.892	6.6721
Efficiency Adjusted variance				28				579	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
0
Depth:
32
#Species:
56
Day:
28
Month:
10
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at TR in November 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Poecilia latipinna	15	48	6	69	47	29	11	87	156
Cyprinodon variegatus	24	1	6	31	57	18	39	114	145
Lucania parva	19	14	5	38	7	13	8	28	66
Gambusia holbrooki	-	4	7	11	2	5	4	11	22
Cichlasoma urophthalmus	-	1	9	10	3	6	2	11	21
Microgobius gulosus	2	5	4	11	2	-	-	2	13
Tilapia mariae	3	-	5	8	-	-	-	0	8
Menidia peninsulae	-	5	-	5	-	-	-	0	5
Fundulus confluentus	-	-	-	0	-	3	-	3	3
Fundulus chrysotus	-	-	-	0	-	2	-	2	2
Belonesox belizanus	-	-	-	0	1	-	-	1	1
Heterandria formosa	-	-	-	0	-	1	-	1	1
Lucania goodeii	-	-	-	0	1	-	-	1	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus glriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	63	78	42	183	120	77	64	261	444
Mean				61				87	74
Net efficiency	0.9	0.4	0.86	0.72	0.9	0.7	1	0.87	0.79
Efficiency adjusted total	70	195	48.84	313.84	133.33	110	64	307.33	621.17
Efficiency adjusted Mean				104.61				102.44	103.53
Efficiency adjusted SE				45.604				20.367	22.342
Efficiency Adjusted variance				6239.2				1244.5	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
0
Depth:
38
#Species:
56
Day:
10
Month:
10
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at BS in December 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	21	8	10	39	8	22	36	66	105
Microgobius gulosus	12	13	14	39	15	15	5	35	74
Lucania parva	4	4	8	16	1	1	3	5	21
Poecilia latipinna	3	-	3	6	-	-	1	1	7
Fundulus confluentus	-	-	-	0	-	-	1	1	1
Gambusia holbrooki	3	-	1	4	-	-	-	0	4
Gerridae spp.	1	-	-	1	-	-	-	0	1
Opsanus beta	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Cyprinodon variegatus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	45	25	36	106	24	38	46	108	214
Mean				35.33				36	35.67
Net efficiency	0.8	0.86	0.92	0.86	0.6	0.83	1	0.81	0.84
Efficiency adjusted total	56.25	29.07	39.13	124.45	40	45.78	46	131.78	256.23
Efficiency adjusted Mean				41.48				43.93	42.71
Efficiency adjusted SE				7.9339				1.9644	3.6959
Efficiency Adjusted variance				188.84				11.576	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
14
Depth:
22
#Species:
58
Day:
26
Month:
11
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at HC in December 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	3	3	34	40	63	23	41	127	167
Fundulus confluentus	3	3	1	7	-	7	2	9	16
Gambusia holbrooki	26	10	4	40	-	-	-	0	40
Cichlasoma urophthalmus	3	2	3	8	-	2	-	2	10
Lucania parva	4	4	2	10	-	-	-	0	10
Lucania goodeii	3	1	5	9	-	-	-	0	9
Microgobius gulosus	-	1	1	2	-	1	-	1	3
Gerridae spp.	3	1	-	4	-	-	-	0	4
Lepomis punctatus	1	3	-	4	-	-	-	0	4
Poecilia latipinna	1	3	-	4	-	-	-	0	4
Floridichthys carpio	-	-	1	1	-	-	-	0	1
Lophogobius cyprinoides	-	1	-	1	-	-	-	0	1
Menidia peninsulae	-	1	-	1	-	-	-	0	1
Noturus gyrinus	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	48	33	51	132	63	33	43	139	271
Mean				44				46.33	45.17
Net efficiency	0.9	0.9	0.6	0.8	0.9	0.9	1	0.93	0.87
Efficiency adjusted total	53.33	36.67	85	175	70	36.67	43	149.67	324.67
Efficiency adjusted Mean				58.33				49.89	54.11
Efficiency adjusted SE				14.174				10.22	8.0396
Efficiency Adjusted variance				602.72				313.33	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
24	
Salin:	
5	
Depth:	
30	
#Species:	
58	
Day:	
22	
Month:	
11	
Year:	
1996	

Number of fish collected by species, summary statistics and physical parameters collected at JB in December 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	12	8	40	60	1	5	18	24	84
Cyprinodon variegatus	3	1	4	8	3	7	11	21	29
Gambusia holbrooki	7	6	4	17	3	2	5	10	27
Cichlasoma urophthalmus	16	29	2	47	1	2	2	5	52
Fundulus confluentus	-	-	-	0	3	4	3	10	10
Poecilia latipinna	-	15	-	15	2	-	-	2	17
Lepomis punctatus	10	16	1	27	-	-	-	0	27
Fundulus chrysotus	-	-	3	3	-	-	3	3	6
Jordanella floridae	-	-	4	4	-	-	2	2	6
Lucania goodeii	2	-	10	12	-	-	-	0	12
Cichlasoma urophthalmus (>6.5 cm)	3	1	-	4	-	-	-	0	4
Lepomis marginatus	3	-	1	4	-	-	-	0	4
Belonesox belizanus	-	1	2	3	-	-	-	0	3
Clarias batrachus	3	-	-	3	-	-	-	0	3
Lepomis gulosus	1	-	-	1	-	-	-	0	1
Lepomis macrochirus	1	-	-	1	-	-	-	0	1
Microgobius gulosus	1	-	-	1	-	-	-	0	1
Tilapia mariae	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	62	78	71	211	13	20	44	77	288
Mean				70.33				25.67	48
Net efficiency	0.7	1	0.74	0.81	0.91	0.9	0.84	0.88	0.85
Efficiency adjusted total	88.57	78	95.95	262.52	14.29	22.22	52.38	88.89	351.41
Efficiency adjusted Mean				87.51				29.63	58.57
Efficiency adjusted SE				5.2089				11.603	14.136
Efficiency Adjusted variance				81.399				403.89	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
2
Depth:
16
#Species:
58
Day:
19
Month:
11
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at HC in December 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	31	29	39	99	11	10	4	25	124
Poecilia latipinna	20	8	33	61	27	1	6	34	95
Cyprinodon variegatus	5	9	33	47	32	10	3	45	92
Cichlasoma urophthalmus	3	3	4	10	1	3	1	5	15
Menidia peninsulae	14	-	1	15	1	-	-	1	16
Gambusia holbrooki	2	2	7	11	-	3	-	3	14
Lucania goodeii	3	5	3	11	3	-	-	3	14
Tilapia mariae	2	1	3	6	-	-	-	0	6
Fundulus confluentus	-	-	-	0	-	2	2	4	4
Fundulus chrysotus	-	-	-	0	-	1	1	2	2
Microgobius gulosus	-	1	-	1	1	-	-	1	2
Belonesox belizanus	-	-	-	0	-	1	-	1	1
Notropis sp.	-	-	-	0	1	-	-	1	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	80	58	123	261	77	31	17	125	386
Mean				87				41.67	64.33
Net efficiency	1	1	0.86	0.95	0.78	0.8	0.9	0.83	0.89
Efficiency adjusted total	80	58	143.02	281.02	98.72	38.75	18.89	156.36	437.38
Efficiency adjusted Mean				93.67				52.12	72.9
Efficiency adjusted SE				25.478				23.995	18.202
Efficiency Adjusted variance				1947.3				1727.3	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
21
Salin:
0
Depth:
25
#Species:
58
Day:
14
Month:
11
Year:
1996

Number of fish collected by species, summary statistics and physical parameters collected at BS in January 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	1	6	51	58	5	4	8	17	75
Floridichthys carpio	33	5	6	44	3	2	2	7	51
Fundulus grandis	4	1	54	59	-	-	-	0	59
Lucania parva	4	4	2	10	4	2	2	8	18
Gerridae spp.	29	-	-	29	-	-	-	0	29
Microgobius gulosus	4	2	5	11	1	1	2	4	15
Fundulus confluentus	-	-	-	0	1	-	1	2	2
Fundulus grandis (>6.5 cm)	5	1	2	8	-	-	-	0	8
Fundulus similis	2	-	5	7	-	-	-	0	7
Fundulus similis (>6.5 cm)	7	-	-	7	-	-	-	0	7
Menidia peninsulae	5	-	-	5	-	-	-	0	5
Poecilia latipinna	1	2	2	5	-	-	-	0	5
Gambusia holbrooki	2	-	-	2	-	-	-	0	2
Adinia xenica	-	-	1	1	-	-	-	0	1
Opsanus beta	1	-	-	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	98	21	128	247	14	9	15	38	285
Mean				82.33				12.67	47.5
Net efficiency	1	0.8	0.6	0.8	0.8	0.8	0.93	0.84	0.82
Efficiency adjusted total	98	26.25	213.33	337.58	17.5	11.25	16.13	44.88	382.46
Efficiency adjusted Mean				112.53				14.96	63.74
Efficiency adjusted SE				54.492				1.8967	32.719
Efficiency Adjusted variance				8908				10.792	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
21
Depth:
12
#Species:
58
Day:
24
Month:
1
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at HC in January 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	3	4	4	11	19	8	25	52	63
Fundulus confluentus	-	1	-	1	-	3	3	6	7
Gambusia holbrooki	1	2	-	3	-	-	3	3	6
Poecilia latipinna	4	1	-	5	1	-	-	1	6
Adinia xenica	-	-	-	0	-	-	1	1	1
Menidia peninsulae	6	-	-	6	-	-	-	0	6
Lucania goodeii	1	-	4	5	-	-	-	0	5
Lucania parva	1	1	2	4	-	-	-	0	4
Lepomis punctatus	2	-	-	2	-	-	-	0	2
Lepomis spp.	-	-	1	1	-	-	-	0	1
Microgobius gulosus	-	-	1	1	-	-	-	0	1
Noturus gyrinus	1	-	-	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	19	9	12	40	20	11	32	63	103
Mean				13.33				21	17.17
Net efficiency	0.8	1	0.9	0.9	0.9	1	0.7	0.87	0.88
Efficiency adjusted total	23.75	9	13.33	46.08	22.22	11	45.71	78.93	125.01
Efficiency adjusted Mean				15.36				26.31	20.84
Efficiency adjusted SE				4.3773				10.226	5.5447
Efficiency Adjusted variance				57.481				313.74	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
20
#Species:
58
Day:
16
Month:
1
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at JB in January 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Gambusia holbrooki	30	18	14	62	6	14	24	44	106
Lucania parva	45	18	6	69	2	11	7	20	89
Cyprinodon variegatus	1	-	4	5	2	6	17	25	30
Fundulus confluentus	-	1	-	1	4	5	14	23	24
Poecilia latipinna	-	11	-	11	1	-	5	6	17
Jordanella floridae	-	10	-	10	2	2	2	6	16
Lepomis punctatus	19	1	-	20	-	-	-	0	20
Lucania goodeii	11	6	-	17	-	-	-	0	17
Heterandria formosa	-	8	-	8	1	-	-	1	9
Fundulus chrysotus	1	3	-	4	-	-	-	0	4
Menidia peninsulae	3	-	-	3	-	-	-	0	3
Lepomis marginatus	-	2	-	2	-	-	-	0	2
Microgobius gulosus	2	-	-	2	-	-	-	0	2
Lepomis spp.	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	112	79	24	215	18	38	69	125	340
Mean				71.67				41.67	56.67
Net efficiency	0.9	0.9	0.9	0.9	0.7	1	0.9	0.87	0.88
Efficiency adjusted total	124.44	87.78	26.67	238.89	25.71	38	76.67	140.38	379.27
Efficiency adjusted Mean				79.63				46.79	63.21
Efficiency adjusted SE				28.516				15.354	16.239
Efficiency Adjusted variance				2439.6				707.22	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
15
Depth:
17
#Species:
58
Day:
9
Month:
1
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at TR in January 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	44	55	44	143	37	8	14	59	202
Poecilia latipinna	54	57	37	148	4	1	-	5	153
Gambusia holbrooki	14	29	10	53	2	6	5	13	66
Cichlasoma urophthalmus	34	12	14	60	-	-	-	0	60
Lucania parva	34	14	10	58	1	-	-	1	59
Lucania goodeii	29	11	11	51	1	-	-	1	52
Fundulus confluentus	-	2	2	4	4	9	3	16	20
Lepomis marginatus	7	4	6	17	-	-	-	0	17
Jordanella floridae	-	1	-	1	3	5	2	10	11
Fundulus chrysotus	2	-	3	5	-	5	-	5	10
Lepomis punctatus	9	1	-	10	-	-	-	0	10
Fundulus seminolis	1	3	-	4	-	-	-	0	4
Lophogobius cyprinoides	2	-	-	2	-	-	-	0	2
Microgobius gulosus	1	1	-	2	-	-	-	0	2
Cichlasoma urophthalmus (>6.5 cm)	-	-	1	1	-	-	-	0	1
Tilapia mariae	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	231	191	138	560	52	34	24	110	670
Mean				186.67				36.67	111.67
Net efficiency	0.9	1	0.8	0.9	1	0.7	0.9	0.87	0.88
Efficiency adjusted total	256.67	191	172.5	620.17	52	48.57	26.67	127.24	747.41
Efficiency adjusted Mean				206.72				42.41	124.57
Efficiency adjusted SE				25.538				7.9337	38.638
Efficiency Adjusted variance				1956.6				188.83	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
21
Salin:
1
Depth:
21
#Species:
58
Day:
6
Month:
1
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at BS in February 1997

Species	NET 7	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	2	6	8	29	14	4	47	55
Floridichthys carpio	9	24	35	68	1	3	2	6	74
Fundulus grandis	-	13	37	50	-	-	-	0	50
Fundulus grandis (>6.5 cm)	10	3	13	26	-	-	-	0	26
Fundulus similis	-	-	26	26	-	-	-	0	26
Microgobius gulosus	1	2	2	5	2	-	2	4	9
Menidia peninsulae	1	-	-	1	3	-	-	3	4
Gerridae spp.	13	-	-	13	-	-	-	0	13
Fundulus similis (>6.5 cm)	1	-	9	10	-	-	-	0	10
Lucania parva	4	-	-	4	1	-	-	1	5
Adinia xenica	-	-	-	0	-	1	-	1	1
Fundulus confluentus	-	-	-	0	-	1	-	1	1
LARVAE	-	-	-	0	-	-	1	1	1
Opsanus beta	1	-	-	1	-	-	-	0	1
Poecilia latipinna	-	-	1	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	40	44	129	213	36	19	9	64	277
Mean				71				21.33	46.17
Net efficiency	0.8	0.8	0.87	0.82	1	1	0.93	0.98	0.9
Efficiency adjusted total	50	55	148.28	253.28	36	19	9.68	64.68	317.96
Efficiency adjusted Mean				84.43				21.56	52.99
Efficiency adjusted SE				31.959				7.705	20.341
Efficiency Adjusted variance				3064.2				178.1	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
24
Depth:
6
#Species:
56
Day:
3
Month:
3
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at HC in February 1997

Species	NET 7	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus confluentus	4	5	4	13	16	24		40	53
Cyprinodon variegatus	35	57	13	105	14	14		28	133
Gambusia holbrooki	12	12	5	29	8	21		29	58
Poecilia latipinna	1	15	-	16	2	6	Dry	8	24
Adinia xenica	-	1	-	1	-	6		6	7
Menidia peninsulae	3	-	28	31	-	-		0	31
Fundulus grandis (>6.5 cm)	5	1	4	10	-	-		0	10
Fundulus grandis	1	3	-	4	-	-	Net	0	4
Lucania parva	-	-	2	2	-	-		0	2
Fundulus chrysotus	-	-	1	1	-	-		0	1
Jordanella floridae	-	-	1	1	-	-		0	1
LARVAE	1	-	-	1	-	-		0	1
Ameirus natalis	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-		0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Net	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-		0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Lucania goodeii	-	-	-	0	-	-		0	0
Microgobius gulosus	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-	Dry	0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	62	94	58	214	40	71		111	325
Mean				71.33				55.5	65
Net efficiency	1	1	0.83	0.94	1	1	0	1	0.97
Efficiency adjusted total	62	94	69.88	225.88	40	71		111	336.88
Efficiency adjusted Mean				75.29				55.5	67.38
Efficiency adjusted SE				9.626				15.5	8.6792
Efficiency Adjusted variance				277.98				480.5	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
25
Salin:
3
Depth:
7
#Species:
56
Day:
27
Month:
2
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at JB in February 1997

Species	NET 7	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Gambusia holbrooki	398	45	147	590	-	5	7	12	602
Cyprinodon variegatus	19	10	40	69	-	15	6	21	90
Poecilia latipinna	77	115	21	213	-	1	-	1	214
Fundulus confluentus	10	27	9	46	2	11	5	18	64
Jordanella floridae	39	24	1	64	-	-	-	0	64
Lucania parva	31	12	9	52	-	-	1	1	53
Heterandria formosa	17	16	3	36	-	-	1	1	37
Lepomis punctatus	18	6	-	24	-	-	-	0	24
Fundulus grandis (>6.5 cm)	-	11	-	11	-	-	-	0	11
Lucania goodeii	7	1	2	10	-	-	-	0	10
Fundulus chrysotus	1	5	3	9	-	-	-	0	9
Menidia peninsulae	5	-	1	6	-	-	-	0	6
Lepomis marginatus	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	622	273	236	1131	2	32	20	54	1185
Mean				377				18	197.5
Net efficiency	0.7	1	1	0.9	0.9	1	0.8	0.9	0.9
Efficiency adjusted total	888.57	273	236	1397.6	2.22	32	25	59.22	1456.8
Efficiency adjusted Mean				465.86				19.74	242.8
Efficiency adjusted SE				211.63				8.99	137.57
Efficiency Adjusted variance				134357				242.46	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
5
Depth:
8
#Species:
56
Day:
24
Month:
2
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at TR in February 1997

Species	NET 7	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Poecilia latipinna	75	122	79	276	-	-	Dry	0	276
Gambusia holbrooki	25	116	41	182	-	-		0	182
Cyprinodon variegatus	65	32	30	127	3	-		3	130
Fundulus confluentus	3	11	2	16	1	1		2	18
Lepomis marginatus	3	6	6	15	-	-		0	15
Fundulus chrysotus	-	3	6	9	-	4		4	13
Lucania goodeii	5	4	5	14	-	-		0	14
Lepomis punctatus	6	1	6	13	-	-		0	13
Cichlasoma urophthalmus	5	2	4	11	-	-		0	11
Heterandria formosa	3	-	5	8	1	1		2	10
Jordanella floridae	2	6	-	8	-	-		0	8
Lucania parva	4	-	1	5	-	-		0	5
Adinia xenica	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-		0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus grandis	-	-	-	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Net	0	0
Lepomis micolophus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Menidia peninsulae	-	-	-	0	-	-		0	0
Microgobius gulosus	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-	Dry	0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	196	303	185	684	5	6		11	695
Mean				228				5.5	139
Net efficiency	0.9	0.7	1	0.87	1	0.9	0	0.95	0.9
Efficiency adjusted total	217.78	432.86	185	835.64	5	6.67		11.67	847.31
Efficiency adjusted Mean				278.55				5.84	169.46
Efficiency adjusted SE				77.735				0.835	79.216
Efficiency Adjusted variance				18128				1.3945	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
24
Salin:
1
Depth:
6
#Species:
56
Day:
20
Month:
2
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at BS in March 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	8	4	-	12	20	7	2	29	41
Cyprinodon variegatus	1	1	1	3	10	16	1	27	30
Lucania parva	12	1	4	17	4	3	2	9	26
Gerridae spp.	-	-	2	2	6	-	-	6	8
Menidia peninsulae	-	-	-	0	4	-	-	4	4
Microgobius gulosus	3	3	5	11	-	-	-	0	11
Fundulus grandis	-	-	-	0	2	-	-	2	2
Strongylura notata	-	-	-	0	-	-	1	1	1
Syngnathus louisianae	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	24	9	13	46	46	26	6	78	124
Mean				15.33				26	20.67
Net efficiency	0.6	0.85	0.87	0.77	0.9	0.94	1	0.95	0.86
Efficiency adjusted total	40	10.59	14.94	65.53	51.11	27.66	6	84.77	150.3
Efficiency adjusted Mean				21.84				28.26	25.05
Efficiency adjusted SE				9.1648				13.026	7.2655
Efficiency Adjusted variance				251.98				509	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
32
Depth:
16
#Species:
56
Day:
1
Month:
4
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at HC in March 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	4	7	11	12	7	21	40	51
Gambusia holbrooki	1	-	-	1	-	1	26	27	28
Fundulus confluentus	-	-	-	0	1	1	10	12	12
Lucania parva	2	4	7	13	-	1	-	1	14
Poecilia latipinna	2	-	-	2	-	-	1	1	3
Jordanella floridae	-	1	-	1	-	-	-	0	1
Microgobius gulosus	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	6	9	14	29	13	10	58	81	110
Mean				9.67				27	18.33
Net efficiency	0.4	0.9	1	0.77	0.8	0.95	0.6	0.78	0.78
Efficiency adjusted total	15	10	14	39	16.25	10.53	96.67	123.45	162.45
Efficiency adjusted Mean				13				41.15	27.07
Efficiency adjusted SE				1.5275				27.809	13.956
Efficiency Adjusted variance				7				2320	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
20
Depth:
16
#Species:
56
Day:
26
Month:
3
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at JB in March 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Gambusia holbrooki	51	28	14	93	5	24	18	47	140
Cyprinodon variegatus	5	-	1	6	5	13	18	36	42
Lucania parva	42	17	5	64	3	9	5	17	81
Fundulus confluentus	5	4	2	11	4	5	13	22	33
Heterandria formosa	18	29	6	53	3	-	1	4	57
Jordanella floridae	46	32	3	81	-	-	-	0	81
Poecilia latipinna	12	21	-	33	-	2	1	3	36
Fundulus chrysotus	-	5	-	5	-	-	-	0	5
Lucania goodeii	1	-	1	2	-	-	-	0	2
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	180	136	32	348	20	53	56	129	477
Mean				116				43	79.5
Net efficiency	0.6	1	0.7	0.77	0.5	1	1	0.83	0.8
Efficiency adjusted total	300	136	45.71	481.71	40	53	56	149	630.71
Efficiency adjusted Mean				160.57				49.67	105.12
Efficiency adjusted SE				74.428				4.9103	41.566
Efficiency Adjusted variance				16619				72.333	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
19
Depth:
16
#Species:
56
Day:
22
Month:
3
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at TR in March 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Gambusia holbrooki	281	411	29	721	10	-	-	10	731
Poecilia latipinna	92	78	68	238	1	-	-	1	239
Heterandria formosa	26	24	26	76	2	2	-	4	80
Fundulus confluentus	30	27	3	60	6	-	-	6	66
Cyprinodon variegatus	14	7	5	26	16	3	13	32	58
Jordanella floridae	8	8	5	21	1	1	-	2	23
Lucania goodeii	-	4	9	13	-	-	-	0	13
Fundulus chrysotus	2	5	4	11	-	-	1	1	12
Lucania parva	3	2	6	11	-	-	-	0	11
Cichlasoma urophthalmus	4	-	4	8	-	-	-	0	8
Lepomis punctatus	1	-	2	3	-	-	-	0	3
Cichlasoma urophthalmus (>6.5 cm)	-	-	1	1	-	-	-	0	1
Lepomis marginatus	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	461	567	162	1190	36	6	14	56	1246
Mean				396.67				18.67	207.67
Net efficiency	0.9	0.8	1	0.9	0.8	0.6	0.9	0.77	0.83
Efficiency adjusted total	512.22	708.75	162	1383	45	10	15.56	70.56	1453.5
Efficiency adjusted Mean				460.99				23.52	242.26
Efficiency adjusted SE				159.9				10.859	121.27
Efficiency Adjusted variance				76702				353.77	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
4
Depth:
8
#Species:
56
Day:
19
Month:
3
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at BS in April 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	2	1	6	9	9	8	19	36	45
Floridichthys carpio	1	10	8	19	7	11	15	33	52
Lucania parva	19	21	5	45	4	3	2	9	54
Gerridae spp.	-	-	1	1	-	2	2	4	5
Microgobius gulosus	2	2	2	6	-	1	-	1	7
Poecilia latipinna	-	1	-	1	1	-	-	1	2
Gambusia holbrooki	-	-	2	2	-	-	-	0	2
Opsanus beta	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	25	35	24	84	21	25	38	84	168
Mean				28				28	28
Net efficiency	0.7	0.8	0.87	0.79	0.8	0.9	0.8	0.83	0.81
Efficiency adjusted total	35.71	43.75	27.59	107.05	26.25	27.78	47.5	101.53	208.58
Efficiency adjusted Mean				35.68				33.84	34.76
Efficiency adjusted SE				4.665				6.8426	3.7264
Efficiency Adjusted variance				65.287				140.46	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
28
Salin:
35
Depth:
22
#Species:
56
Day:
30
Month:
4
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at HC in April 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	4	5	8	17	4	4	8	16	33
Lucania parva	8	10	6	24	1	-	1	2	26
Fundulus confluentus	2	1	2	5	2	1	1	4	9
Gambusia holbrooki	3	2	1	6	-	-	-	0	6
Menidia peninsulae	1	2	1	4	-	-	-	0	4
Fundulus grandis (>6.5 cm)	1	-	-	1	-	-	-	0	1
Microgobius gulosus	1	-	-	1	-	-	-	0	1
Poecilia latipinna	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	21	20	18	59	7	5	10	22	81
Mean				19.67				7.33	13.5
Net efficiency	0.72	0.7	0.7	0.71	0.8	0.8	0.8	0.8	0.75
Efficiency adjusted total	29.17	28.57	25.71	83.45	8.75	6.25	12.5	27.5	110.95
Efficiency adjusted Mean				27.82				9.17	18.49
Efficiency adjusted SE				1.0675				1.8162	4.2754
Efficiency Adjusted variance				3.4186				9.8959	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
26
Depth:
19
#Species:
56
Day:
24
Month:
4
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at JB in April 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Gambusia holbrooki	22	84	19	125	15	8	38	61	186
Cyprinodon variegatus	35	5	27	67	10	13	27	50	117
Lucania parva	124	24	28	176	12	3	8	23	199
Poecilia latipinna	100	13	34	147	14	-	1	15	162
Fundulus confluentus	1	3	4	8	5	3	6	14	22
Jordanella floridae	1	24	1	26	1	-	-	1	27
Fundulus grandis	-	-	-	0	3	1	-	4	4
Heterandria formosa	6	6	1	13	-	-	-	0	13
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	289	159	114	562	60	28	80	168	730
Mean				187.33				56	121.67
Net efficiency	0.6	1	0.8	0.8	0.6	0.9	0.7	0.73	0.77
Efficiency adjusted total	481.67	159	142.5	783.17	100	31.11	114.29	245.4	1028.6
Efficiency adjusted Mean				261.06				81.8	171.43
Efficiency adjusted SE				110.41				25.679	64.626
Efficiency Adjusted variance				36571				1978.2	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
27
Depth:
17
#Species:
56
Day:
21
Month:
4
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at TR in April 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Gambusia holbrooki	249	638	80	967	12	9	1	22	989
Poecilia latipinna	22	51	33	106	4	-	10	14	120
Lucania parva	27	32	38	97	-	-	-	0	97
Cyprinodon variegatus	5	17	5	27	9	9	6	24	51
Fundulus confluentus	1	12	-	13	23	5	7	35	48
Heterandria formosa	12	25	12	49	6	-	-	6	55
Jordanella floridae	2	5	1	8	15	1	3	19	27
Microgobius gulosus	8	15	4	27	-	-	-	0	27
Menidia peninsulae	-	6	12	18	-	-	-	0	18
Lucania goodeii	3	4	10	17	-	-	-	0	17
Cichlasoma urophthalmus	4	2	1	7	-	-	-	0	7
Cichlasoma urophthalmus (>6.5 cm)	2	1	2	5	-	-	-	0	5
Fundulus chrysotus	-	-	-	0	-	-	2	2	2
Belonesox belizanus	-	-	-	0	-	-	1	1	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	335	808	198	1341	69	24	30	123	1464
Mean				447				41	244
Net efficiency	0.7	0.9	0.8	0.8	1	0.7	0.7	0.8	0.8
Efficiency adjusted total	478.57	897.78	247.5	1623.9	69	34.29	42.86	146.15	1770
Efficiency adjusted Mean				541.28				48.72	295
Efficiency adjusted SE				190.32				10.439	139.27
Efficiency Adjusted variance				108666				326.92	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
22
Depth:
10
#Species:
56
Day:
17
Month:
4
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at BS in June 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	1	11	1	13	9	23	8	40	53
Lucania parva	42	20	26	88	1	2	2	5	93
Microgobius gulosus	6	4	6	16	6	3	-	9	25
Cyprinodon variegatus	6	5	9	20	1	2	3	6	26
Gerridae spp.	-	-	3	3	-	-	4	4	7
Poecilia latipinna	8	2	2	12	-	-	1	1	13
Menidia peninsulae	11	-	-	11	-	-	-	0	11
Opsanus beta	3	-	-	3	-	-	-	0	3
Gambusia holbrooki	-	-	1	1	-	-	-	0	1
Large Gerridae spp.	1	-	-	1	-	-	-	0	1
Sphyraena barracuda	-	-	1	1	-	-	-	0	1
Strongylura notata	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	78	42	50	170	17	30	18	65	235
Mean				56.67				21.67	39.17
Net efficiency	1	0.8	0.87	0.89	1	1	0.7	0.9	0.9
Efficiency adjusted total	78	52.5	57.47	187.97	17	30	25.71	72.71	260.68
Efficiency adjusted Mean				62.66				24.24	43.45
Efficiency adjusted SE				7.8047				3.8244	9.4293
Efficiency Adjusted variance				182.74				43.878	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
2
Depth:
16
#Species:
56
Day:
25
Month:
6
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at HC in June 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	7	12	8	27	10	7	8	25	52
Lucania parva	4	9	6	19	2	4	6	12	31
Gambusia holbrooki	2	3	2	7	-	1	-	1	8
Fundulus confluentus	1	2	-	3	-	-	1	1	4
Belonesox belizanus	-	1	-	1	-	-	-	0	1
Lepomis punctatus	1	-	-	1	-	-	-	0	1
Poecilia latipinna	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	15	27	17	59	12	12	15	39	98
Mean				19.67				13	16.33
Net efficiency	0.8	0.8	1	0.87	1	1	0.6	0.87	0.87
Efficiency adjusted total	18.75	33.75	17	69.5	12	12	25	49	118.5
Efficiency adjusted Mean				23.17				16.33	19.75
Efficiency adjusted SE				5.3157				4.3333	3.4266
Efficiency Adjusted variance				84.771				56.333	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
32
Salin:
3
Depth:
30
#Species:
56
Day:
20
Month:
6
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at JB in June 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	72	84	296	452	47	64	112	223	675
Lucania parva	57	55	36	148	26	13	37	76	224
Poecilia latipinna	22	14	7	43	2	-	2	4	47
Fundulus confluentus	1	-	-	1	3	-	-	3	4
Microgobius gulosus	-	-	-	0	1	1	1	3	3
Gambusia holbrooki	3	-	-	3	-	-	1	1	4
Fundulus grandis	1	1	-	2	-	-	-	0	2
Cichlasoma urophthalmus (>6.5 cm)	-	1	-	1	-	-	-	0	1
Lucania goodeii	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	156	155	340	651	79	78	153	310	961
Mean				217				103.33	160.17
Net efficiency	0.8	0.6	0.9	0.77	1	0.7	0.7	0.8	0.78
Efficiency adjusted total	195	258.33	377.78	831.11	79	111.43	218.57	409	1240.1
Efficiency adjusted Mean				277.04				136.33	206.68
Efficiency adjusted SE				53.587				42.171	43.816
Efficiency Adjusted variance				8614.6				5335.1	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
33
Salin:
1
Depth:
39
#Species:
56
Day:
17
Month:
6
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at TR in June 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Microgobius gulosus	23		9	32	39	1	9	49	81
Lucania parva	7	Sampled	21	28	4	4	1	9	37
Cyprinodon variegatus	-		-	0	5	2	21	28	28
Poecilia latipinna	2	Not	3	5	6	2	1	9	14
Menidia peninsulae	1		5	6	1	-	-	1	7
Cichlasoma urophthalmus	-		3	3	3	1	-	4	7
Lucania goodeii	-		3	3	-	-	-	0	3
Belonesox belizanus	1		1	2	-	1	-	1	3
Gambusia holbrooki	1		1	2	-	-	1	1	3
Fundulus confluentus	-		-	0	-	2	-	2	2
Cichlasoma urophthalmus (>6.5 cm)	-		1	1	-	-	-	0	1
Enneacanthus gloriosus	-		1	1	-	-	-	0	1
Jordanella floridae	-		-	0	-	-	1	1	1
Lepomis marginatus	-		-	0	-	1	-	1	1
Adinia xenica	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Anchoa mitchili	-		-	0	-	-	-	0	0
Cichlasoma bimaculatum	-		-	0	-	-	-	0	0
Clarias batrachus	-		-	0	-	-	-	0	0
Cynoscion nebulosus	-		-	0	-	-	-	0	0
Elassoma evergladei	-		-	0	-	-	-	0	0
Elops saurus	-		-	0	-	-	-	0	0
Erimyzon sucetta	-		-	0	-	-	-	0	0
Floridichthys carpio	-		-	0	-	-	-	0	0
Fundulus chrysotus	-		-	0	-	-	-	0	0
Fundulus grandis	-	Net	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-		-	0	-	-	-	0	0
Fundulus seminolis	-		-	0	-	-	-	0	0
Fundulus similis	-		-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-		-	0	-	-	-	0	0
Gerridae spp.	-		-	0	-	-	-	0	0
Gobiosoma bosci	-		-	0	-	-	-	0	0
Gobiosoma robustum	-		-	0	-	-	-	0	0
Heterandria formosa	-		-	0	-	-	-	0	0
Large Gerridae spp.	-		-	0	-	-	-	0	0
LARVAE	-		-	0	-	-	-	0	0
Lepomis gulosus	-		-	0	-	-	-	0	0
Lepomis macrochirus	-	Not	-	0	-	-	-	0	0
Lepomis micolophus	-	Net	-	0	-	-	-	0	0
Lepomis punctatus	-		-	0	-	-	-	0	0
Lepomis spp.	-		-	0	-	-	-	0	0
Lophogobius cyprinoides	-		-	0	-	-	-	0	0
Micropterus salmoides	-		-	0	-	-	-	0	0
Mugil cephalus	-		-	0	-	-	-	0	0
Notropis sp.	-		-	0	-	-	-	0	0
Noturus gyrinus	-	Sampled	-	0	-	-	-	0	0
Opsanus beta	-		-	0	-	-	-	0	0
Oreochromis aureus	-		-	0	-	-	-	0	0
Pogonias chromis	-		-	0	-	-	-	0	0
Scianops ocellatus	-		-	0	-	-	-	0	0
Sphyraena barracuda	-		-	0	-	-	-	0	0
Strongylura notata	-		-	0	-	-	-	0	0
Syngnathus louisianae	-		-	0	-	-	-	0	0
Tilapia mariae	-		-	0	-	-	-	0	0
Trinectes maculatus	-		-	0	-	-	-	0	0
Total	35		48	83	58	14	34	106	189
Mean				41.5				35.33	37.8
Net efficiency	0.4	0	0.7	0.55	1	1	0.9	0.97	0.8
Efficiency adjusted total	87.5		68.57	156.07	58	14	37.78	109.78	265.85
Efficiency adjusted Mean				78.03				36.59	53.17
Efficiency adjusted SE				9.465				12.716	12.669
Efficiency Adjusted variance				179.17				485.06	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
30
Salin:
1
Depth:
60
#Species:
56
Day:
13
Month:
6
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at BS in September 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	5	7	-	12	18	23	8	49	61
Lucania parva	25	33	17	75	4	10	6	20	95
Microgobius gulosus	6	4	2	12	2	-	4	6	18
Cyprinodon variegatus	2	3	11	16	-	-	2	2	18
Gerridae spp.	-	3	8	11	-	-	-	0	11
Cichlasoma urophthalmus	1	1	2	4	-	1	-	1	5
Gambusia holbrooki	-	2	1	3	-	-	-	0	3
Poecilia latipinna	1	1	-	2	-	-	-	0	2
Belonesox belizanus	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	40	54	42	136	24	34	20	78	214
Mean				45.33				26	35.67
Net efficiency	0.6	0.78	0.87	0.75	0.87	0.92	0.88	0.89	0.82
Efficiency adjusted total	66.67	69.23	48.28	184.18	27.59	36.96	22.73	87.28	271.46
Efficiency adjusted Mean				61.39				29.09	45.24
Efficiency adjusted SE				6.5982				4.1761	8.0224
Efficiency Adjusted variance				130.61				52.318	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
3
Depth:
25
#Species:
56
Day:
8
Month:
10
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at HC in September 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	3	8	6	17	10	3	28	41	58
Lucania parva	8	9	16	33	8	3	2	13	46
Cichlasoma urophthalmus	3	6	20	29	4	1	-	5	34
Floridichthys carpio	-	-	-	0	2	-	1	3	3
Fundulus confluentus	-	-	1	1	-	2	-	2	3
Gambusia holbrooki	1	2	4	7	-	-	-	0	7
Poecilia latipinna	2	-	1	3	-	-	-	0	3
Microgobius gulosus	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	18	25	48	91	24	9	31	64	155
Mean				30.33				21.33	25.83
Net efficiency	0.79	1	0.85	0.88	1	1	1	1	0.94
Efficiency adjusted total	22.78	25	56.47	104.25	24	9	31	64	168.25
Efficiency adjusted Mean				34.75				21.33	28.04
Efficiency adjusted SE				10.879				6.4893	6.4104
Efficiency Adjusted variance				355.05				126.33	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
0
Depth:
27
#Species:
56
Day:
22
Month:
9
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at JB in September 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	34	27	30	91	47	12	29	88	179
Cyprinodon variegatus	2	8	5	15	22	-	11	33	48
Fundulus confluentus	1	1	-	2	4	-	1	5	7
Cichlasoma urophthalmus	2	6	4	12	-	-	3	3	15
Microgobius gulosus	-	-	-	0	-	3	-	3	3
Poecilia latipinna	1	-	-	1	-	-	2	2	3
Adinia xenica	-	-	-	0	-	-	1	1	1
Gerridae spp.	-	-	-	0	-	-	1	1	1
Gambusia holbrooki	1	5	1	7	-	-	-	0	7
Cichlasoma urophthalmus (>6.5 cm)	1	-	-	1	-	-	-	0	1
Menidia peninsulae	-	-	1	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	42	47	41	130	73	15	48	136	266
Mean				43.33				45.33	44.33
Net efficiency	0.8	0.92	0.87	0.86	0.8	1	0.82	0.87	0.87
Efficiency adjusted total	52.5	51.09	47.13	150.72	91.25	15	58.54	164.79	315.51
Efficiency adjusted Mean				50.24				54.93	52.59
Efficiency adjusted SE				1.6074				22.085	9.9584
Efficiency Adjusted variance				7.7511				1463.3	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
31
Salin:
0
Depth:
39
#Species:
56
Day:
30
Month:
9
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at TR in September 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	39	44	9	92	3	1	4	8	100
Cichlasoma urophthalmus	6	10	13	29	6	7	8	21	50
Microgobius gulosus	16	6	1	23	5	2	3	10	33
Poecilia latipinna	2	4	2	8	2	5	1	8	16
Cyprinodon variegatus	-	1	1	2	6	1	3	10	12
Lophogobius cyprinoides	5	6	1	12	-	-	-	0	12
Belonesox belizanus	-	-	-	0	-	1	1	2	2
Fundulus confluentus	-	-	-	0	-	1	1	2	2
Floridichthys carpio	-	-	-	0	-	-	1	1	1
Gambusia holbrooki	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	68	71	28	167	22	18	22	62	229
Mean				55.67				20.67	38.17
Net efficiency	1	0.8	0.4	0.73	1	0.6	1	0.87	0.8
Efficiency adjusted total	68	88.75	70	226.75	22	30	22	74	300.75
Efficiency adjusted Mean				75.58				24.67	50.13
Efficiency adjusted SE				6.6086				2.6667	11.823
Efficiency Adjusted variance				131.02				21.333	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
1
Depth:
30
#Species:
56
Day:
17
Month:
9
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at BS in November 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	1	3	7	11	11	19	5	35	46
Lucania parva	12	14	9	35	4	3	11	18	53
Microgobius gulosus	7	11	14	32	3	4	1	8	40
Cyprinodon variegatus	-	1	1	2	8	2	3	13	15
Poecilia latipinna	1	-	5	6	4	-	-	4	10
Strongylura notata	5	2	6	13	-	-	-	0	13
Menidia peninsulae	-	-	-	0	-	-	3	3	3
Cichlasoma urophthalmus	-	-	2	2	-	1	1	2	4
Gambusia holbrooki	-	-	4	4	-	-	1	1	5
Fundulus similis (>6.5 cm)	-	-	-	0	-	1	-	1	1
Gerridae spp.	-	-	-	0	-	-	1	1	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	26	31	48	105	30	30	26	86	191
Mean				35				28.67	31.83
Net efficiency	0.9	0.9	0.8	0.87	0.4	0.7	0.7	0.6	0.73
Efficiency adjusted total	28.89	34.44	60	123.33	75	42.86	37.14	155	278.33
Efficiency adjusted Mean				41.11				51.67	46.39
Efficiency adjusted SE				9.5799				11.783	7.1899
Efficiency Adjusted variance				275.32				416.51	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
17
Depth:
19
#Species:
58
Day:
20
Month:
11
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at HC in November 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	6	7	6	19	14	2	Sampled	16	35
Cyprinodon variegatus	2	2	1	5	7	-		7	12
Gambusia holbrooki	11	6	3	20	3	2		5	25
Cichlasoma urophthalmus	9	19	12	40	-	1		1	41
Fundulus chrysotus	-	1	-	1	1	-		1	2
Fundulus confluentus	-	-	-	0	-	1		1	1
Poecilia latipinna	-	-	-	0	1	-	Not	1	1
Belonesox belizanus	-	4	1	5	-	-		0	5
Lepomis punctatus	-	-	2	2	-	-		0	2
Cichlasoma urophthalmus (>6.5 cm)	-	1	-	1	-	-		0	1
Lucania goodeii	-	-	1	1	-	-		0	1
Tilapia mariae	-	1	-	1	-	-		0	1
Adinia xenica	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-	Sampled	0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus grandis	-	-	-	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Ictalurus spp.	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepisosteus platyrhincus	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Menidia peninsulae	-	-	-	0	-	-		0	0
Microgobius gulosus	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-		0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Syngnathus scovelli	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	28	41	26	95	26	6		32	127
Mean				31.67				16	25.4
Net efficiency	0.9	0.9	0.85	0.88	1	1	0	1	0.93
Efficiency adjusted total	31.11	45.56	30.59	107.26	26	6		32	139.26
Efficiency adjusted Mean				35.75				16	27.85
Efficiency adjusted SE				4.9056				10	6.3743
Efficiency Adjusted variance				72.196				200	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
25
Salin:
3
Depth:
22
#Species:
58
Day:
16
Month:
11
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at JB in November 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	25	5	39	69	2	55	2	59	128
Cyprinodon variegatus	-	-	2	2	6	28	12	46	48
Cichlasoma urophthalmus	12	22	3	37	3	2	2	7	44
Poecilia latipinna	4	-	-	4	7	-	-	7	11
Gambusia holbrooki	7	2	12	21	-	-	4	4	25
Belonesox belizanus	-	3	3	6	1	-	1	2	8
Lepomis punctatus	-	3	-	3	-	-	1	1	4
Cichlasoma urophthalmus (>6.5 cm)	8	2	-	10	-	-	-	0	10
Fundulus confluentus	1	-	-	1	-	-	1	1	2
Microgobius gulosus	1	-	-	1	-	1	-	1	2
Oreochromis aureus	1	-	-	1	-	-	-	0	1
Tilapia mariae	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	59	38	59	156	19	86	23	128	284
Mean				52				42.67	47.33
Net efficiency	0.7	1	1	0.9	0.9	0.9	1	0.93	0.92
Efficiency adjusted total	84.29	38	59	181.29	21.11	95.56	23	139.67	320.96
Efficiency adjusted Mean				60.43				46.56	53.49
Efficiency adjusted SE				13.382				24.508	12.867
Efficiency Adjusted variance				537.22				1801.9	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
2
Depth:
22
#Species:
58
Day:
12
Month:
11
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at TR in November 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	53	31	56	140	2	-	1	3	143
Cichlasoma urophthalmus	6	3	15	24	4	8	8	20	44
Gambusia holbrooki	2	4	13	19	6	-	3	9	28
Lophogobius cyprinoides	3	8	1	12	-	-	-	0	12
Poecilia latipinna	1	1	3	5	1	1	1	3	8
Microgobius gulosus	-	4	1	5	-	-	2	2	7
Cyprinodon variegatus	2	-	-	2	-	-	1	1	3
Tilapia mariae	1	1	1	3	-	-	-	0	3
Belonesox belizanus	-	-	-	0	1	-	1	2	2
Cichlasoma urophthalmus (>6.5 cm)	-	-	1	1	-	1	-	1	2
Gobiosoma bosci	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	68	53	91	212	14	10	17	41	253
Mean				70.67				13.67	42.17
Net efficiency	0.7	0.6	0.7	0.67	1	0.8	0.9	0.9	0.78
Efficiency adjusted total	97.14	88.33	130	315.47	14	12.5	18.89	45.39	360.86
Efficiency adjusted Mean				105.16				15.13	60.14
Efficiency adjusted SE				12.679				1.9292	20.932
Efficiency Adjusted variance				482.3				11.166	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
23
Salin:
0
Depth:
22
#Species:
58
Day:
8
Month:
11
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at BS in December 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	17	13	6	36	3	3	Sampled	6	42
Microgobius gulosus	9	2	7	18	3	1		4	22
Floridichthys carpio	-	-	-	0	-	3		3	3
Gambusia holbrooki	-	3	1	4	1	-		1	5
Fundulus grandis	-	-	1	1	1	-	Net	1	2
Cyprinodon variegatus	-	-	-	0	-	1		1	1
Fundulus grandis (>6.5 cm)	-	-	-	0	-	1		1	1
Poecilia latipinna	4	2	-	6	-	-	Not	0	6
Cichlasoma urophthalmus	-	-	1	1	-	-		0	1
Strongylura notata	-	1	-	1	-	-		0	1
Adinia xenica	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-		0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Fundulus chrysotus	-	-	-	0	-	-		0	0
Fundulus confluentus	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Lucania goodeii	-	-	-	0	-	-		0	0
Menidia peninsulae	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-	Sampled	0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	30	21	16	67	8	9		17	84
Mean				22.33				8.5	16.8
Net efficiency	0.8	0.8	0.8	0.8	1	0.9	0	0.95	0.86
Efficiency adjusted total	37.5	26.25	20	83.75	8	10		18	101.75
Efficiency adjusted Mean				27.92				9	20.35
Efficiency adjusted SE				5.1201				1	5.4254
Efficiency Adjusted variance				78.646				2	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
25
Salin:
14
Depth:
15
#Species:
56
Day:
22
Month:
12
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at HC in December 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	29	2	84	115	15	55	24	94	209
Poecilia latipinna	14	32	35	81	-	-	-	0	81
Fundulus confluentus	1	4	4	9	-	2	1	3	12
Cichlasoma urophthalmus	3	5	6	14	1	-	-	1	15
Fundulus grandis	-	6	1	7	-	1	-	1	8
Lucania parva	-	-	-	0	1	1	-	2	2
Fundulus grandis (>6.5 cm)	6	1	-	7	-	-	-	0	7
Adinia xenica	1	2	3	6	-	-	-	0	6
Gambusia holbrooki	1	1	-	2	-	-	-	0	2
Lucania goodeii	-	-	1	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	55	53	134	242	17	59	25	101	343
Mean				80.67				33.67	57.17
Net efficiency	0.9	0.7	1	0.87	1	0.9	1	0.97	0.92
Efficiency adjusted total	61.11	75.71	134	270.82	17	65.56	25	107.56	378.38
Efficiency adjusted Mean				90.27				35.85	63.06
Efficiency adjusted SE				22.266				15.032	17.1
Efficiency Adjusted variance				1487.3				677.86	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
19
Salin:
0
Depth:
18
#Species:
56
Day:
20
Month:
12
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at JB in December 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-		-	0	4	13	27	44	44
Lucania parva	28	Sampled	18	46	7	7	-	14	60
Cichlasoma urophthalmus	3		7	10	3	5	4	12	22
Poecilia latipinna	-	Not	-	0	-	-	7	7	7
Fundulus confluentus	1		-	1	-	4	-	4	5
Belonesox belizanus	1		-	1	-	1	-	1	2
Lucania goodeii	-		1	1	-	1	-	1	2
Lepomis punctatus	2		-	2	-	-	-	0	2
Microgobius gulosus	1		-	1	-	-	-	0	1
Adinia xenica	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Anchoa mitchili	-		-	0	-	-	-	0	0
Cichlasoma bimaculatum	-		-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-		-	0	-	-	-	0	0
Clarias batrachus	-		-	0	-	-	-	0	0
Cynoscion nebulosus	-		-	0	-	-	-	0	0
Elassoma evergladei	-		-	0	-	-	-	0	0
Elops saurus	-		-	0	-	-	-	0	0
Enneacanthus gloriosus	-		-	0	-	-	-	0	0
Erimyzon sucetta	-		-	0	-	-	-	0	0
Floridichthys carpio	-		-	0	-	-	-	0	0
Fundulus chrysotus	-		-	0	-	-	-	0	0
Fundulus grandis	-	Net	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-		-	0	-	-	-	0	0
Fundulus seminolis	-		-	0	-	-	-	0	0
Fundulus similis	-		-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-		-	0	-	-	-	0	0
Gambusia holbrooki	-		-	0	-	-	-	0	0
Gerridae spp.	-		-	0	-	-	-	0	0
Gobiosoma bosci	-		-	0	-	-	-	0	0
Gobiosoma robustum	-		-	0	-	-	-	0	0
Heterandria formosa	-		-	0	-	-	-	0	0
Jordanella floridae	-		-	0	-	-	-	0	0
Large Gerridae spp.	-		-	0	-	-	-	0	0
LARVAE	-		-	0	-	-	-	0	0
Lepomis gulosus	-		-	0	-	-	-	0	0
Lepomis macrochirus	-	Not	-	0	-	-	-	0	0
Lepomis marginatus	-		-	0	-	-	-	0	0
Lepomis micolophus	-	Net	-	0	-	-	-	0	0
Lepomis spp.	-		-	0	-	-	-	0	0
Lophogobius cyprinoides	-		-	0	-	-	-	0	0
Menidia peninsulae	-		-	0	-	-	-	0	0
Micropterus salmoides	-		-	0	-	-	-	0	0
Mugil cephalus	-		-	0	-	-	-	0	0
Notropis sp.	-		-	0	-	-	-	0	0
Noturus gyrinus	-	Sampled	-	0	-	-	-	0	0
Opsanus beta	-		-	0	-	-	-	0	0
Oreochromis aureus	-		-	0	-	-	-	0	0
Pogonias chromis	-		-	0	-	-	-	0	0
Scianops ocellatus	-		-	0	-	-	-	0	0
Sphyraena barracuda	-		-	0	-	-	-	0	0
Strongylura notata	-		-	0	-	-	-	0	0
Syngnathus louisianae	-		-	0	-	-	-	0	0
Tilapia mariae	-		-	0	-	-	-	0	0
Trinectes maculatus	-		-	0	-	-	-	0	0
Total	36		26	62	14	31	38	83	145
Mean				31				27.67	29
Net efficiency	0.6	0	1	0.8	0.9	1	0.6	0.83	0.82
Efficiency adjusted total	60		26	86	15.56	31	63.33	109.89	195.89
Efficiency adjusted Mean				43				36.63	39.18
Efficiency adjusted SE				17				14.074	9.5269
Efficiency Adjusted variance				578				594.27	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
27
Salin:
1
Depth:
24
#Species:
56
Day:
13
Month:
12
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at TR in December 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	Sampled	12	45	57	1	3	13	17	74
Cichlasoma urophthalmus		2	13	15	7	11	4	22	37
Poecilia latipinna	Not	-	2	2	15	10	6	31	33
Lophogobius cyprinoides		10	3	13	-	-	-	0	13
Cyprinodon variegatus		-	6	6	-	-	2	2	8
Gambusia holbrooki		-	3	3	4	1	-	5	8
Microgobius gulosus		2	2	4	-	-	-	0	4
Cichlasoma urophthalmus (>6.5 cm)		-	3	3	-	-	-	0	3
Lepomis punctatus		1	1	2	-	1	-	1	3
Gobiosoma robustum		2	-	2	-	-	-	0	2
Tilapia mariae		1	1	2	-	-	-	0	2
Belonesox belizanus		-	-	0	-	1	-	1	1
Fundulus grandis (>6.5 cm)		-	-	0	-	-	1	1	1
Adinia xenica		-	-	0	-	-	-	0	0
Ameirus natalis		-	-	0	-	-	-	0	0
Ameirus natalis		-	-	0	-	-	-	0	0
Anchoa mitchili		-	-	0	-	-	-	0	0
Cichlasoma bimaculatum		-	-	0	-	-	-	0	0
Clarias batrachus		-	-	0	-	-	-	0	0
Cynoscion nebulosus		-	-	0	-	-	-	0	0
Elassoma evergladei		-	-	0	-	-	-	0	0
Elops saurus		-	-	0	-	-	-	0	0
Enneacanthus gloriosus		-	-	0	-	-	-	0	0
Erimyzon sucetta		-	-	0	-	-	-	0	0
Floridichthys carpio		-	-	0	-	-	-	0	0
Fundulus chrysotus		-	-	0	-	-	-	0	0
Fundulus confluentus		-	-	0	-	-	-	0	0
Fundulus grandis	Net	-	-	0	-	-	-	0	0
Fundulus seminolis		-	-	0	-	-	-	0	0
Fundulus similis		-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0	-	-	-	0	0
Gerridae spp.		-	-	0	-	-	-	0	0
Gobiosoma bosci		-	-	0	-	-	-	0	0
Heterandria formosa		-	-	0	-	-	-	0	0
Jordanella floridae		-	-	0	-	-	-	0	0
Large Gerridae spp.		-	-	0	-	-	-	0	0
LARVAE		-	-	0	-	-	-	0	0
Lepomis gulosus		-	-	0	-	-	-	0	0
Lepomis macrochirus	Not	-	-	0	-	-	-	0	0
Lepomis marginatus		-	-	0	-	-	-	0	0
Lepomis micolophus	Net	-	-	0	-	-	-	0	0
Lepomis spp.		-	-	0	-	-	-	0	0
Lucania goodeii		-	-	0	-	-	-	0	0
Menidia peninsulae		-	-	0	-	-	-	0	0
Micropterus salmoides		-	-	0	-	-	-	0	0
Mugil cephalus		-	-	0	-	-	-	0	0
Notropis sp.		-	-	0	-	-	-	0	0
Noturus gyrinus	Sampled	-	-	0	-	-	-	0	0
Opsanus beta		-	-	0	-	-	-	0	0
Oreochromis aureus		-	-	0	-	-	-	0	0
Pogonias chromis		-	-	0	-	-	-	0	0
Scianops ocellatus		-	-	0	-	-	-	0	0
Sphyraena barracuda		-	-	0	-	-	-	0	0
Strongylura notata		-	-	0	-	-	-	0	0
Syngnathus louisianae		-	-	0	-	-	-	0	0
Trinectes maculatus		-	-	0	-	-	-	0	0
Total		30	79	109	27	27	26	80	189
Mean				54.5				26.67	37.8
Net efficiency	0	0.85	1	0.93	0.8	0.8	1	0.87	0.89
Efficiency adjusted total		35.29	79	114.29	33.75	33.75	26	93.5	207.79
Efficiency adjusted Mean				57.15				31.17	41.56
Efficiency adjusted SE				21.855				2.5833	9.5005
Efficiency Adjusted variance				955.28				20.021	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
22
Salin:
1
Depth:
28
#Species:
56
Day:
10
Month:
12
Year:
1997

Number of fish collected by species, summary statistics and physical parameters collected at BS in January 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	Sampled	18	Sampled	18	2	Sampled	16	18	36
Floridichthys carpio		2		2	4		4	8	10
Microgobius gulosus		1		1	1		1	2	3
Poecilia latipinna	Not	2	Not	2	-	Not	1	1	3
Cyprinodon variegatus		-		0	-		1	1	1
Adinia xenica		-		0	-		-	0	0
Ameirus natalis		-		0	-		-	0	0
Ameirus natalis		-		0	-		-	0	0
Anchoa mitchili		-		0	-		-	0	0
Belonesox belizanus		-		0	-		-	0	0
Cichlasoma bimaculatum		-		0	-		-	0	0
Cichlasoma urophthalmus		-		0	-		-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-		0	-		-	0	0
Clarias batrachus		-		0	-		-	0	0
Cynoscion nebulosus		-		0	-		-	0	0
Elassoma evergladei		-		0	-		-	0	0
Elops saurus		-		0	-		-	0	0
Enneacanthus gloriosus		-		0	-		-	0	0
Erimyzon sucetta		-		0	-		-	0	0
Fundulus chrysotus		-		0	-		-	0	0
Fundulus confluentus		-		0	-		-	0	0
Fundulus grandis	Net	-	Net	0	-	Net	-	0	0
Fundulus grandis (>6.5 cm)		-		0	-		-	0	0
Fundulus seminolis		-		0	-		-	0	0
Fundulus similis		-		0	-		-	0	0
Fundulus similis (>6.5 cm)		-		0	-		-	0	0
Gambusia holbrooki		-		0	-		-	0	0
Gerridae spp.		-		0	-		-	0	0
Gobiosoma bosci		-		0	-		-	0	0
Gobiosoma robustum		-		0	-		-	0	0
Heterandria formosa		-		0	-		-	0	0
Jordanella floridae		-		0	-		-	0	0
Large Gerridae spp.		-		0	-		-	0	0
LARVAE		-		0	-		-	0	0
Lepomis gulosus		-		0	-		-	0	0
Lepomis macrochirus	Not	-	Not	0	-	Not	-	0	0
Lepomis marginatus		-		0	-		-	0	0
Lepomis micolophus	Net	-	Net	0	-	Net	-	0	0
Lepomis punctatus		-		0	-		-	0	0
Lepomis spp.		-		0	-		-	0	0
Lophogobius cyprinoides		-		0	-		-	0	0
Lucania goodeii		-		0	-		-	0	0
Menidia peninsulae		-		0	-		-	0	0
Micropterus salmoides		-		0	-		-	0	0
Mugil cephalus		-		0	-		-	0	0
Notropis sp.		-		0	-		-	0	0
Noturus gyrinus	Sampled	-	Sampled	0	-	Sampled	-	0	0
Opsanus beta		-		0	-		-	0	0
Oreochromis aureus		-		0	-		-	0	0
Pogonias chromis		-		0	-		-	0	0
Scianops ocellatus		-		0	-		-	0	0
Sphyraena barracuda		-		0	-		-	0	0
Strongylura notata		-		0	-		-	0	0
Syngnathus louisianae		-		0	-		-	0	0
Tilapia mariae		-		0	-		-	0	0
Trinectes maculatus		-		0	-		-	0	0
Total		23		23	7		23	30	53
Mean				23				15	17.67
Net efficiency	0	0.78	0	0.78	0.83	0	0.83	0.83	0.81
Efficiency adjusted total		29.49		29.49	8.43		27.71	36.14	65.63
Efficiency adjusted Mean				29.49				18.07	21.88
Efficiency adjusted SE				0				9.64	6.7429
Efficiency Adjusted variance				0				185.86	

3 #NETS
1 #DEEP
2 #FLATS

Temp:
19
Salin:
12
Depth:
30
#Species:
56
Day:
10
Month:
2
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at HC in January 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	41	27	56	124	2		30	32	156
Fundulus confluentus	8	16	4	28	3		2	5	33
Adinia xenica	-	15	1	16	2		3	5	21
Fundulus grandis	2	2	2	6	4	Net	-	4	10
Poecilia latipinna	5	14	15	34	-	Not	-	0	34
Cichlasoma urophthalmus	1	-	1	2	-		3	3	5
Gambusia holbrooki	9	2	1	12	-		-	0	12
Lucania parva	-	-	1	1	-	Sampled	-	0	1
Ameirus natalis	-	-	-	0	-		-	0	0
Ameirus natalis	-	-	-	0	-		-	0	0
Anchoa mitchili	-	-	-	0	-		-	0	0
Belonesox belizanus	-	-	-	0	-		-	0	0
Cichlasoma bimaculatum	-	-	-	0	-		-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-		-	0	0
Clarias batrachus	-	-	-	0	-		-	0	0
Cynoscion nebulosus	-	-	-	0	-		-	0	0
Elassoma evergladei	-	-	-	0	-		-	0	0
Elops saurus	-	-	-	0	-		-	0	0
Enneacanthus gloriosus	-	-	-	0	-		-	0	0
Erimyzon sucetta	-	-	-	0	-		-	0	0
Floridichthys carpio	-	-	-	0	-		-	0	0
Fundulus chrysotus	-	-	-	0	-		-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-		-	0	0
Fundulus seminolis	-	-	-	0	-		-	0	0
Fundulus similis	-	-	-	0	-		-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-		-	0	0
Gerridae spp.	-	-	-	0	-		-	0	0
Gobiosoma bosci	-	-	-	0	-		-	0	0
Gobiosoma robustum	-	-	-	0	-		-	0	0
Heterandria formosa	-	-	-	0	-		-	0	0
Jordanella floridae	-	-	-	0	-		-	0	0
Large Gerridae spp.	-	-	-	0	-		-	0	0
LARVAE	-	-	-	0	-		-	0	0
Lepomis gulosus	-	-	-	0	-		-	0	0
Lepomis macrochirus	-	-	-	0	-	Not	-	0	0
Lepomis marginatus	-	-	-	0	-		-	0	0
Lepomis micolophus	-	-	-	0	-	Net	-	0	0
Lepomis punctatus	-	-	-	0	-		-	0	0
Lepomis spp.	-	-	-	0	-		-	0	0
Lophogobius cyprinoides	-	-	-	0	-		-	0	0
Lucania goodeii	-	-	-	0	-		-	0	0
Menidia peninsulae	-	-	-	0	-		-	0	0
Microgobius gulosus	-	-	-	0	-		-	0	0
Micropterus salmoides	-	-	-	0	-		-	0	0
Mugil cephalus	-	-	-	0	-		-	0	0
Notropis sp.	-	-	-	0	-		-	0	0
Noturus gyrinus	-	-	-	0	-	Sampled	-	0	0
Opsanus beta	-	-	-	0	-		-	0	0
Oreochromis aureus	-	-	-	0	-		-	0	0
Pogonias chromis	-	-	-	0	-		-	0	0
Scianops ocellatus	-	-	-	0	-		-	0	0
Sphyraena barracuda	-	-	-	0	-		-	0	0
Strongylura notata	-	-	-	0	-		-	0	0
Syngnathus louisianae	-	-	-	0	-		-	0	0
Tilapia mariae	-	-	-	0	-		-	0	0
Trinectes maculatus	-	-	-	0	-		-	0	0
Total	66	76	81	223	11		38	49	272
Mean				74.33				24.5	54.4
Net efficiency	0.8	0.8	1	0.87	1	0	1	1	0.92
Efficiency adjusted total	82.5	95	81	258.5	11		38	49	307.5
Efficiency adjusted Mean				86.17				24.5	61.5
Efficiency adjusted SE				4.4378				13.5	15.884
Efficiency Adjusted variance				59.083				364.5	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
20
Salin:
1
Depth:
12
#Species:
56
Day:
26
Month:
1
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at JB in January 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	3	8	11	-	31	2	33	44
Lucania parva	27	7	6	40	1	9	-	10	50
Poecilia latipinna	10	41	2	53	2	4	-	6	59
Cichlasoma urophthalmus	10	40	5	55	1	-	-	1	56
Gambusia holbrooki	8	-	-	8	-	4	-	4	12
Lepomis punctatus	5	11	-	16	-	-	-	0	16
Lucania goodeii	14	-	-	14	-	-	-	0	14
Adinia xenica	-	-	-	0	-	1	-	1	1
Fundulus confluentus	-	-	-	0	1	-	-	1	1
Lepomis spp.	1	-	-	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	75	102	21	198	5	49	2	56	254
Mean				66				18.67	42.33
Net efficiency	0.9	0.5	1	0.8	0.6	0.9	0.7	0.73	0.77
Efficiency adjusted total	83.33	204	21	308.33	8.33	54.44	2.86	65.63	373.96
Efficiency adjusted Mean				102.78				21.88	62.33
Efficiency adjusted SE				53.715				16.358	30.949
Efficiency Adjusted variance				8655.9				802.76	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
12
#Species:
56
Day:
20
Month:
1
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at TR in January 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	27	31	37	95	-	-	12	12	107
Cichlasoma urophthalmus	18	3	4	25	4	6	1	11	36
Poecilia latipinna	2	1	4	7	2	7	1	10	17
Lepomis punctatus	5	4	7	16	1	-	-	1	17
Gambusia holbrooki	-	-	6	6	3	1	1	5	11
Microgobius gulosus	1	6	4	11	-	-	-	0	11
Lophogobius cyprinoides	6	-	-	6	-	-	-	0	6
Gobiosoma robustum	2	1	-	3	-	-	-	0	3
Tilapia mariae	2	1	-	3	-	-	-	0	3
Cyprinodon variegatus	-	-	-	0	-	-	1	1	1
Fundulus confluentus	-	-	-	0	-	-	1	1	1
Lucania goodeii	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	64	47	62	173	10	14	17	41	214
Mean				57.67				13.67	35.67
Net efficiency	1	1	0.9	0.97	0.9	0.9	1	0.93	0.95
Efficiency adjusted total	64	47	68.89	179.89	11.11	15.56	17	43.67	223.56
Efficiency adjusted Mean				59.96				14.56	37.26
Efficiency adjusted SE				6.6336				1.7728	10.607
Efficiency Adjusted variance				132.01				9.4281	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
23
Salin:
0
Depth:
23
#Species:
56
Day:
12
Month:
1
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at BS in February 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	-	-	2	2	13	5	21	39	41
Lucania parva	72	10	2	84	1	1	8	10	94
Microgobius gulosus	3	5	-	8	1	-	-	1	9
Gerridae spp.	-	-	8	8	-	-	-	0	8
Cyprinodon variegatus	-	-	-	0	-	-	1	1	1
Menidia peninsulae	-	-	1	1	-	-	-	0	1
Strongylura notata	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	75	16	13	104	15	6	30	51	155
Mean				34.67				17	25.83
Net efficiency	0.67	0.78	0.72	0.72	0.83	0.88	0.83	0.85	0.78
Efficiency adjusted total	111.94	20.51	18.06	150.51	18.07	6.82	36.14	61.03	211.54
Efficiency adjusted Mean				50.17				20.34	35.26
Efficiency adjusted SE				30.893				8.5399	15.81
Efficiency Adjusted variance				2863.2				218.79	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
14
Depth:
18
#Species:
56
Day:
8
Month:
3
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at HC in February 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	23	9	11	43	15	17	12	44	87
Fundulus confluentus	-	5	1	6	2	3	3	8	14
Poecilia latipinna	1	14	3	18	-	-	-	0	18
Cichlasoma urophthalmus	1	3	3	7	-	-	1	1	8
Gambusia holbrooki	4	-	3	7	-	1	-	1	8
Lucania parva	3	3	2	8	-	-	-	0	8
Adinia xenica	-	1	-	1	-	-	-	0	1
Fundulus chrysotus	-	1	-	1	-	-	-	0	1
Lepomis punctatus	1	-	-	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	33	36	23	92	17	21	16	54	146
Mean				30.67				18	24.33
Net efficiency	0.9	0.8	1	0.9	0.8	0.95	1	0.92	0.91
Efficiency adjusted total	36.67	45	23	104.67	21.25	22.11	16	59.36	164.03
Efficiency adjusted Mean				34.89				19.79	27.34
Efficiency adjusted SE				6.4129				1.9095	4.5122
Efficiency Adjusted variance				123.38				10.939	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
15
#Species:
56
Day:
5
Month:
3
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at JB in February 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	-	4	4	-		5	5	9
Poecilia latipinna	1	19	-	20	1	Not	-	1	21
Fundulus confluentus	-	-	-	0	-		2	2	2
Cichlasoma urophthalmus	1	17	1	19	-		-	0	19
Lucania parva	15	1	3	19	-	Sampled	-	0	19
Lucania goodeii	13	-	3	16	-		-	0	16
Gambusia holbrooki	1	-	2	3	1		-	1	4
Lepomis punctatus	2	6	-	8	-		-	0	8
Belonesox belizanus	-	1	-	1	-		-	0	1
Cichlasoma urophthalmus (>6.5 cm)	-	1	-	1	-		-	0	1
Lepomis marginatus	-	1	-	1	-		-	0	1
Adinia xenica	-	-	-	0	-		-	0	0
Ameirus natalis	-	-	-	0	-		-	0	0
Ameirus natalis	-	-	-	0	-		-	0	0
Anchoa mitchili	-	-	-	0	-		-	0	0
Cichlasoma bimaculatum	-	-	-	0	-		-	0	0
Clarias batrachus	-	-	-	0	-		-	0	0
Cynoscion nebulosus	-	-	-	0	-		-	0	0
Elassoma evergladei	-	-	-	0	-		-	0	0
Elops saurus	-	-	-	0	-		-	0	0
Enneacanthus gloriosus	-	-	-	0	-		-	0	0
Erimyzon sucetta	-	-	-	0	-		-	0	0
Floridichthys carpio	-	-	-	0	-		-	0	0
Fundulus chrysotus	-	-	-	0	-		-	0	0
Fundulus grandis	-	-	-	0	-	Net	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-		-	0	0
Fundulus seminolis	-	-	-	0	-		-	0	0
Fundulus similis	-	-	-	0	-		-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-		-	0	0
Gerridae spp.	-	-	-	0	-		-	0	0
Gobiosoma bosci	-	-	-	0	-		-	0	0
Gobiosoma robustum	-	-	-	0	-		-	0	0
Heterandria formosa	-	-	-	0	-		-	0	0
Jordanella floridae	-	-	-	0	-		-	0	0
Large Gerridae spp.	-	-	-	0	-		-	0	0
LARVAE	-	-	-	0	-		-	0	0
Lepomis gulosus	-	-	-	0	-		-	0	0
Lepomis macrochirus	-	-	-	0	-	Not	-	0	0
Lepomis micolophus	-	-	-	0	-	Net	-	0	0
Lepomis spp.	-	-	-	0	-		-	0	0
Lophogobius cyprinoides	-	-	-	0	-		-	0	0
Menidia peninsulae	-	-	-	0	-		-	0	0
Microgobius gulosus	-	-	-	0	-		-	0	0
Micropterus salmoides	-	-	-	0	-		-	0	0
Mugil cephalus	-	-	-	0	-		-	0	0
Notropis sp.	-	-	-	0	-		-	0	0
Noturus gyrinus	-	-	-	0	-	Sampled	-	0	0
Opsanus beta	-	-	-	0	-		-	0	0
Oreochromis aureus	-	-	-	0	-		-	0	0
Pogonias chromis	-	-	-	0	-		-	0	0
Scianops ocellatus	-	-	-	0	-		-	0	0
Sphyraena barracuda	-	-	-	0	-		-	0	0
Strongylura notata	-	-	-	0	-		-	0	0
Syngnathus louisianae	-	-	-	0	-		-	0	0
Tilapia mariae	-	-	-	0	-		-	0	0
Trinectes maculatus	-	-	-	0	-		-	0	0
Total	33	46	13	92	2		7	9	101
Mean				30.67				4.5	20.2
Net efficiency	0.8	0.8	1	0.87	1	0	0.9	0.95	0.9
Efficiency adjusted total	41.25	57.5	13	111.75	2		7.78	9.78	121.53
Efficiency adjusted Mean				37.25				4.89	24.31
Efficiency adjusted SE				13.001				2.89	10.694
Efficiency Adjusted variance				507.06				16.704	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
23
Salin:
0
Depth:
17
#Species:
56
Day:
26
Month:
2
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at TR in February 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Poecilia latipinna	-	-	-	0	10	9	6	25	25
Lucania parva	1	6	9	16	-	-	2	2	18
Cichlasoma urophthalmus	4	1	2	7	3	3	2	8	15
Lepomis punctatus	4	5	-	9	-	-	-	0	9
Cyprinodon variegatus	-	-	-	0	-	1	4	5	5
Lophogobius cyprinoides	1	5	-	6	-	-	-	0	6
Microgobius gulosus	-	4	2	6	-	-	-	0	6
Menidia peninsulae	-	-	4	4	1	-	-	1	5
Gambusia holbrooki	-	1	-	1	-	3	-	3	4
Cichlasoma urophthalmus (>6.5 cm)	2	-	1	3	-	1	-	1	4
Fundulus confluentus	-	-	-	0	-	-	1	1	1
Lepomis marginatus	-	-	-	0	-	-	1	1	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	12	22	18	52	14	17	16	47	99
Mean				17.33				15.67	16.5
Net efficiency	0.8	1	0.7	0.83	0.9	0.9	1	0.93	0.88
Efficiency adjusted total	15	22	25.71	62.71	15.56	18.89	16	50.45	113.16
Efficiency adjusted Mean				20.9				16.82	18.86
Efficiency adjusted SE				3.14				1.0444	1.7393
Efficiency Adjusted variance				29.578				3.2724	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
0
Depth:
29
#Species:
56
Day:
19
Month:
2
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at BS in March 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	1	64	88	153				0	153
Lucania parva	34	5	7	46				0	46
Fundulus grandis	1	9	10	20	Net	Net	Net	0	20
Floridichthys carpio	14	2	3	19				0	19
Poecilia latipinna	2	-	6	8	Dry	Dry	Dry	0	8
Fundulus grandis (>6.5 cm)	-	2	3	5				0	5
Fundulus similis (>6.5 cm)	-	1	4	5				0	5
Fundulus similis	-	-	2	2				0	2
Gambusia holbrooki	2	-	-	2				0	2
Microgobius gulosus	2	-	-	2				0	2
Adinia xenica	1	-	-	1				0	1
Cichlasoma urophthalmus	1	-	-	1				0	1
Fundulus confluentus	-	-	1	1				0	1
Strongylura notata	1	-	-	1				0	1
Syngnathus scovelli	1	-	-	1				0	1
Ameirus natalis	-	-	-	0				0	0
Anchoa mitchili	-	-	-	0				0	0
Belonesox belizanus	-	-	-	0				0	0
Cichlasoma bimaculatum	-	-	-	0				0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0				0	0
Clarias batrachus	-	-	-	0	Dry	Dry	Dry	0	0
Cynoscion nebulosus	-	-	-	0				0	0
Elassoma evergladei	-	-	-	0				0	0
Elops saurus	-	-	-	0				0	0
Enneacanthus gloriosus	-	-	-	0				0	0
Erimyzon sucetta	-	-	-	0				0	0
Fundulus chrysotus	-	-	-	0				0	0
Fundulus seminolis	-	-	-	0				0	0
Gerridae spp.	-	-	-	0				0	0
Gobiosoma bosci	-	-	-	0				0	0
Gobiosoma robustum	-	-	-	0				0	0
Heterandria formosa	-	-	-	0				0	0
Ictalurus spp.	-	-	-	0				0	0
Jordanella floridae	-	-	-	0				0	0
Large Gerridae spp.	-	-	-	0				0	0
LARVAE	-	-	-	0				0	0
Lepisosteus platyrhincus	-	-	-	0				0	0
Lepomis gulosus	-	-	-	0				0	0
Lepomis macrochirus	-	-	-	0	Net	Net	Net	0	0
Lepomis marginatus	-	-	-	0				0	0
Lepomis micolophus	-	-	-	0				0	0
Lepomis punctatus	-	-	-	0				0	0
Lepomis spp.	-	-	-	0				0	0
Lophogobius cyprinoides	-	-	-	0				0	0
Lucania goodeii	-	-	-	0				0	0
Menidia peninsulae	-	-	-	0				0	0
Micropterus salmoides	-	-	-	0				0	0
Mugil cephalus	-	-	-	0				0	0
Notropis sp.	-	-	-	0				0	0
Noturus gyrinus	-	-	-	0				0	0
Opsanus beta	-	-	-	0				0	0
Oreochromis aureus	-	-	-	0				0	0
Pogonias chromis	-	-	-	0				0	0
Scianops ocellatus	-	-	-	0				0	0
Sphyraena barracuda	-	-	-	0				0	0
Syngnathus louisianae	-	-	-	0				0	0
Tilapia mariae	-	-	-	0				0	0
Trinectes maculatus	-	-	-	0				0	0
Total	60	83	124	267				0	267
Mean				89					89
Net efficiency	0.8	1	0.72	0.84	0	0	0		0.84
Efficiency adjusted total	75	83	172.22	330.22					330.22
Efficiency adjusted Mean				110.07					110.07
Efficiency adjusted SE				31.159					31.159
Efficiency Adjusted variance				2912.7				0	

3 #NETS
3 #DEEP
0 #FLATS

Temp:
25
Salin:
10
Depth:
-1
#Species:
58
Day:
4
Month:
4
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at HC in March 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	3	2	5	2	7	3	12	17
Fundulus confluentus	-	3	-	3	2	5	-	7	10
Gambusia holbrooki	1	3	-	4	1	-	-	1	5
Cichlasoma urophthalmus	1	1	2	4	-	-	-	0	4
Lucania parva	1	1	1	3	-	-	-	0	3
Poecilia latipinna	1	1	-	2	-	-	-	0	2
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	4	12	5	21	5	12	3	20	41
Mean				7				6.67	6.83
Net efficiency	1	0.9	1	0.97	0.8	1	1	0.93	0.95
Efficiency adjusted total	4	13.33	5	22.33	6.25	12	3	21.25	43.58
Efficiency adjusted Mean				7.44				7.08	7.26
Efficiency adjusted SE				2.9575				2.6313	1.7721
Efficiency Adjusted variance				26.24				20.771	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
0
Depth:
13
#Species:
58
Day:
1
Month:
4
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at JB in March 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	-	3	3	-	35	9	44	47
Lucania parva	17	1	-	18	-	1	-	1	19
Gambusia holbrooki	-	1	-	1	-	3	-	3	4
Poecilia latipinna	-	13	-	13	-	-	-	0	13
Cichlasoma urophthalmus	-	11	-	11	-	-	-	0	11
Lepomis punctatus	1	5	-	6	-	-	-	0	6
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	18	31	3	52	0	39	9	48	100
Mean				17.33				16	16.67
Net efficiency	1	0.9	1	0.97	1	0.9	1	0.97	0.97
Efficiency adjusted total	18	34.44	3	55.44	0	43.33	9	52.33	107.77
Efficiency adjusted Mean				18.48				17.44	17.96
Efficiency adjusted SE				9.0791				11.117	6.3752
Efficiency Adjusted variance				247.29				370.76	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
0
Depth:
16
#Species:
58
Day:
27
Month:
3
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at TR in March 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus		4	2	6	8	4	2	14	20
Lucania parva	Sampled	5	5	10	-	-	1	1	11
Poecilia latipinna	Not	1	1	2	-	4	-	4	6
Lepomis punctatus		1	3	4	-	-	-	0	4
Tilapia mariae		-	-	0	1	-	2	3	3
Lophogobius cyprinoides		2	-	2	-	-	-	0	2
Microgobius gulosus		2	-	2	-	-	-	0	2
Cyprinodon variegatus		-	1	1	-	-	1	1	2
Belonesox belizanus		1	-	1	-	-	-	0	1
Gambusia holbrooki		-	1	1	-	-	-	0	1
Lepomis marginatus		-	-	0	1	-	-	1	1
Adinia xenica		-	-	0	-	-	-	0	0
Ameirus natalis		-	-	0	-	-	-	0	0
Anchoa mitchili		-	-	0	-	-	-	0	0
Cichlasoma bimaculatum		-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-	-	0	-	-	-	0	0
Clarias batrachus	Sampled	-	-	0	-	-	-	0	0
Cynoscion nebulosus		-	-	0	-	-	-	0	0
Elassoma evergladei		-	-	0	-	-	-	0	0
Elops saurus		-	-	0	-	-	-	0	0
Enneacanthus gloriosus		-	-	0	-	-	-	0	0
Erimyzon sucetta		-	-	0	-	-	-	0	0
Floridichthys carpio		-	-	0	-	-	-	0	0
Fundulus chrysotus		-	-	0	-	-	-	0	0
Fundulus confluentus		-	-	0	-	-	-	0	0
Fundulus grandis	Net	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)		-	-	0	-	-	-	0	0
Fundulus seminolis		-	-	0	-	-	-	0	0
Fundulus similis		-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0	-	-	-	0	0
Gerridae spp.		-	-	0	-	-	-	0	0
Gobiosoma bosci		-	-	0	-	-	-	0	0
Gobiosoma robustum		-	-	0	-	-	-	0	0
Heterandria formosa		-	-	0	-	-	-	0	0
Ictalurus spp.		-	-	0	-	-	-	0	0
Jordanella floridae		-	-	0	-	-	-	0	0
Large Gerridae spp.		-	-	0	-	-	-	0	0
LARVAE		-	-	0	-	-	-	0	0
Lepisosteus platyrhincus		-	-	0	-	-	-	0	0
Lepomis gulosus		-	-	0	-	-	-	0	0
Lepomis macrochirus	Not	-	-	0	-	-	-	0	0
Lepomis micolophus	Net	-	-	0	-	-	-	0	0
Lepomis spp.		-	-	0	-	-	-	0	0
Lucania goodeii		-	-	0	-	-	-	0	0
Menidia peninsulae		-	-	0	-	-	-	0	0
Micropterus salmoides		-	-	0	-	-	-	0	0
Mugil cephalus		-	-	0	-	-	-	0	0
Notropis sp.		-	-	0	-	-	-	0	0
Noturus gyrinus		-	-	0	-	-	-	0	0
Opsanus beta		-	-	0	-	-	-	0	0
Oreochromis aureus		-	-	0	-	-	-	0	0
Pogonias chromis		-	-	0	-	-	-	0	0
Scianops ocellatus		-	-	0	-	-	-	0	0
Sphyraena barracuda		-	-	0	-	-	-	0	0
Strongylura notata		-	-	0	-	-	-	0	0
Syngnathus louisianae		-	-	0	-	-	-	0	0
Syngnathus scovelli		-	-	0	-	-	-	0	0
Trinectes maculatus		-	-	0	-	-	-	0	0
Total		16	13	29	10	8	6	24	53
Mean				14.5				8	10.6
Net efficiency	0	0.8	0.9	0.85	0.8	0.6	0.8	0.73	0.78
Efficiency adjusted total		20	14.44	34.44	12.5	13.33	7.5	33.33	67.77
Efficiency adjusted Mean				17.22				11.11	13.55
Efficiency adjusted SE				2.78				1.8208	2.0018
Efficiency Adjusted variance				15.457				9.9463	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
22
Salin:
2
Depth:
24
#Species:
58
Day:
24
Month:
3
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at BS in April 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	2	14	37	53	20	12	3	35	88
Lucania parva	42	15	10	67	3	2	1	6	73
Floridichthys carpio	2	1	2	5	7	-	-	7	12
Menidia peninsulae	3	-	15	18	-	-	-	0	18
Gerridae spp.	3	1	2	6	1	-	-	1	7
Strongylura notata	-	-	-	0	2	-	-	2	2
Microgobius gulosus	2	1	3	6	-	-	-	0	6
Opsanus beta	1	-	-	1	1	-	-	1	2
Fundulus grandis	-	2	-	2	-	-	-	0	2
Gambusia holbrooki	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	55	34	70	159	34	14	4	52	211
Mean				53				17.33	35.17
Net efficiency	0.9	1	1	0.97	0.9	1	0.8	0.9	0.93
Efficiency adjusted total	61.11	34	70	165.11	37.78	14	5	56.78	221.89
Efficiency adjusted Mean				55.04				18.93	36.98
Efficiency adjusted SE				10.827				9.7781	10.381
Efficiency Adjusted variance				351.66				286.84	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
28
Salin:
22
Depth:
10
#Species:
58
Day:
3
Month:
5
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at HC in April 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	6	39	64	109				0	109
Fundulus confluentus	18	25	16	59				0	59
Fundulus grandis	16	19	6	41	Net	Net	Net	0	41
Gambusia holbrooki	21	15	3	39				0	39
Poecilia latipinna	18	10	3	31	Dry	Dry	Dry	0	31
Adinia xenica	4	12	2	18				0	18
Fundulus grandis (>6.5 cm)	2	-	1	3				0	3
Belonesox belizanus	-	2	-	2				0	2
Jordanella floridae	1	-	-	1				0	1
Ameirus natalis	-	-	-	0				0	0
Anchoa mitchili	-	-	-	0				0	0
Cichlasoma bimaculatum	-	-	-	0				0	0
Cichlasoma urophthalmus	-	-	-	0				0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0				0	0
Clarias batrachus	-	-	-	0	Dry	Dry	Dry	0	0
Cynoscion nebulosus	-	-	-	0				0	0
Elassoma evergladei	-	-	-	0				0	0
Elops saurus	-	-	-	0				0	0
Enneacanthus gloriosus	-	-	-	0				0	0
Erimyzon sucetta	-	-	-	0				0	0
Floridichthys carpio	-	-	-	0				0	0
Fundulus chrysotus	-	-	-	0				0	0
Fundulus seminolis	-	-	-	0				0	0
Fundulus similis	-	-	-	0				0	0
Fundulus similis (>6.5 cm)	-	-	-	0				0	0
Gerridae spp.	-	-	-	0				0	0
Gobiosoma bosci	-	-	-	0				0	0
Gobiosoma robustum	-	-	-	0				0	0
Heterandria formosa	-	-	-	0				0	0
Ictalurus spp.	-	-	-	0				0	0
Large Gerridae spp.	-	-	-	0				0	0
LARVAE	-	-	-	0				0	0
Lepisosteus platyrhincus	-	-	-	0				0	0
Lepomis gulosus	-	-	-	0				0	0
Lepomis macrochirus	-	-	-	0	Net	Net	Net	0	0
Lepomis marginatus	-	-	-	0				0	0
Lepomis micolophus	-	-	-	0				0	0
Lepomis punctatus	-	-	-	0				0	0
Lepomis spp.	-	-	-	0				0	0
Lophogobius cyprinoides	-	-	-	0				0	0
Lucania goodeii	-	-	-	0				0	0
Lucania parva	-	-	-	0				0	0
Menidia peninsulae	-	-	-	0				0	0
Microgobius gulosus	-	-	-	0				0	0
Micropterus salmoides	-	-	-	0				0	0
Mugil cephalus	-	-	-	0				0	0
Notropis sp.	-	-	-	0				0	0
Noturus gyrinus	-	-	-	0				0	0
Opsanus beta	-	-	-	0				0	0
Oreochromis aureus	-	-	-	0				0	0
Pogonias chromis	-	-	-	0				0	0
Scianops ocellatus	-	-	-	0				0	0
Sphyraena barracuda	-	-	-	0				0	0
Strongylura notata	-	-	-	0				0	0
Syngnathus louisianae	-	-	-	0				0	0
Syngnathus scovelli	-	-	-	0				0	0
Tilapia mariae	-	-	-	0				0	0
Trinectes maculatus	-	-	-	0				0	0
Total	86	122	95	303				0	303
Mean				101					101
Net efficiency	1	0.9	0.9	0.93	0	0	0		0.93
Efficiency adjusted total	86	135.56	105.56	327.12					327.12
Efficiency adjusted Mean				109.04					109.04
Efficiency adjusted SE				14.412					14.412
Efficiency Adjusted variance				623.13				0	

3 #NETS
3 #DEEP
0 #FLATS

Temp:
24
Salin:
1
Depth:
3
#Species:
58
Day:
25
Month:
4
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at JB in April 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Poecilia latipinna	11	22	28	61	1	-	2	3	64
Cyprinodon variegatus	1	-	10	11	-	7	2	9	20
Fundulus confluentus	-	-	1	1	-	3	1	4	5
Cichlasoma urophthalmus	24	4	-	28	-	-	-	0	28
Lepomis punctatus	5	7	-	12	-	-	-	0	12
Lucania parva	11	1	-	12	-	-	-	0	12
Fundulus chrysotus	-	-	-	0	1	-	-	1	1
Heterandria formosa	-	-	-	0	1	-	-	1	1
Menidia peninsulae	-	-	3	3	-	-	-	0	3
Cichlasoma urophthalmus (>6.5 cm)	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	52	35	42	129	3	10	5	18	147
Mean				43				6	24.5
Net efficiency	1	0.6	0.9	0.83	0.9	1	1	0.97	0.9
Efficiency adjusted total	52	58.33	46.67	157	3.33	10	5	18.33	175.33
Efficiency adjusted Mean				52.33				6.11	29.22
Efficiency adjusted SE				3.3701				2.0039	10.484
Efficiency Adjusted variance				34.072				12.046	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
1
Depth:
10
#Species:
58
Day:
21
Month:
4
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at TR in April 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	38	20	29	87	1	1	-	2	89
Poecilia latipinna	2	-	4	6	1	1	8	10	16
Lepomis punctatus	6	3	1	10	-	-	-	0	10
Lophogobius cyprinoides	2	4	-	6	-	-	-	0	6
Lepomis marginatus	2	2	-	4	-	-	-	0	4
Cichlasoma urophthalmus (>6.5 cm)	1	1	1	3	-	-	-	0	3
Lucania parva	-	2	1	3	-	-	-	0	3
Belonesox belizanus	-	-	-	0	-	1	1	2	2
Cyprinodon variegatus	1	-	-	1	-	-	1	1	2
Micropterus salmoides	2	-	-	2	-	-	-	0	2
Jordanella floridae	-	-	-	0	-	-	1	1	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	54	32	36	122	2	3	11	16	138
Mean				40.67				5.33	23
Net efficiency	0.9	1	0.9	0.93	1	1	0.9	0.97	0.95
Efficiency adjusted total	60	32	40	132	2	3	12.22	17.22	149.22
Efficiency adjusted Mean				44				5.74	24.87
Efficiency adjusted SE				8.3267				3.2528	9.4432
Efficiency Adjusted variance				208				31.743	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
0
Depth:
10
#Species:
58
Day:
17
Month:
4
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at BS in June 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	3	15	18	3	22	22	47	65
Floridichthys carpio	-	13	5	18	2	3	-	5	23
Lucania parva	21	3	2	26	1	2	-	3	29
Menidia peninsulae	4	6	-	10	-	-	-	0	10
Gerridae spp.	-	3	5	8	-	-	-	0	8
Cichlasoma urophthalmus	-	-	1	1	-	1	-	1	2
Microgobius gulosus	3	1	1	5	-	-	-	0	5
Gambusia holbrooki	-	-	-	0	-	1	-	1	1
Opsanus beta	4	-	-	4	-	-	-	0	4
Fundulus grandis	-	1	2	3	-	-	-	0	3
Poecilia latipinna	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	33	30	31	94	6	29	22	57	151
Mean				31.33				19	25.17
Net efficiency	1	1	1	1	0.8	1	0.6	0.8	0.9
Efficiency adjusted total	33	30	31	94	7.5	29	36.67	73.17	167.17
Efficiency adjusted Mean				31.33				24.39	27.86
Efficiency adjusted SE				0.8819				8.7304	4.2202
Efficiency Adjusted variance				2.3334				228.66	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
21
Depth:
15
#Species:
58
Day:
27
Month:
6
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at HC in June 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	11	5	-	16	24	23	26	73	89
Poecilia latipinna	4	5	7	16	-	16	1	17	33
Fundulus confluentus	-	2	-	2	5	5	5	15	17
Fundulus grandis	-	1	-	1	-	4	7	11	12
Adinia xenica	-	-	-	0	-	7	-	7	7
Gambusia holbrooki	4	3	1	8	-	5	-	5	13
Jordanella floridae	-	-	-	0	-	3	-	3	3
Lucania parva	3	2	2	7	-	-	-	0	7
Fundulus grandis (>6.5 cm)	-	-	6	6	-	-	-	0	6
Cichlasoma urophthalmus	-	1	2	3	-	-	-	0	3
Belonesox belizanus	-	1	-	1	-	-	-	0	1
Cichlasoma urophthalmus (>6.5 cm)	1	-	-	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	23	20	18	61	29	63	39	131	192
Mean				20.33				43.67	32
Net efficiency	1	1	1	1	1	1	1	1	1
Efficiency adjusted total	23	20	18	61	29	63	39	131	192
Efficiency adjusted Mean				20.33				43.67	32
Efficiency adjusted SE				1.453				10.088	6.9282
Efficiency Adjusted variance				6.3333				305.33	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
32
Salin:
3
Depth:
8
#Species:
58
Day:
23
Month:
6
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at JB in June 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	-	-	0	2	17	7	26	26
Lucania parva	64	17	3	84	4	5	3	12	96
Poecilia latipinna	9	13	-	22	-	7	3	10	32
Fundulus confluentus	-	-	-	0	4	1	-	5	5
Gambusia holbrooki	-	2	-	2	-	-	4	4	6
Cichlasoma urophthalmus	2	5	2	9	1	1	1	3	12
Cichlasoma urophthalmus (>6.5 cm)	-	4	-	4	-	1	-	1	5
Belonesox belizanus	-	-	-	0	1	-	-	1	1
Menidia peninsulae	-	-	-	0	-	1	-	1	1
Lepomis punctatus	-	2	-	2	-	-	-	0	2
Tilapia mariae	1	1	-	2	-	-	-	0	2
Microgobius gulosus	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	77	44	5	126	12	33	18	63	189
Mean				42				21	31.5
Net efficiency	0.7	0.9	1	0.87	0.6	0.83	0.9	0.78	0.82
Efficiency adjusted total	110	48.89	5	163.89	20	39.76	20	79.76	243.65
Efficiency adjusted Mean				54.63				26.59	40.61
Efficiency adjusted SE				30.446				6.5867	15.277
Efficiency Adjusted variance				2781				130.15	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
32
Salin:
0
Depth:
14
#Species:
58
Day:
17
Month:
6
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at TR in June 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	32	13	19	64	1	-	-	1	65
Microgobius gulosus	8	41	-	49	1	-	-	1	50
Lucania parva	14	8	15	37	1	-	-	1	38
Menidia peninsulae	4	14	5	23	-	-	-	0	23
Poecilia latipinna	3	6	4	13	5	3	2	10	23
Cichlasoma urophthalmus (>6.5 cm)	9	5	6	20	-	-	-	0	20
Lophogobius cyprinoides	3	9	-	12	-	-	-	0	12
Tilapia mariae	2	2	2	6	-	-	-	0	6
Cyprinodon variegatus	-	-	-	0	6	1	-	7	7
Belonesox belizanus	-	-	-	0	4	1	-	5	5
Fundulus confluentus	-	-	-	0	-	1	2	3	3
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	75	98	51	224	18	6	4	28	252
Mean				74.67				9.33	42
Net efficiency	0.8	1	1	0.93	0.8	0.83	0.95	0.86	0.9
Efficiency adjusted total	93.75	98	51	242.75	22.5	7.23	4.21	33.94	276.69
Efficiency adjusted Mean				80.92				11.31	46.12
Efficiency adjusted SE				15.009				5.6609	17.137
Efficiency Adjusted variance				675.77				96.136	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
31
Salin:
10
Depth:
4
#Species:
58
Day:
12
Month:
6
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at BS in September 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	25	35	Sampled	60	7	9	8	24	84
Cyprinodon variegatus	5	10		15	11	16	7	34	49
Microgobius gulosus	6	3		9	5	5	3	13	22
Gerridae spp.	5	5		10	-	-	2	2	12
Cichlasoma urophthalmus	-	-		0	-	-	1	1	1
Gambusia holbrooki	1	-		1	-	-	-	0	1
Adinia xenica	-	-		0	-	-	-	0	0
Ameirus natalis	-	-		0	-	-	-	0	0
Anchoa mitchili	-	-		0	-	-	-	0	0
Belonesox belizanus	-	-		0	-	-	-	0	0
Cichlasoma bimaculatum	-	-		0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-		0	-	-	-	0	0
Clarias batrachus	-	-	Sampled	0	-	-	-	0	0
Cynoscion nebulosus	-	-		0	-	-	-	0	0
Elassoma evergladei	-	-		0	-	-	-	0	0
Elops saurus	-	-		0	-	-	-	0	0
Enneacanthus gloriosus	-	-		0	-	-	-	0	0
Erimyzon sucetta	-	-		0	-	-	-	0	0
Floridichthys carpio	-	-		0	-	-	-	0	0
Fundulus chrysotus	-	-		0	-	-	-	0	0
Fundulus confluentus	-	-		0	-	-	-	0	0
Fundulus grandis	-	-	Net	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-		0	-	-	-	0	0
Fundulus seminolis	-	-		0	-	-	-	0	0
Fundulus similis	-	-		0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-		0	-	-	-	0	0
Gobiosoma bosci	-	-		0	-	-	-	0	0
Gobiosoma robustum	-	-		0	-	-	-	0	0
Heterandria formosa	-	-		0	-	-	-	0	0
Ictalurus spp.	-	-		0	-	-	-	0	0
Jordanella floridae	-	-		0	-	-	-	0	0
Large Gerridae spp.	-	-		0	-	-	-	0	0
LARVAE	-	-		0	-	-	-	0	0
Lepisosteus platyrhincus	-	-		0	-	-	-	0	0
Lepomis gulosus	-	-		0	-	-	-	0	0
Lepomis macrochirus	-	-	Not	0	-	-	-	0	0
Lepomis marginatus	-	-		0	-	-	-	0	0
Lepomis micolophus	-	-	Net	0	-	-	-	0	0
Lepomis punctatus	-	-		0	-	-	-	0	0
Lepomis spp..	-	-		0	-	-	-	0	0
Lophogobius cyprinoides	-	-		0	-	-	-	0	0
Lucania goodeii	-	-		0	-	-	-	0	0
Menidia peninsulae	-	-		0	-	-	-	0	0
Micropterus salmoides	-	-		0	-	-	-	0	0
Mugil cephalus	-	-		0	-	-	-	0	0
Notropis sp.	-	-		0	-	-	-	0	0
Noturus gyrinus	-	-		0	-	-	-	0	0
Opsanus beta	-	-		0	-	-	-	0	0
Oreochromis aureus	-	-		0	-	-	-	0	0
Poecilia latipinna	-	-	Not	0	-	-	-	0	0
Pogonias chromis	-	-		0	-	-	-	0	0
Scianops ocellatus	-	-		0	-	-	-	0	0
Sphyraena barracuda	-	-		0	-	-	-	0	0
Strongylura notata	-	-		0	-	-	-	0	0
Syngnathus louisianae	-	-		0	-	-	-	0	0
Syngnathus scovelli	-	-		0	-	-	-	0	0
Tilapia mariae	-	-		0	-	-	-	0	0
Trinectes maculatus	-	-		0	-	-	-	0	0
Total	42	53		95	23	30	21	74	169
Mean				47.5				24.67	33.8
Net efficiency	1	1	0	1	0.82	0.8	0.73	0.78	0.87
Efficiency adjusted total	42	53		95	28.05	37.5	28.77	94.32	189.32
Efficiency adjusted Mean				47.5				31.44	37.86
Efficiency adjusted SE				5.5				3.0371	4.6117
Efficiency Adjusted variance				60.5				27.672	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
28
Salin:
7
Depth:
23
#Species:
58
Day:
9
Month:
10
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at HC in September 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	2	1	3	2	4	5	11	14
Cichlasoma urophthalmus	15	14	3	32	-	3	3	6	38
Fundulus confluentus	-	7	1	8	-	-	1	1	9
Lucania parva	1	13	-	14	-	-	-	0	14
Gambusia holbrooki	1	5	1	7	-	1	-	1	8
Lucania goodeii	-	-	1	1	-	1	-	1	2
Clarias batrachus	-	-	-	0	-	1	-	1	1
Cichlasoma urophthalmus (>6.5 cm)	2	-	-	2	-	-	-	0	2
Gerridae spp.	1	-	-	1	-	-	-	0	1
Lepomis punctatus	1	-	-	1	-	-	-	0	1
Poecilia latipinna	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	21	41	8	70	2	10	9	21	91
Mean				23.33				7	15.17
Net efficiency	0.6	0.85	1	0.82	1	0.8	0.5	0.77	0.79
Efficiency adjusted total	35	48.24	8	91.24	2	12.5	18	32.5	123.74
Efficiency adjusted Mean				30.41				10.83	20.62
Efficiency adjusted SE				11.841				4.6934	7.1843
Efficiency Adjusted variance				420.59				66.083	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
31
Salin:
0
Depth:
24
#Species:
58
Day:
6
Month:
10
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at JB in September 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	18	Sampled	7	25	10	1	9	20	45
Cichlasoma urophthalmus	7		6	13	5	1	6	12	25
Cyprinodon variegatus	-		-	0	8	2	2	12	12
Fundulus confluentus	-		-	0	1	-	1	2	2
Cichlasoma urophthalmus (>6.5 cm)	1		-	1	-	-	1	1	2
Gambusia holbrooki	2		-	2	-	-	-	0	2
Gobiosoma robustum	1		-	1	-	-	-	0	1
Lucania goodeii	-		1	1	-	-	-	0	1
Adinia xenica	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Anchoa mitchili	-		-	0	-	-	-	0	0
Belonesox belizanus	-		-	0	-	-	-	0	0
Cichlasoma bimaculatum	-		-	0	-	-	-	0	0
Clarias batrachus	-	Sampled	-	0	-	-	-	0	0
Cynoscion nebulosus	-		-	0	-	-	-	0	0
Elassoma evergladei	-		-	0	-	-	-	0	0
Elops saurus	-		-	0	-	-	-	0	0
Enneacanthus gloriosus	-		-	0	-	-	-	0	0
Erimyzon sucetta	-		-	0	-	-	-	0	0
Floridichthys carpio	-		-	0	-	-	-	0	0
Fundulus chrysotus	-		-	0	-	-	-	0	0
Fundulus grandis	-	Net	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-		-	0	-	-	-	0	0
Fundulus seminolis	-		-	0	-	-	-	0	0
Fundulus similis	-		-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-		-	0	-	-	-	0	0
Gerridae spp.	-		-	0	-	-	-	0	0
Gobiosoma bosci	-		-	0	-	-	-	0	0
Heterandria formosa	-		-	0	-	-	-	0	0
Ictalurus spp.	-		-	0	-	-	-	0	0
Jordanella floridae	-		-	0	-	-	-	0	0
Large Gerridae spp.	-		-	0	-	-	-	0	0
LARVAE	-		-	0	-	-	-	0	0
Lepisosteus platyrhincus	-		-	0	-	-	-	0	0
Lepomis gulosus	-		-	0	-	-	-	0	0
Lepomis macrochirus	-	Not	-	0	-	-	-	0	0
Lepomis marginatus	-		-	0	-	-	-	0	0
Lepomis micolophus	-	Net	-	0	-	-	-	0	0
Lepomis punctatus	-		-	0	-	-	-	0	0
Lepomis spp.	-		-	0	-	-	-	0	0
Lophogobius cyprinoides	-		-	0	-	-	-	0	0
Menidia peninsulae	-		-	0	-	-	-	0	0
Microgobius gulosus	-		-	0	-	-	-	0	0
Micropterus salmoides	-		-	0	-	-	-	0	0
Mugil cephalus	-		-	0	-	-	-	0	0
Notropis sp.	-		-	0	-	-	-	0	0
Noturus gyrinus	-		-	0	-	-	-	0	0
Opsanus beta	-		-	0	-	-	-	0	0
Oreochromis aureus	-		-	0	-	-	-	0	0
Poecilia latipinna	-	Not	-	0	-	-	-	0	0
Pogonias chromis	-		-	0	-	-	-	0	0
Scianops ocellatus	-		-	0	-	-	-	0	0
Sphyraena barracuda	-		-	0	-	-	-	0	0
Strongylura notata	-		-	0	-	-	-	0	0
Syngnathus louisianae	-		-	0	-	-	-	0	0
Syngnathus scovelli	-		-	0	-	-	-	0	0
Tilapia mariae	-		-	0	-	-	-	0	0
Trinectes maculatus	-		-	0	-	-	-	0	0
Total	29		14	43	24	4	19	47	90
Mean				21.5				15.67	18
Net efficiency	0.4	0	1	0.7	0.6	1	1	0.87	0.8
Efficiency adjusted total	72.5		14	86.5	40	4	19	63	149.5
Efficiency adjusted Mean				43.25				21	29.9
Efficiency adjusted SE				29.25				10.44	12.164
Efficiency Adjusted variance				1711.1				327	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
30
Salin:
0
Depth:
45
#Species:
58
Day:
22
Month:
9
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at TR in September 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	2	1	6	9	4	11	2	17	26
Lophogobius cyprinoides	3	4	-	7	-	-	-	0	7
Cichlasoma urophthalmus (>6.5 cm)	1	1	1	3	1	2	-	3	6
Poecilia latipinna	-	-	-	0	-	5	-	5	5
Cyprinodon variegatus	-	1	1	2	-	-	-	0	2
Fundulus similis (>6.5 cm)	-	-	-	0	1	-	-	1	1
Lucania parva	-	-	-	0	-	1	-	1	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	6	7	8	21	6	19	2	27	48
Mean				7				9	8
Net efficiency	0.8	0.8	0.6	0.73	1	0.6	0.95	0.85	0.79
Efficiency adjusted total	7.5	8.75	13.33	29.58	6	31.67	2.11	39.78	69.36
Efficiency adjusted Mean				9.86				13.26	11.56
Efficiency adjusted SE				1.7721				9.2732	4.2901
Efficiency Adjusted variance				9.4213				257.98	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
0
Depth:
27
#Species:
58
Day:
15
Month:
9
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at BS in November 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	1	4	2	7	33	9	18	60	67
Lucania parva	26	16	11	53	7	11	15	33	86
Microgobius gulosus	11	6	4	21	5	3	1	9	30
Poecilia latipinna	-	-	1	1	4	-	8	12	13
Gerridae spp.	13	-	-	13	-	-	2	2	15
Gambusia holbrooki	-	1	8	9	-	-	-	0	9
Adinia xenica	-	-	-	0	-	1	-	1	1
Cichlasoma urophthalmus	2	-	2	4	-	-	-	0	4
Floridichthys carpio	-	3	-	3	-	-	-	0	3
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	53	30	28	111	49	24	44	117	228
Mean				37				39	38
Net efficiency	0.6	0.6	0.67	0.69	0.82	0.8	0.8	0.81	0.75
Efficiency adjusted total	88.33	50	32.18	170.51	59.76	30	55	144.76	315.27
Efficiency adjusted Mean				56.84				48.25	52.54
Efficiency adjusted SE				16.566				9.2295	8.6951
Efficiency Adjusted variance				823.26				255.55	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
3
Depth:
6
#Species:
58
Day:
20
Month:
11
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at HC in November 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	23	1	-	24	43	15	5	63	87
Poecilia latipinna	3	-	-	3	-	17	8	25	28
Cichlasoma urophthalmus	24	15	10	49	1	12	4	17	66
Lucania parva	5	8	1	14	1	1	-	2	16
Fundulus confluentus	-	1	-	1	-	-	3	3	4
Adinia xenica	-	-	-	0	-	1	-	1	1
Cichlasoma urophthalmus (>6.5 cm)	3	-	1	4	-	-	-	0	4
Fundulus grandis (>6.5 cm)	-	-	4	4	-	-	-	0	4
Gerridae spp.	-	-	2	2	-	-	-	0	2
Lepomis spp.	1	-	-	1	-	-	-	0	1
Lucania goodei	-	1	-	1	-	-	-	0	1
Noturus gyrinus	1	-	-	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	60	26	18	104	45	46	20	111	215
Mean				34.67				37	35.83
Net efficiency	1	0.8	0.98	0.93	1	1	1	1	0.96
Efficiency adjusted total	60	32.5	18.37	110.87	45	46	20	111	221.87
Efficiency adjusted Mean				36.96				37	36.98
Efficiency adjusted SE				12.222				8.5049	6.6591
Efficiency Adjusted variance				448.16				217	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
31
Salin:
0
Depth:
18
#Species:
58
Day:
17
Month:
11
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at JB in November 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	44	9	17	70	5	15	7	27	97
Cyprinodon variegatus	3	-	2	5	1	10	4	15	20
Cichlasoma urophthalmus	7	17	7	31	4	2	5	11	42
Tilapia mariae	7	1	2	10	-	-	-	0	10
Belonesox belizanus	-	-	-	0	1	-	-	1	1
Microgobius gulosus	-	-	-	0	-	1	-	1	1
Cichlasoma urophthalmus (>6.5 cm)	-	3	-	3	-	-	-	0	3
Gerridae spp.	-	-	2	2	-	-	-	0	2
Lepomis punctatus	1	1	-	2	-	-	-	0	2
Gobiosoma robustum	-	-	1	1	-	-	-	0	1
Lucania goodeii	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	62	31	32	125	11	28	16	55	180
Mean				41.67				18.33	30
Net efficiency	0.8	0.78	0.98	0.85	1	0.85	0.92	0.92	0.89
Efficiency adjusted total	77.5	39.74	32.65	149.89	11	32.94	17.39	61.33	211.22
Efficiency adjusted Mean				49.96				20.44	35.2
Efficiency adjusted SE				13.92				6.5149	9.5295
Efficiency Adjusted variance				581.27				127.33	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
0
Depth:
30
#Species:
58
Day:
11
Month:
11
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at TR in November 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Tilapia mariae	6	1	8	15	1	-	6	7	22
Cichlasoma urophthalmus	-	-	3	3	5	7	-	12	15
Poecilia latipinna	-	-	-	0	-	6	-	6	6
Menidia peninsulae	-	-	5	5	-	-	-	0	5
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	3	-	3	3
Cyprinodon variegatus	1	-	-	1	1	-	1	2	3
Lucania goodeii	-	1	-	1	1	-	-	1	2
Lucania parva	2	-	-	2	-	-	-	0	2
Jordanella floridae	-	-	-	0	-	-	1	1	1
Microgobius gulosus	-	-	-	0	-	-	1	1	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	9	2	16	27	8	16	9	33	60
Mean				9				11	10
Net efficiency	1	0.9	0.6	0.83	0.6	0.4	0.95	0.65	0.74
Efficiency adjusted total	9	2.22	26.67	37.89	13.33	40	9.47	62.8	100.69
Efficiency adjusted Mean				12.63				20.93	16.78
Efficiency adjusted SE				7.2877				9.5982	5.7004
Efficiency Adjusted variance				159.33				276.38	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
42
#Species:
58
Day:
6
Month:
11
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at BS in December 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus		4	7	11	18	30	5	53	64
Lucania parva	Sampled	22	7	29	4	2	9	15	44
Gerridae spp.		-	3	3	2	6	-	8	11
Microgobius gulosus		1	3	4	5	-	1	6	10
Poecilia latipinna	Not	-	-	0	3	-	1	4	4
Cichlasoma urophthalmus		1	-	1	-	-	-	0	1
Adinia xenica		-	-	0	-	-	-	0	0
Ameirus natalis		-	-	0	-	-	-	0	0
Anchoa mitchili		-	-	0	-	-	-	0	0
Belonesox belizanus		-	-	0	-	-	-	0	0
Cichlasoma bimaculatum		-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-	-	0	-	-	-	0	0
Clarias batrachus	Sampled	-	-	0	-	-	-	0	0
Cynoscion nebulosus		-	-	0	-	-	-	0	0
Elassoma evergladei		-	-	0	-	-	-	0	0
Elops saurus		-	-	0	-	-	-	0	0
Enneacanthus gloriosus		-	-	0	-	-	-	0	0
Erimyzon sucetta		-	-	0	-	-	-	0	0
Floridichthys carpio		-	-	0	-	-	-	0	0
Fundulus chrysotus		-	-	0	-	-	-	0	0
Fundulus confluentus		-	-	0	-	-	-	0	0
Fundulus grandis	Net	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)		-	-	0	-	-	-	0	0
Fundulus seminolis		-	-	0	-	-	-	0	0
Fundulus similis		-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0	-	-	-	0	0
Gambusia holbrooki		-	-	0	-	-	-	0	0
Gobiosoma bosci		-	-	0	-	-	-	0	0
Gobiosoma robustum		-	-	0	-	-	-	0	0
Heterandria formosa		-	-	0	-	-	-	0	0
Ictalurus spp.		-	-	0	-	-	-	0	0
Jordanella floridae		-	-	0	-	-	-	0	0
Large Gerridae spp.		-	-	0	-	-	-	0	0
LARVAE		-	-	0	-	-	-	0	0
Lepisosteus platyrhincus		-	-	0	-	-	-	0	0
Lepomis gulosus		-	-	0	-	-	-	0	0
Lepomis macrochirus	Not	-	-	0	-	-	-	0	0
Lepomis marginatus		-	-	0	-	-	-	0	0
Lepomis micolophus	Net	-	-	0	-	-	-	0	0
Lepomis punctatus		-	-	0	-	-	-	0	0
Lepomis spp.		-	-	0	-	-	-	0	0
Lophogobius cyprinoides		-	-	0	-	-	-	0	0
Lucania goodeii		-	-	0	-	-	-	0	0
Menidia peninsulae		-	-	0	-	-	-	0	0
Micropterus salmoides		-	-	0	-	-	-	0	0
Mugil cephalus		-	-	0	-	-	-	0	0
Notropis sp.		-	-	0	-	-	-	0	0
Noturus gyrinus		-	-	0	-	-	-	0	0
Opsanus beta		-	-	0	-	-	-	0	0
Oreochromis aureus		-	-	0	-	-	-	0	0
Pogonias chromis		-	-	0	-	-	-	0	0
Scianops ocellatus		-	-	0	-	-	-	0	0
Sphyraena barracuda		-	-	0	-	-	-	0	0
Strongylura notata		-	-	0	-	-	-	0	0
Syngnathus louisianae		-	-	0	-	-	-	0	0
Syngnathus scovelli		-	-	0	-	-	-	0	0
Tilapia mariae		-	-	0	-	-	-	0	0
Trinectes maculatus		-	-	0	-	-	-	0	0
Total		28	20	48	32	38	16	86	134
Mean				24				28.67	26.8
Net efficiency	0	0.9	0.87	0.88	0.8	0.87	0.6	0.76	0.81
Efficiency adjusted total		31.11	22.99	54.1	40	43.68	26.67	110.35	164.45
Efficiency adjusted Mean				27.05				36.78	32.89
Efficiency adjusted SE				4.06				5.1671	3.9169
Efficiency Adjusted variance				32.967				80.095	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
23
Salin:
1000
Depth:
16
#Species:
58
Day:
21
Month:
12
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at HC in December 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	34	13	14	61	20	15		35	96
Fundulus confluentus	30	9	8	47	2	11		13	60
Poecilia latipinna	39	3	2	44	1	5	Not	6	50
Gambusia holbrooki	34	-	1	35	1	4		5	40
Adinia xenica	11	-	2	13	1	-		1	14
Cichlasoma urophthalmus	2	4	2	8	-	1		1	9
Belonesox belizanus	-	-	-	0	-	1		1	1
Lucania parva	1	2	-	3	-	-	Sampled	0	3
Microgobius gulosus	-	-	1	1	-	-		0	1
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-	Sampled	0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus chrysotus	-	-	-	0	-	-		0	0
Fundulus grandis	-	-	-	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Ictalurus spp.	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepisosteus platyrhincus	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Lucania goodeii	-	-	-	0	-	-		0	0
Menidia peninsulae	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-		0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Syngnathus scovelli	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	151	31	30	212	25	37		62	274
Mean				70.67				31	54.8
Net efficiency	0.6	1	0.98	0.86	1	0.9	0	0.95	0.9
Efficiency adjusted total	251.67	31	30.61	313.28	25	41.11		66.11	379.39
Efficiency adjusted Mean				104.43				33.06	75.88
Efficiency adjusted SE				73.622				8.055	44.025
Efficiency Adjusted variance				16260				129.77	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
31
Salin:
1
Depth:
10
#Species:
58
Day:
18
Month:
12
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at JB in December 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	50	83	8	141	-	2	1	3	144
Lucania parva	30	2	3	35	5	5	1	11	46
Poecilia latipinna	2	10	25	37	-	-	-	0	37
Cyprinodon variegatus	-	1	-	1	-	3	-	3	4
Fundulus confluentus	-	-	-	0	1	1	-	2	2
Cichlasoma urophthalmus (>6.5 cm)	4	2	3	9	-	-	-	0	9
Belonesox belizanus	-	3	-	3	-	-	-	0	3
Gerridae spp.	-	-	3	3	-	-	-	0	3
Gambusia holbrooki	-	2	-	2	-	-	-	0	2
Lepomis spp.	-	2	-	2	-	-	-	0	2
Tilapia mariae	-	1	1	2	-	-	-	0	2
Clarias batrachus	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	86	107	43	236	6	11	2	19	255
Mean				78.67				6.33	42.5
Net efficiency	0.8	0.6	1	0.8	0.9	1	0.9	0.93	0.87
Efficiency adjusted total	107.5	178.33	43	328.83	6.67	11	2.22	19.89	348.72
Efficiency adjusted Mean				109.61				6.63	58.12
Efficiency adjusted SE				39.081				2.5346	28.931
Efficiency Adjusted variance				4581.9				19.273	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
23
Salin:
0
Depth:
10
#Species:
58
Day:
11
Month:
12
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at TR in December 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Tilapia mariae	9	8	12	29	-	-	-	0	29
Lucania goodeii	6	3	12	21	3	-	1	4	25
Cichlasoma urophthalmus	-	1	1	2	4	2	-	6	8
Lucania parva	8	1	-	9	-	-	-	0	9
Poecilia latipinna	-	-	-	0	-	2	1	3	3
Menidia peninsulae	-	1	-	1	-	2	-	2	3
Cyprinodon variegatus	2	-	-	2	-	1	-	1	3
Cichlasoma urophthalmus (>6.5 cm)	-	-	1	1	-	-	-	0	1
Microgobius gulosus	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	25	15	26	66	7	7	2	16	82
Mean				22				5.33	13.67
Net efficiency	0.8	0.9	1	0.9	1	0.8	0.95	0.92	0.91
Efficiency adjusted total	31.25	16.67	26	73.92	7	8.75	2.11	17.86	91.78
Efficiency adjusted Mean				24.64				5.95	15.3
Efficiency adjusted SE				4.2635				1.987	4.6781
Efficiency Adjusted variance				54.531				11.844	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
24
#Species:
58
Day:
8
Month:
12
Year:
1998

Number of fish collected by species, summary statistics and physical parameters collected at BS in January 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	9	32	159	200	43	28	1	72	272
Lucania parva	2	7	9	18	3	5	11	19	37
Strongylura notata	23	-	2	25	-	-	-	0	25
Poecilia latipinna	-	2	2	4	-	1	3	4	8
Microgobius gulosus	5	-	1	6	-	1	-	1	7
Adinia xenica	-	-	-	0	-	1	-	1	1
Gambusia holbrooki	-	-	-	0	-	-	1	1	1
Fundulus grandis	-	-	1	1	-	-	-	0	1
Fundulus grandis (>6.5 cm)	-	-	1	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Cyprinodon variegatus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	39	41	175	255	46	36	16	98	353
Mean				85				32.67	58.83
Net efficiency	0.4	1	0.87	0.76	0.82	1	0.6	0.81	0.78
Efficiency adjusted total	97.5	41	201.15	339.65	56.1	36	26.67	118.77	458.42
Efficiency adjusted Mean				113.22				39.59	76.4
Efficiency adjusted SE				46.894				8.6833	26.943
Efficiency Adjusted variance				6597.3				226.2	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
21
Salin:
23
Depth:
2
#Species:
58
Day:
30
Month:
1
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at HC in January 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	84	15	48	147	74	68	53	195	342
Fundulus confluentus	18	4	9	31	30	19	17	66	97
Gambusia holbrooki	82	-	2	84	-	2	2	4	88
Adinia xenica	21	1	2	24	1	9	1	11	35
Poecilia latipinna	12	11	8	31	-	-	-	0	31
Jordanella floridae	-	-	-	0	-	-	3	3	3
Lucania goodeii	-	-	1	1	-	-	1	1	2
Fundulus chrysotus	-	-	-	0	-	-	1	1	1
Fundulus grandis	-	-	3	3	-	-	-	0	3
Fundulus grandis (>6.5 cm)	-	-	3	3	-	-	-	0	3
Heterandria formosa	-	1	-	1	-	-	-	0	1
Lucania parva	1	-	-	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	218	32	76	326	105	98	78	281	607
Mean				108.67				93.67	101.17
Net efficiency	1	0.7	1	0.9	1	1	0.92	0.97	0.94
Efficiency adjusted total	218	45.71	76	339.71	105	98	84.78	287.78	627.49
Efficiency adjusted Mean				113.24				95.93	104.58
Efficiency adjusted SE				53.106				5.9284	24.209
Efficiency Adjusted variance				8460.9				105.44	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
0
Depth:
9
#Species:
58
Day:
27
Month:
1
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at JB in January 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	-	-	0	1	23	6	30	30
Lucania parva	46	7	-	53	-	10	2	12	65
Gambusia holbrooki	8	7	3	18	-	6	-	6	24
Heterandria formosa	7	-	4	11	3	1	1	5	16
Poecilia latipinna	-	9	-	9	-	2	-	2	11
Fundulus confluentus	-	-	-	0	2	-	1	3	3
Lucania goodeii	3	2	8	13	-	-	1	1	14
Cichlasoma urophthalmus	1	5	-	6	-	1	-	1	7
Menidia peninsulae	5	-	7	12	-	-	-	0	12
Lepomis spp.	1	9	-	10	-	-	-	0	10
Cichlasoma urophthalmus (>6.5 cm)	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	71	40	22	133	6	43	11	60	193
Mean				44.33				20	32.17
Net efficiency	1	0.9	1	0.97	0.6	1	1	0.87	0.92
Efficiency adjusted total	71	44.44	22	137.44	10	43	11	64	201.44
Efficiency adjusted Mean				45.81				21.33	33.57
Efficiency adjusted SE				14.162				10.837	9.6728
Efficiency Adjusted variance				601.66				352.33	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
21
Salin:
0
Depth:
15
#Species:
58
Day:
21
Month:
1
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at TR in January 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	21	20	22	63	-	2	-	2	65
Lucania goodeii	10	18	7	35	6	8	10	24	59
Lucania parva	6	3	-	9	3	-	2	5	14
Cyprinodon variegatus	1	-	-	1	3	1	7	11	12
Cichlasoma urophthalmus (>6.5 cm)	6	2	5	13	-	-	-	0	13
Menidia peninsulae	-	12	-	12	-	-	-	0	12
Gambusia holbrooki	-	-	-	0	4	2	3	9	9
Poecilia latipinna	-	-	-	0	-	2	5	7	7
Lepomis spp.	-	-	3	3	-	-	-	0	3
Heterandria formosa	-	-	-	0	1	1	-	2	2
Microgobius gulosus	-	2	-	2	-	-	-	0	2
Lophogobius cyprinoides	1	-	-	1	-	-	-	0	1
Tilapia mariae	-	1	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	45	58	37	140	17	16	27	60	200
Mean				46.67				20	33.33
Net efficiency	1	1	0.8	0.93	0.9	0.72	1	0.87	0.9
Efficiency adjusted total	45	58	46.25	149.25	18.89	22.22	27	68.11	217.36
Efficiency adjusted Mean				49.75				22.7	36.23
Efficiency adjusted SE				4.1408				2.3536	6.412
Efficiency Adjusted variance				51.437				16.618	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
20
Salin:
0
Depth:
22
#Species:
58
Day:
16
Month:
1
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at BS in February 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio		2	-	2		26	3	29	31
Lucania parva	Sampled	11	1	12	Sampled	7	12	19	31
Poecilia latipinna	Not	-	12	12	Not	-	1	1	13
Gerridae spp.		-	5	5		-	-	0	5
Gambusia holbrooki		1	-	1		-	-	0	1
Microgobius gulosus		-	1	1		-	-	0	1
Adinia xenica		-	-	0		-	-	0	0
Ameirus natalis		-	-	0		-	-	0	0
Anchoa mitchili		-	-	0		-	-	0	0
Belonesox belizanus		-	-	0		-	-	0	0
Cichlasoma bimaculatum		-	-	0		-	-	0	0
Cichlasoma urophthalmus		-	-	0		-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-	-	0		-	-	0	0
Clarias batrachus	Sampled	-	-	0	Sampled	-	-	0	0
Cynoscion nebulosus		-	-	0		-	-	0	0
Cyprinodon variegatus		-	-	0		-	-	0	0
Elassoma evergladei		-	-	0		-	-	0	0
Elops saurus		-	-	0		-	-	0	0
Enneacanthus gloriosus		-	-	0		-	-	0	0
Erimyzon sucetta		-	-	0		-	-	0	0
Fundulus chrysotus		-	-	0		-	-	0	0
Fundulus confluentus		-	-	0		-	-	0	0
Fundulus grandis	Net	-	-	0	Net	-	-	0	0
Fundulus grandis (>6.5 cm)		-	-	0		-	-	0	0
Fundulus seminolis		-	-	0		-	-	0	0
Fundulus similis		-	-	0		-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0		-	-	0	0
Gobiosoma bosci		-	-	0		-	-	0	0
Gobiosoma robustum		-	-	0		-	-	0	0
Heterandria formosa		-	-	0		-	-	0	0
Ictalurus spp.		-	-	0		-	-	0	0
Jordanella floridae		-	-	0		-	-	0	0
Large Gerridae spp.		-	-	0		-	-	0	0
LARVAE		-	-	0		-	-	0	0
Lepisosteus platyrhincus		-	-	0		-	-	0	0
Lepomis gulosus		-	-	0		-	-	0	0
Lepomis macrochirus	Not	-	-	0	Not	-	-	0	0
Lepomis marginatus		-	-	0		-	-	0	0
Lepomis micolophus	Net	-	-	0	Net	-	-	0	0
Lepomis punctatus		-	-	0		-	-	0	0
Lepomis spp.		-	-	0		-	-	0	0
Lophogobius cyprinoides		-	-	0		-	-	0	0
Lucania goodeii		-	-	0		-	-	0	0
Menidia peninsulae		-	-	0		-	-	0	0
Micropterus salmoides		-	-	0		-	-	0	0
Mugil cephalus		-	-	0		-	-	0	0
Notropis sp.		-	-	0		-	-	0	0
Noturus gyrinus		-	-	0		-	-	0	0
Opsanus beta		-	-	0		-	-	0	0
Oreochromis aureus		-	-	0		-	-	0	0
Pogonias chromis		-	-	0		-	-	0	0
Scianops ocellatus		-	-	0		-	-	0	0
Sphyraena barracuda		-	-	0		-	-	0	0
Strongylura notata		-	-	0		-	-	0	0
Syngnathus louisianae		-	-	0		-	-	0	0
Syngnathus scovelli		-	-	0		-	-	0	0
Tilapia mariae		-	-	0		-	-	0	0
Trinectes maculatus		-	-	0		-	-	0	0
Total		14	19	33		33	16	49	82
Mean				16.5				24.5	20.5
Net efficiency	0	0.8	0.87	0.84	0	0.92	1	0.96	0.9
Efficiency adjusted total		17.5	21.84	39.34		35.87	16	51.87	91.21
Efficiency adjusted Mean				19.67				25.93	22.8
Efficiency adjusted SE				2.17				9.935	4.5284
Efficiency Adjusted variance				9.4178				197.41	

4 #NETS
2 #DEEP
2 #FLATS

Temp:
20
Salin:
1000
Depth:
20
#Species:
58
Day:
3
Month:
3
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at HC in February 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	97	38	21	156	43	28	5	76	232
Fundulus confluentus	8	7	3	18	3	5	-	8	26
Poecilia latipinna	19	28	4	51	1	-	-	1	52
Gambusia holbrooki	4	3	2	9	-	2	-	2	11
Adinia xenica	-	-	-	0	1	2	-	3	3
Lucania parva	2	4	2	8	-	-	1	1	9
Fundulus grandis (>6.5 cm)	1	-	-	1	-	-	-	0	1
Lucania goodeii	-	-	1	1	-	-	-	0	1
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	131	80	33	244	48	37	6	91	335
Mean				81.33				30.33	55.83
Net efficiency	0.9	1	1	0.97	1	1	0.9	0.97	0.97
Efficiency adjusted total	145.56	80	33	258.56	48	37	6.67	91.67	350.23
Efficiency adjusted Mean				86.19				30.56	58.37
Efficiency adjusted SE				32.64				12.358	19.959
Efficiency Adjusted variance				3196.1				458.18	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
19
Salin:
10
Depth:
18
#Species:
58
Day:
1
Month:
3
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at JB in February 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	50	18	11	79	5	24	10	39	118
Cyprinodon variegatus	-	-	8	8	5	18	3	26	34
Gambusia holbrooki	2	1	2	5	1	1	9	11	16
Lucania goodeii	3	7	9	19	-	3	1	4	23
Poecilia latipinna	-	37	-	37	-	-	-	0	37
Heterandria formosa	1	4	2	7	2	1	1	4	11
Fundulus confluentus	-	-	-	0	1	2	-	3	3
Jordanella floridae	-	-	-	0	-	2	1	3	3
Fundulus similis	-	-	-	0	-	2	-	2	2
Lepomis punctatus	2	9	-	11	-	-	-	0	11
Microgobius gulosus	1	-	-	1	-	1	-	1	2
Cichlasoma urophthalmus	3	2	-	5	-	-	-	0	5
Menidia peninsulae	-	-	2	2	-	-	-	0	2
Belonesox belizanus	-	1	-	1	-	-	-	0	1
Cichlasoma urophthalmus (>6.5 cm)	1	-	-	1	-	-	-	0	1
Lepomis spp.	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	64	79	34	177	14	54	25	93	270
Mean				59				31	45
Net efficiency	0.8	0.8	1	0.87	0.8	1	0.9	0.9	0.88
Efficiency adjusted total	80	98.75	34	212.75	17.5	54	27.78	99.28	312.03
Efficiency adjusted Mean				70.92				33.09	52
Efficiency adjusted SE				19.236				10.866	13.006
Efficiency Adjusted variance				1110				354.24	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
16
Salin:
15
Depth:
15
#Species:
58
Day:
26
Month:
2
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at TR in February 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	37	22	21	80	-	-	-	0	80
Lucania goodeii	1	23	10	34	20	5	6	31	65
Heterandria formosa	1	-	1	2	26	3	-	29	31
Cyprinodon variegatus	-	-	-	0	15	1	2	18	18
Cichlasoma urophthalmus (>6.5 cm)	8	-	4	12	-	-	-	0	12
Lepomis spp.	5	5	2	12	-	-	-	0	12
Jordanella floridae	-	1	-	1	5	-	2	7	8
Lucania parva	2	4	2	8	-	-	-	0	8
Microgobius gulosus	1	6	1	8	-	-	-	0	8
Gambusia holbrooki	-	-	-	0	5	1	-	6	6
Menidia peninsulae	4	-	-	4	-	-	2	2	6
Poecilia latipinna	4	-	1	5	-	-	-	0	5
Fundulus confluentus	-	-	-	0	1	-	1	2	2
Lepomis punctatus	-	-	1	1	-	-	-	0	1
Noturus gyrinus	-	-	1	1	-	-	-	0	1
Tilapia mariae	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	63	61	45	169	72	10	13	95	264
Mean				56.33				31.67	44
Net efficiency	0.9	0.9	1	0.93	1	0.9	0.9	0.93	0.93
Efficiency adjusted total	70	67.78	45	182.78	72	11.11	14.44	97.55	280.33
Efficiency adjusted Mean				60.93				32.52	46.72
Efficiency adjusted SE				7.9891				19.765	11.457
Efficiency Adjusted variance				191.48				1172	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
16
#Species:
58
Day:
18
Month:
2
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at BS in March 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	34		14	48	24	156		180	228
Fundulus confluentus	-		-	0	8	48		56	56
Lucania parva	34	Sampled	11	45	3	9	Sampled	12	57
Poecilia latipinna	6	Not	5	11	2	6	Not	8	19
Adinia xenica	-		-	0	8	-		8	8
Gambusia holbrooki	-		-	0	2	1		3	3
Fundulus grandis (>6.5 cm)	-		1	1	-	-		0	1
Gerridae spp.	-		1	1	-	-		0	1
Ameirus natalis	-		-	0	-	-		0	0
Anchoa mitchili	-		-	0	-	-		0	0
Belonesox belizanus	-		-	0	-	-		0	0
Cichlasoma bimaculatum	-		-	0	-	-		0	0
Cichlasoma urophthalmus	-		-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-		-	0	-	-		0	0
Clarias batrachus	-	Sampled	-	0	-	-	Sampled	0	0
Cynoscion nebulosus	-		-	0	-	-		0	0
Elassoma evergladei	-		-	0	-	-		0	0
Elops saurus	-		-	0	-	-		0	0
Enneacanthus gloriosus	-		-	0	-	-		0	0
Erimyzon sucetta	-		-	0	-	-		0	0
Floridichthys carpio	-		-	0	-	-		0	0
Fundulus chrysotus	-		-	0	-	-		0	0
Fundulus grandis	-	Net	-	0	-	-	Net	0	0
Fundulus seminolis	-		-	0	-	-		0	0
Fundulus similis	-		-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-		-	0	-	-		0	0
Gobiosoma bosci	-		-	0	-	-		0	0
Gobiosoma robustum	-		-	0	-	-		0	0
Heterandria formosa	-		-	0	-	-		0	0
Ictalurus spp.	-		-	0	-	-		0	0
Jordanella floridae	-		-	0	-	-		0	0
Large Gerridae spp.	-		-	0	-	-		0	0
LARVAE	-		-	0	-	-		0	0
Lepisosteus platyrhincus	-		-	0	-	-		0	0
Lepomis gulosus	-		-	0	-	-		0	0
Lepomis macrochirus	-	Not	-	0	-	-	Not	0	0
Lepomis marginatus	-		-	0	-	-		0	0
Lepomis micolophus	-	Net	-	0	-	-	Net	0	0
Lepomis punctatus	-		-	0	-	-		0	0
Lepomis spp.	-		-	0	-	-		0	0
Lophogobius cyprinoides	-		-	0	-	-		0	0
Lucania goodeii	-		-	0	-	-		0	0
Menidia peninsulae	-		-	0	-	-		0	0
Microgobius gulosus	-		-	0	-	-		0	0
Micropterus salmoides	-		-	0	-	-		0	0
Mugil cephalus	-		-	0	-	-		0	0
Notropis sp.	-		-	0	-	-		0	0
Noturus gyrinus	-		-	0	-	-		0	0
Opsanus beta	-		-	0	-	-		0	0
Oreochromis aureus	-		-	0	-	-		0	0
Pogonias chromis	-		-	0	-	-		0	0
Scianops ocellatus	-		-	0	-	-		0	0
Sphyraena barracuda	-		-	0	-	-		0	0
Strongylura notata	-		-	0	-	-		0	0
Syngnathus louisianae	-		-	0	-	-		0	0
Syngnathus scovelli	-		-	0	-	-		0	0
Tilapia mariae	-		-	0	-	-		0	0
Trinectes maculatus	-		-	0	-	-		0	0
Total	74		32	106	47	220		267	373
Mean				53				133.5	93.25
Net efficiency	0.8	0	0.87	0.84	0.8	0.92	0	0.86	0.85
Efficiency adjusted total	92.5		36.78	129.28	58.75	239.13		297.88	427.16
Efficiency adjusted Mean				64.64				148.94	106.79
Efficiency adjusted SE				27.86				90.19	45.577
Efficiency Adjusted variance				1552.4				16268	

4 #NETS
2 #DEEP
2 #FLATS

Temp:
20
Salin:
37
Depth:
4
#Species:
58
Day:
30
Month:
3
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at HC in March 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	163	26	195	384				0	384
Fundulus confluentus	122	50	26	198				0	198
Adinia xenica	32	-	44	76				0	76
Gambusia holbrooki	19	9	4	32				0	32
Poecilia latipinna	7	-	-	7	Dry	Dry	Dry	0	7
Jordanella floridae	2	-	1	3				0	3
Ameirus natalis	-	-	-	0				0	0
Anchoa mitchili	-	-	-	0				0	0
Belonesox belizanus	-	-	-	0				0	0
Cichlasoma bimaculatum	-	-	-	0				0	0
Cichlasoma urophthalmus	-	-	-	0				0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0				0	0
Clarias batrachus	-	-	-	0	Dry	Dry	Dry	0	0
Cynoscion nebulosus	-	-	-	0				0	0
Elassoma evergladei	-	-	-	0				0	0
Elops saurus	-	-	-	0				0	0
Enneacanthus gloriosus	-	-	-	0				0	0
Erimyzon sucetta	-	-	-	0				0	0
Floridichthys carpio	-	-	-	0				0	0
Fundulus chrysotus	-	-	-	0				0	0
Fundulus grandis	-	-	-	0	Net	Net	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0				0	0
Fundulus seminolis	-	-	-	0				0	0
Fundulus similis	-	-	-	0				0	0
Fundulus similis (>6.5 cm)	-	-	-	0				0	0
Gerridae spp.	-	-	-	0				0	0
Gobiosoma bosci	-	-	-	0				0	0
Gobiosoma robustum	-	-	-	0				0	0
Heterandria formosa	-	-	-	0				0	0
Ictalurus spp.	-	-	-	0				0	0
Large Gerridae spp.	-	-	-	0				0	0
LARVAE	-	-	-	0				0	0
Lepisosteus platyrhincus	-	-	-	0				0	0
Lepomis gulosus	-	-	-	0				0	0
Lepomis macrochirus	-	-	-	0	Net	Net	Net	0	0
Lepomis marginatus	-	-	-	0				0	0
Lepomis micolophus	-	-	-	0				0	0
Lepomis punctatus	-	-	-	0				0	0
Lepomis spp.	-	-	-	0				0	0
Lophogobius cyprinoides	-	-	-	0				0	0
Lucania goodeii	-	-	-	0				0	0
Lucania parva	-	-	-	0				0	0
Menidia peninsulae	-	-	-	0				0	0
Microgobius gulosus	-	-	-	0				0	0
Micropterus salmoides	-	-	-	0				0	0
Mugil cephalus	-	-	-	0				0	0
Notropis sp.	-	-	-	0				0	0
Noturus gyrinus	-	-	-	0				0	0
Opsanus beta	-	-	-	0				0	0
Oreochromis aureus	-	-	-	0				0	0
Pogonias chromis	-	-	-	0				0	0
Scianops ocellatus	-	-	-	0				0	0
Sphyraena barracuda	-	-	-	0				0	0
Strongylura notata	-	-	-	0				0	0
Syngnathus louisianae	-	-	-	0				0	0
Syngnathus scovelli	-	-	-	0				0	0
Tilapia mariae	-	-	-	0				0	0
Trinectes maculatus	-	-	-	0				0	0
Total	345	85	270	700				0	700
Mean				233.33					233.33
Net efficiency	0.85	1	0.9	0.92	0	0	0		0.92
Efficiency adjusted total	405.88	85	300	790.88					790.88
Efficiency adjusted Mean				263.63					263.63
Efficiency adjusted SE				94.399					94.399
Efficiency Adjusted variance				26733				0	

3 #NETS
3 #DEEP
0 #FLATS

Temp:
23
Salin:
17
Depth:
-2
#Species:
58
Day:
26
Month:
3
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at JB in March 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-		23	23		61	24	85	108
Gambusia holbrooki	32		46	78		23	16	39	117
Lucania parva	54	Sampled	11	65	Sampled	-	4	4	69
Fundulus confluentus	2		-	2		3	4	7	9
Poecilia latipinna	39	Not	1	40	Not	-	-	0	40
Lucania goodeii	4		6	10		1	1	2	12
Heterandria formosa	7		5	12		1	-	1	13
Cichlasoma urophthalmus	2		-	2		-	-	0	2
Menidia peninsulae	1		1	2		-	-	0	2
Adinia xenica	-		-	0		-	-	0	0
Ameirus natalis	-		-	0		-	-	0	0
Anchoa mitchili	-		-	0		-	-	0	0
Belonesox belizanus	-		-	0		-	-	0	0
Cichlasoma bimaculatum	-		-	0		-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-		-	0		-	-	0	0
Clarias batrachus	-	Sampled	-	0	Sampled	-	-	0	0
Cynoscion nebulosus	-		-	0		-	-	0	0
Elassoma evergladei	-		-	0		-	-	0	0
Elops saurus	-		-	0		-	-	0	0
Enneacanthus gloriosus	-		-	0		-	-	0	0
Erimyzon sucetta	-		-	0		-	-	0	0
Floridichthys carpio	-		-	0		-	-	0	0
Fundulus chrysotus	-		-	0		-	-	0	0
Fundulus grandis	-	Net	-	0	Net	-	-	0	0
Fundulus grandis (>6.5 cm)	-		-	0		-	-	0	0
Fundulus seminolis	-		-	0		-	-	0	0
Fundulus similis	-		-	0		-	-	0	0
Fundulus similis (>6.5 cm)	-		-	0		-	-	0	0
Gerridae spp.	-		-	0		-	-	0	0
Gobiosoma bosci	-		-	0		-	-	0	0
Gobiosoma robustum	-		-	0		-	-	0	0
Ictalurus spp.	-		-	0		-	-	0	0
Jordanella floridae	-		-	0		-	-	0	0
Large Gerridae spp.	-		-	0		-	-	0	0
LARVAE	-		-	0		-	-	0	0
Lepisosteus platyrhincus	-		-	0		-	-	0	0
Lepomis gulosus	-		-	0		-	-	0	0
Lepomis macrochirus	-	Not	-	0	Not	-	-	0	0
Lepomis marginatus	-		-	0		-	-	0	0
Lepomis micolophus	-	Net	-	0	Net	-	-	0	0
Lepomis punctatus	-		-	0		-	-	0	0
Lepomis spp.	-		-	0		-	-	0	0
Lophogobius cyprinoides	-		-	0		-	-	0	0
Microgobius gulosus	-		-	0		-	-	0	0
Micropterus salmoides	-		-	0		-	-	0	0
Mugil cephalus	-		-	0		-	-	0	0
Notropis sp.	-		-	0		-	-	0	0
Noturus gyrinus	-		-	0		-	-	0	0
Opsanus beta	-		-	0		-	-	0	0
Oreochromis aureus	-		-	0		-	-	0	0
Pogonias chromis	-		-	0		-	-	0	0
Scianops ocellatus	-		-	0		-	-	0	0
Sphyraena barracuda	-		-	0		-	-	0	0
Strongylura notata	-		-	0		-	-	0	0
Syngnathus louisianae	-		-	0		-	-	0	0
Syngnathus scovelli	-		-	0		-	-	0	0
Tilapia mariae	-		-	0		-	-	0	0
Trinectes maculatus	-		-	0		-	-	0	0
Total	141		93	234		89	49	138	372
Mean				117				69	93
Net efficiency	0.75	0	0.8	0.78	0	0.7	0.5	0.6	0.69
Efficiency adjusted total	188		116.25	304.25		127.14	98	225.14	529.39
Efficiency adjusted Mean				152.13				112.57	132.35
Efficiency adjusted SE				35.875				14.57	19.5
Efficiency Adjusted variance				2574				424.57	

4 #NETS
2 #DEEP
2 #FLATS

Temp:
20
Salin:
21
Depth:
11
#Species:
58
Day:
23
Month:
3
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at TR in March 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	88	25	27	140	-		-	0	140
Gambusia holbrooki	-	-	-	0	61		-	61	61
Lucania goodeii	14	55	20	89	10		1	11	100
Heterandria formosa	-	1	3	4	26		1	27	31
Lucania parva	14	20	3	37	-	Sampled	7	7	44
Jordanella floridae	-	-	-	0	11		5	16	16
Cichlasoma urophthalmus (>6.5 cm)	17	2	5	24	-		-	0	24
Cyprinodon variegatus	2	-	1	3	8		3	11	14
Fundulus confluentus	-	-	-	0	9		-	9	9
Lepomis marginatus	3	-	6	9	-		-	0	9
Poecilia latipinna	2	1	2	5	1	Not	-	1	6
Enneacanthus gloriosus	-	2	-	2	-		-	0	2
Menidia peninsulae	-	2	-	2	-		-	0	2
Microgobius gulosus	-	1	-	1	-		-	0	1
Adinia xenica	-	-	-	0	-		-	0	0
Ameirus natalis	-	-	-	0	-		-	0	0
Anchoa mitchili	-	-	-	0	-		-	0	0
Belonesox belizanus	-	-	-	0	-		-	0	0
Cichlasoma bimaculatum	-	-	-	0	-		-	0	0
Clarias batrachus	-	-	-	0	-	Sampled	-	0	0
Cynoscion nebulosus	-	-	-	0	-		-	0	0
Elassoma evergladei	-	-	-	0	-		-	0	0
Elops saurus	-	-	-	0	-		-	0	0
Erimyzon sucetta	-	-	-	0	-		-	0	0
Floridichthys carpio	-	-	-	0	-		-	0	0
Fundulus chrysotus	-	-	-	0	-		-	0	0
Fundulus grandis	-	-	-	0	-	Net	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-		-	0	0
Fundulus seminolis	-	-	-	0	-		-	0	0
Fundulus similis	-	-	-	0	-		-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-		-	0	0
Gerridae spp.	-	-	-	0	-		-	0	0
Gobiosoma bosci	-	-	-	0	-		-	0	0
Gobiosoma robustum	-	-	-	0	-		-	0	0
Ictalurus spp.	-	-	-	0	-		-	0	0
Large Gerridae spp.	-	-	-	0	-		-	0	0
LARVAE	-	-	-	0	-		-	0	0
Lepisosteus platyrhincus	-	-	-	0	-		-	0	0
Lepomis gulosus	-	-	-	0	-		-	0	0
Lepomis macrochirus	-	-	-	0	-	Not	-	0	0
Lepomis micolophus	-	-	-	0	-	Net	-	0	0
Lepomis punctatus	-	-	-	0	-		-	0	0
Lepomis spp.	-	-	-	0	-		-	0	0
Lophogobius cyprinoides	-	-	-	0	-		-	0	0
Micropterus salmoides	-	-	-	0	-		-	0	0
Mugil cephalus	-	-	-	0	-		-	0	0
Notropis sp.	-	-	-	0	-		-	0	0
Noturus gyrinus	-	-	-	0	-		-	0	0
Opsanus beta	-	-	-	0	-		-	0	0
Oreochromis aureus	-	-	-	0	-		-	0	0
Pogonias chromis	-	-	-	0	-		-	0	0
Scianops ocellatus	-	-	-	0	-		-	0	0
Sphyraena barracuda	-	-	-	0	-		-	0	0
Strongylura notata	-	-	-	0	-		-	0	0
Syngnathus louisianae	-	-	-	0	-		-	0	0
Syngnathus scovelli	-	-	-	0	-		-	0	0
Tilapia mariae	-	-	-	0	-		-	0	0
Trinectes maculatus	-	-	-	0	-		-	0	0
Total	140	109	67	316	126		17	143	459
Mean				105.33				71.5	91.8
Net efficiency	0.9	1	1	0.97	0.8	0	0.9	0.85	0.92
Efficiency adjusted total	155.56	109	67	331.56	157.5		18.89	176.39	507.95
Efficiency adjusted Mean				110.52				88.19	101.59
Efficiency adjusted SE				25.576				69.305	26.579
Efficiency Adjusted variance				1962.5				9606.4	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
20
Salin:
7
Depth:
15
#Species:
58
Day:
18
Month:
3
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at BS in April 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	35	24	Sampled	59	2	11	Sampled	13	72
Cyprinodon variegatus	4	10		14	9	2		11	25
Menidia peninsulae	5	4		9	-	-		0	9
Gerridae spp.	-	2		2	1	-		1	3
Strongylura notata	-	-		0	-	1		1	1
Microgobius gulosus	3	1		4	-	-		0	4
Gambusia holbrooki	2	-		2	-	-		0	2
Poecilia latipinna	-	2	Not	2	-	-	Not	0	2
Floridichthys carpio	-	1		1	-	-		0	1
Adinia xenica	-	-		0	-	-		0	0
Ameirus natalis	-	-		0	-	-		0	0
Anchoa mitchili	-	-		0	-	-		0	0
Belonesox belizanus	-	-		0	-	-		0	0
Cichlasoma bimaculatum	-	-		0	-	-		0	0
Cichlasoma urophthalmus	-	-		0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-		0	-	-		0	0
Clarias batrachus	-	-	Sampled	0	-	-	Sampled	0	0
Cynoscion nebulosus	-	-		0	-	-		0	0
Elassoma evergladei	-	-		0	-	-		0	0
Elops saurus	-	-		0	-	-		0	0
Enneacanthus gloriosus	-	-		0	-	-		0	0
Erimyzon sucetta	-	-		0	-	-		0	0
Fundulus chrysotus	-	-		0	-	-		0	0
Fundulus confluentus	-	-		0	-	-		0	0
Fundulus grandis	-	-	Net	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-		0	-	-		0	0
Fundulus seminolis	-	-		0	-	-		0	0
Fundulus similis	-	-		0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-		0	-	-		0	0
Gobiosoma bosci	-	-		0	-	-		0	0
Gobiosoma robustum	-	-		0	-	-		0	0
Heterandria formosa	-	-		0	-	-		0	0
Ictalurus spp.	-	-		0	-	-		0	0
Jordanella floridae	-	-		0	-	-		0	0
Large Gerridae spp.	-	-		0	-	-		0	0
LARVAE	-	-		0	-	-		0	0
Lepisosteus platyrhincus	-	-		0	-	-		0	0
Lepomis gulosus	-	-		0	-	-		0	0
Lepomis macrochirus	-	-	Not	0	-	-	Not	0	0
Lepomis marginatus	-	-		0	-	-		0	0
Lepomis micolophus	-	-	Net	0	-	-	Net	0	0
Lepomis punctatus	-	-		0	-	-		0	0
Lepomis spp.	-	-		0	-	-		0	0
Lophogobius cyprinoides	-	-		0	-	-		0	0
Lucania goodeii	-	-		0	-	-		0	0
Micropterus salmoides	-	-		0	-	-		0	0
Mugil cephalus	-	-		0	-	-		0	0
Notropis sp.	-	-		0	-	-		0	0
Noturus gyrinus	-	-		0	-	-		0	0
Opsanus beta	-	-		0	-	-		0	0
Oreochromis aureus	-	-		0	-	-		0	0
Pogonias chromis	-	-		0	-	-		0	0
Scianops ocellatus	-	-		0	-	-		0	0
Sphyraena barracuda	-	-		0	-	-		0	0
Syngnathus louisianae	-	-		0	-	-		0	0
Syngnathus scovelli	-	-		0	-	-		0	0
Tilapia mariae	-	-		0	-	-		0	0
Trinectes maculatus	-	-		0	-	-		0	0
Total	49	44		93	12	14		26	119
Mean				46.5				13	29.75
Net efficiency	0.78	0.9	0	0.84	0.6	1	0	0.8	0.82
Efficiency adjusted total	62.82	48.89		111.71	20	14		34	145.71
Efficiency adjusted Mean				55.85				17	36.43
Efficiency adjusted SE				6.965				3	11.636
Efficiency Adjusted variance				97.022				18	

4 #NETS
2 #DEEP
2 #FLATS

Temp:
25
Salin:
36
Depth:
19
#Species:
58
Day:
30
Month:
4
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at HC in April 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	16	24	7	47	9	27		36	83
Fundulus confluentus	9	19	5	33	8	13		21	54
Poecilia latipinna	2	2	5	9	14	7	Not	21	30
Lucania parva	17	24	10	51	1	1	Sampled	2	53
Gambusia holbrooki	4	2	3	9	-	3		3	12
Adinia xenica	-	1	-	1	-	3		3	4
Strongylura notata	-	-	1	1	-	-		0	1
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-	Sampled	0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus chrysotus	-	-	-	0	-	-		0	0
Fundulus grandis	-	-	-	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Ictalurus spp.	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepisosteus platyrhincus	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Lucania goodeii	-	-	-	0	-	-		0	0
Menidia peninsulae	-	-	-	0	-	-		0	0
Microgobius gulosus	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-		0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Syngnathus scovelli	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	48	72	31	151	32	54		86	237
Mean				50.33				43	47.4
Net efficiency	0.8	1	1	0.93	1	1	0	1	0.96
Efficiency adjusted total	60	72	31	163	32	54		86	249
Efficiency adjusted Mean				54.33				43	49.8
Efficiency adjusted SE				12.17				11	8.015
Efficiency Adjusted variance				444.33				242	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
27
Salin:
31
Depth:
11
#Species:
58
Day:
26
Month:
4
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at JB in April 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	Sampled	71	97	168	Sampled	1	3	4	172
Gambusia holbrooki		16	10	26		3	17	20	46
Cyprinodon variegatus		4	6	10		16	2	18	28
Menidia peninsulae		-	136	136		-	-	0	136
Fundulus confluentus		21	5	26		1	1	2	28
Poecilia latipinna	Not	14	9	23	Not	-	-	0	23
Heterandria formosa		-	-	0		-	1	1	1
Belonesox belizanus		1	-	1		-	-	0	1
Cichlasoma urophthalmus		1	-	1		-	-	0	1
Jordanella floridae		1	-	1		-	-	0	1
Adinia xenica		-	-	0		-	-	0	0
Ameirus natalis		-	-	0		-	-	0	0
Anchoa mitchili		-	-	0		-	-	0	0
Cichlasoma bimaculatum		-	-	0		-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-	-	0		-	-	0	0
Clarias batrachus	Sampled	-	-	0	Sampled	-	-	0	0
Cynoscion nebulosus		-	-	0		-	-	0	0
Elassoma evergladei		-	-	0		-	-	0	0
Elops saurus		-	-	0		-	-	0	0
Enneacanthus gloriosus		-	-	0		-	-	0	0
Erimyzon sucetta		-	-	0		-	-	0	0
Floridichthys carpio		-	-	0		-	-	0	0
Fundulus chrysotus		-	-	0		-	-	0	0
Fundulus grandis	Net	-	-	0	Net	-	-	0	0
Fundulus grandis (>6.5 cm)		-	-	0		-	-	0	0
Fundulus seminolis		-	-	0		-	-	0	0
Fundulus similis		-	-	0		-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0		-	-	0	0
Gerridae spp.		-	-	0		-	-	0	0
Gobiosoma bosci		-	-	0		-	-	0	0
Gobiosoma robustum		-	-	0		-	-	0	0
Ictalurus spp.		-	-	0		-	-	0	0
Large Gerridae spp.		-	-	0		-	-	0	0
LARVAE		-	-	0		-	-	0	0
Lepisosteus platyrhincus		-	-	0		-	-	0	0
Lepomis gulosus		-	-	0		-	-	0	0
Lepomis macrochirus	Not	-	-	0	Not	-	-	0	0
Lepomis marginatus		-	-	0		-	-	0	0
Lepomis micolophus	Net	-	-	0	Net	-	-	0	0
Lepomis punctatus		-	-	0		-	-	0	0
Lepomis spp.		-	-	0		-	-	0	0
Lophogobius cyprinoides		-	-	0		-	-	0	0
Lucania goodeii		-	-	0		-	-	0	0
Microgobius gulosus		-	-	0		-	-	0	0
Micropterus salmoides		-	-	0		-	-	0	0
Mugil cephalus		-	-	0		-	-	0	0
Notropis sp.		-	-	0		-	-	0	0
Noturus gyrinus		-	-	0		-	-	0	0
Opsanus beta		-	-	0		-	-	0	0
Oreochromis aureus		-	-	0		-	-	0	0
Pogonias chromis		-	-	0		-	-	0	0
Scianops ocellatus		-	-	0		-	-	0	0
Sphyraena barracuda		-	-	0		-	-	0	0
Strongylura notata		-	-	0		-	-	0	0
Syngnathus louisianae		-	-	0		-	-	0	0
Syngnathus scovelli		-	-	0		-	-	0	0
Tilapia mariae		-	-	0		-	-	0	0
Trinectes maculatus		-	-	0		-	-	0	0
Total		129	263	392		21	24	45	437
Mean				196				22.5	109.25
Net efficiency	0	1	0.9	0.95	0	0.9	0.6	0.75	0.85
Efficiency adjusted total		129	292.22	421.22		23.33	40	63.33	484.55
Efficiency adjusted Mean				210.61				31.66	121.14
Efficiency adjusted SE				81.61				8.335	61.563
Efficiency Adjusted variance				13320				138.94	

4 #NETS
2 #DEEP
2 #FLATS

Temp:
21
Salin:
30
Depth:
8
#Species:
58
Day:
21
Month:
4
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at TR in April 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	24	4	9	37	3	22	14	39	76
Gambusia holbrooki	15	23	14	52	15	-	2	17	69
Fundulus confluentus	-	-	-	0	23	6	23	52	52
Microgobius gulosus	13	28	4	45	-	-	-	0	45
Menidia peninsulae	36	-	8	44	-	-	-	0	44
Cyprinodon variegatus	1	-	1	2	3	2	18	23	25
Heterandria formosa	16	-	9	25	-	3	-	3	28
Cichlasoma urophthalmus	3	7	12	22	-	-	-	0	22
Lucania goodeii	13	6	-	19	-	-	-	0	19
Jordanella floridae	-	-	-	0	6	2	1	9	9
Poecilia latipinna	-	-	2	2	5	-	1	6	8
Cichlasoma urophthalmus (>6.5 cm)	3	4	-	7	-	-	-	0	7
Tilapia mariae	-	-	4	4	1	-	-	1	5
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	124	72	63	259	56	35	59	150	409
Mean				86.33				50	68.17
Net efficiency	0.9	0.95	0.6	0.82	1	0.72	0.9	0.87	0.84
Efficiency adjusted total	137.78	75.79	105	318.57	56	48.61	65.56	170.17	488.74
Efficiency adjusted Mean				106.19				56.72	81.46
Efficiency adjusted SE				17.905				4.9064	13.83
Efficiency Adjusted variance				961.75				72.218	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
25
Depth:
12
#Species:
58
Day:
16
Month:
4
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at BS in June 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus		25	13	38	37	15	39	91	129
Lucania parva	Sampled	32	20	52	1	7	13	21	73
Microgobius gulosus		11	10	21	4	3	2	9	30
Poecilia latipinna	Not	21	20	41	-	-	-	0	41
Gerridae spp.		2	1	3	2	2	5	9	12
Gambusia holbrooki		-	4	4	-	1	-	1	5
Adinia xenica		1	-	1	-	-	-	0	1
Fundulus confluentus		1	-	1	-	-	-	0	1
Opsanus beta		-	1	1	-	-	-	0	1
Ameirus natalis		-	-	0	-	-	-	0	0
Anchoa mitchili		-	-	0	-	-	-	0	0
Belonesox belizanus		-	-	0	-	-	-	0	0
Cichlasoma bimaculatum		-	-	0	-	-	-	0	0
Cichlasoma urophthalmus		-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-	-	0	-	-	-	0	0
Clarias batrachus	Sampled	-	-	0	-	-	-	0	0
Cynoscion nebulosus		-	-	0	-	-	-	0	0
Elassoma evergladei		-	-	0	-	-	-	0	0
Elops saurus		-	-	0	-	-	-	0	0
Enneacanthus gloriosus		-	-	0	-	-	-	0	0
Erimyzon sucetta		-	-	0	-	-	-	0	0
Floridichthys carpio		-	-	0	-	-	-	0	0
Fundulus chrysotus		-	-	0	-	-	-	0	0
Fundulus grandis	Net	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)		-	-	0	-	-	-	0	0
Fundulus seminolis		-	-	0	-	-	-	0	0
Fundulus similis		-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0	-	-	-	0	0
Gobiosoma bosci		-	-	0	-	-	-	0	0
Gobiosoma robustum		-	-	0	-	-	-	0	0
Heterandria formosa		-	-	0	-	-	-	0	0
Ictalurus spp.		-	-	0	-	-	-	0	0
Jordanella floridae		-	-	0	-	-	-	0	0
Large Gerridae spp.		-	-	0	-	-	-	0	0
LARVAE		-	-	0	-	-	-	0	0
Lepisosteus platyrhincus		-	-	0	-	-	-	0	0
Lepomis gulosus		-	-	0	-	-	-	0	0
Lepomis macrochirus	Not	-	-	0	-	-	-	0	0
Lepomis marginatus		-	-	0	-	-	-	0	0
Lepomis micolophus	Net	-	-	0	-	-	-	0	0
Lepomis punctatus		-	-	0	-	-	-	0	0
Lepomis spp.		-	-	0	-	-	-	0	0
Lophogobius cyprinoides		-	-	0	-	-	-	0	0
Lucania goodeii		-	-	0	-	-	-	0	0
Menidia peninsulae		-	-	0	-	-	-	0	0
Micropterus salmoides		-	-	0	-	-	-	0	0
Mugil cephalus		-	-	0	-	-	-	0	0
Notropis sp.		-	-	0	-	-	-	0	0
Noturus gyrinus		-	-	0	-	-	-	0	0
Oreochromis aureus		-	-	0	-	-	-	0	0
Pogonias chromis		-	-	0	-	-	-	0	0
Scianops ocellatus		-	-	0	-	-	-	0	0
Sphyraena barracuda		-	-	0	-	-	-	0	0
Strongylura notata		-	-	0	-	-	-	0	0
Syngnathus louisianae		-	-	0	-	-	-	0	0
Syngnathus scovelli		-	-	0	-	-	-	0	0
Tilapia mariae		-	-	0	-	-	-	0	0
Trinectes maculatus		-	-	0	-	-	-	0	0
Total		93	69	162	44	28	59	131	293
Mean				81				43.67	58.6
Net efficiency	0	0.8	0.87	0.84	1	0.93	1	0.98	0.92
Efficiency adjusted total		116.25	79.31	195.56	44	30.11	59	133.11	328.67
Efficiency adjusted Mean				97.78				44.37	65.73
Efficiency adjusted SE				18.47				8.3419	15.038
Efficiency Adjusted variance				682.28				208.76	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
28
Salin:
29
Depth:
15
#Species:
58
Day:
29
Month:
7
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at HC in June 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	7	4	13	24	11	22	44	77	101
Lucania parva	9	12	2	23	-	4	3	7	30
Poecilia latipinna	6	1	-	7	-	3	2	5	12
Fundulus confluentus	-	2	-	2	-	-	4	4	6
Microgobius gulosus	8	1	-	9	1	-	-	1	10
Gerridae spp.	-	-	-	0	-	1	-	1	1
Menidia peninsulae	-	-	-	0	-	1	-	1	1
Cichlasoma urophthalmus	1	-	1	2	-	-	-	0	2
Gambusia holbrooki	1	-	-	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	32	20	16	68	12	31	53	96	164
Mean				22.67				32	27.33
Net efficiency	1	0.8	1	0.93	1	0.8	1	0.93	0.93
Efficiency adjusted total	32	25	16	73	12	38.75	53	103.75	176.75
Efficiency adjusted Mean				24.33				34.58	29.46
Efficiency adjusted SE				4.6308				12.018	6.1989
Efficiency Adjusted variance				64.333				433.27	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
27	
Salin:	
4	
Depth:	
19	
#Species:	
58	
Day:	
15	
Month:	
7	
Year:	
1999	

Number of fish collected by species, summary statistics and physical parameters collected at JB in June 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	18	24	18	60	16	3	Sampled	19	79
Cyprinodon variegatus	3	9	4	16	5	7		12	28
Fundulus confluentus	-	1	-	1	3	-		3	4
Gerridae spp.	-	-	1	1	-	1		1	2
Fundulus grandis	-	-	-	0	-	1	Net	1	1
Menidia peninsulae	-	-	-	0	-	1		1	1
Poecilia latipinna	-	-	-	0	-	1	Not	1	1
Cichlasoma urophthalmus (>6.5 cm)	-	4	-	4	-	-		0	4
Trinectes maculatus	1	-	-	1	-	-		0	1
Adinia xenica	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-	Sampled	0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus chrysotus	-	-	-	0	-	-		0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gambusia holbrooki	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Ictalurus spp.	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepisosteus platyrhincus	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Lucania goodeii	-	-	-	0	-	-		0	0
Microgobius gulosus	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-		0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Syngnathus scovelli	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Total	22	38	23	83	24	14		38	121
Mean				27.67				19	24.2
Net efficiency	0.78	0.8	1	0.86	0.4	1	0	0.7	0.8
Efficiency adjusted total	28.21	47.5	23	98.71	60	14		74	172.71
Efficiency adjusted Mean				32.9				37	34.54
Efficiency adjusted SE				7.4517				23	8.4003
Efficiency Adjusted variance				166.58				1058	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
33
Salin:
0
Depth:
18
#Species:
58
Day:
22
Month:
7
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at TR in June 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	57	14	14	85	47	7	41	95	180
Lucania parva	43	32	42	117	2	6	5	13	130
Microgobius gulosus	29	27	11	67	9	2	10	21	88
Lophogobius cyprinoides	8	17	54	79	-	-	-	0	79
Menidia peninsulae	1	-	12	13	39	-	-	39	52
Poecilia latipinna	6	22	5	33	-	2	-	2	35
Fundulus confluentus	-	-	-	0	-	4	1	5	5
LARVAE	6	-	-	6	-	-	-	0	6
Gambusia holbrooki	3	-	-	3	-	-	-	0	3
Cichlasoma urophthalmus	-	-	-	0	-	2	-	2	2
Cichlasoma urophthalmus (>6.5 cm)	-	-	1	1	-	-	1	1	2
Belonesox belizanus	-	-	-	0	-	1	-	1	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	153	112	139	404	97	24	58	179	583
Mean				134.67				59.67	97.17
Net efficiency	0.92	0.95	0.5	0.79	1	0.5	0.9	0.8	0.79
Efficiency adjusted total	166.3	117.89	278	562.19	97	48	64.44	209.44	771.63
Efficiency adjusted Mean				187.4				69.81	128.6
Efficiency adjusted SE				47.408				14.398	34.384
Efficiency Adjusted variance				6742.6				621.9	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
29	
Salin:	
1	
Depth:	
32	
#Species:	
58	
Day:	
7	
Month:	
7	
Year:	
1999	

Number of fish collected by species, summary statistics and physical parameters collected at BS in September 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Microgobius gulosus	1	-	3	4	14	6	4	24	28
Cyprinodon variegatus	-	3	1	4	7	4	11	22	26
Lucania parva	5	19	4	28	6	5	5	16	44
Gerridae spp.	-	-	-	0	3	-	4	7	7
Strongylura notata	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	6	22	9	37	30	15	24	69	106
Mean				12.33				23	17.67
Net efficiency	0.78	0.87	0.6	0.75	0.82	0.6	0.77	0.73	0.74
Efficiency adjusted total	7.69	25.29	15	47.98	36.59	25	31.17	92.76	140.74
Efficiency adjusted Mean				15.99				30.92	23.46
Efficiency adjusted SE				5.1049				3.3481	4.3121
Efficiency Adjusted variance				78.18				33.629	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
7
Depth:
37
#Species:
58
Day:
7
Month:
10
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at HC in September 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus		14	8	22	7	5	6	18	40
Lucania parva	Sampled	2	1	3	-	1	2	3	6
Cichlasoma urophthalmus		2	-	2	-	-	-	0	2
Fundulus confluentus		2	-	2	-	-	-	0	2
Adinia xenica		-	-	0	-	-	-	0	0
Ameirus natalis		-	-	0	-	-	-	0	0
Anchoa mitchili		-	-	0	-	-	-	0	0
Belonesox belizanus		-	-	0	-	-	-	0	0
Cichlasoma bimaculatum		-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-	-	0	-	-	-	0	0
Clarias batrachus	Sampled	-	-	0	-	-	-	0	0
Cynoscion nebulosus		-	-	0	-	-	-	0	0
Elassoma evergladei		-	-	0	-	-	-	0	0
Elops saurus		-	-	0	-	-	-	0	0
Enneacanthus gloriosus		-	-	0	-	-	-	0	0
Erimyzon sucetta		-	-	0	-	-	-	0	0
Floridichthys carpio		-	-	0	-	-	-	0	0
Fundulus chrysotus		-	-	0	-	-	-	0	0
Fundulus grandis	Net	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)		-	-	0	-	-	-	0	0
Fundulus seminolis		-	-	0	-	-	-	0	0
Fundulus similis		-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0	-	-	-	0	0
Gambusia holbrooki		-	-	0	-	-	-	0	0
Gerridae spp.		-	-	0	-	-	-	0	0
Gobiosoma bosci		-	-	0	-	-	-	0	0
Gobiosoma robustum		-	-	0	-	-	-	0	0
Heterandria formosa		-	-	0	-	-	-	0	0
Ictalurus spp.		-	-	0	-	-	-	0	0
Jordanella floridae		-	-	0	-	-	-	0	0
Large Gerridae spp.		-	-	0	-	-	-	0	0
LARVAE		-	-	0	-	-	-	0	0
Lepisosteus platyrhincus		-	-	0	-	-	-	0	0
Lepomis gulosus		-	-	0	-	-	-	0	0
Lepomis macrochirus	Not	-	-	0	-	-	-	0	0
Lepomis marginatus		-	-	0	-	-	-	0	0
Lepomis micolophus	Net	-	-	0	-	-	-	0	0
Lepomis punctatus		-	-	0	-	-	-	0	0
Lepomis spp.		-	-	0	-	-	-	0	0
Lophogobius cyprinoides		-	-	0	-	-	-	0	0
Lucania goodeii		-	-	0	-	-	-	0	0
Menidia peninsulae		-	-	0	-	-	-	0	0
Microgobius gulosus		-	-	0	-	-	-	0	0
Micropterus salmoides		-	-	0	-	-	-	0	0
Mugil cephalus		-	-	0	-	-	-	0	0
Notropis sp.		-	-	0	-	-	-	0	0
Noturus gyrinus		-	-	0	-	-	-	0	0
Opsanus beta		-	-	0	-	-	-	0	0
Oreochromis aureus		-	-	0	-	-	-	0	0
Poecilia latipinna	Not	-	-	0	-	-	-	0	0
Pogonias chromis		-	-	0	-	-	-	0	0
Scianops ocellatus		-	-	0	-	-	-	0	0
Sphyraena barracuda		-	-	0	-	-	-	0	0
Strongylura notata		-	-	0	-	-	-	0	0
Syngnathus louisianae		-	-	0	-	-	-	0	0
Syngnathus scovelli		-	-	0	-	-	-	0	0
Tilapia mariae		-	-	0	-	-	-	0	0
Trinectes maculatus		-	-	0	-	-	-	0	0
Total		20	9	29	7	6	8	21	50
Mean				14.5				7	10
Net efficiency	0	0.92	0.98	0.95	1	0.95	0.4	0.78	0.85
Efficiency adjusted total		21.74	9.18	30.92	7	6.32	20	33.32	64.24
Efficiency adjusted Mean				15.46				11.11	12.85
Efficiency adjusted SE				6.28				4.451	3.3203
Efficiency Adjusted variance				78.877				59.434	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
27
Salin:
0
Depth:
34
#Species:
58
Day:
30
Month:
9
Year:
1999

Number of fish collected by species, summary statistics and physical parameters collected at JB in September 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	2	-	2	4	31	7		38	42
Lucania parva	36	16	28	80	13	4	Sampled	17	97
Gerridae spp.	-	-	-	0	-	3		3	3
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	1	-		1	1
Cichlasoma urophthalmus	1	3	-	4	-	-		0	4
Fundulus confluentus	-	1	-	1	-	-		0	1
Adinia xenica	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-	Sampled	0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus chrysotus	-	-	-	0	-	-		0	0
Fundulus grandis	-	-	-	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gambusia holbrooki	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Ictalurus spp.	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepisosteus platyrhincus	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Lucania goodeii	-	-	-	0	-	-		0	0
Menidia peninsulae	-	-	-	0	-	-		0	0
Microgobius gulosus	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-		0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Poecilia latipinna	-	-	-	0	-	-	Not	0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Syngnathus scovelli	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	39	20	30	89	45	14		59	148
Mean				29.67				29.5	29.6
Net efficiency	0.78	0.8	0.95	0.84	0.72	0.93	0	0.83	0.84
Efficiency adjusted total	50	25	31.58	106.58	62.5	15.05		77.55	184.13
Efficiency adjusted Mean				35.53				38.77	36.83
Efficiency adjusted SE				7.4818				23.725	8.5857
Efficiency Adjusted variance				167.93				1125.8	

5	#NETS
3	#DEEP
2	#FLATS
Temp:	
28	
Salin:	
3	
Depth:	
48	
#Species:	
58	
Day:	
18	
Month:	
9	
Year:	
1999	

Number of fish collected by species, summary statistics and physical parameters collected at TR in September 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	13	36	21	70	2	-	4	6	76
Microgobius gulosus	15	12	2	29	1	-	4	5	34
Cichlasoma urophthalmus	6	1	6	13	5	8	1	14	27
Cyprinodon variegatus	10	-	3	13	-	1	2	3	16
Lophogobius cyprinoides	3	4	1	8	-	-	-	0	8
Poecilia latipinna	-	2	-	2	4	-	-	4	6
Strongylura notata	-	-	-	0	2	-	-	2	2
Fundulus confluentus	-	-	-	0	-	1	-	1	1
Gambusia holbrooki	-	-	-	0	-	1	-	1	1
Cichlasoma urophthalmus (>6.5 cm)	1	-	-	1	-	-	-	0	1
Menidia peninsulae	-	-	1	1	-	-	-	0	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	48	55	34	137	14	11	11	36	173
Mean				45.67				12	28.83
Net efficiency	0.92	0.95	0.82	0.9	0.95	0.7	0.9	0.85	0.87
Efficiency adjusted total	52.17	57.89	41.46	151.52	14.74	15.71	12.22	42.67	194.19
Efficiency adjusted Mean				50.51				14.22	32.37
Efficiency adjusted SE				4.8153				1.0401	8.407
Efficiency Adjusted variance				69.561				3.2453	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
28
Salin:
2
Depth:
41
#Species:
58
Day:
9
Month:
9
Year:
1999

Organization of Tables in Appendix C.

Appendix C. provides biomass data for each fish collection. This appendix is organized chronologically by month with the sites presented in alphabetical order (e.g. June 1995 was the first sample collected so the first table summarizes the June 1995 collection at BS, followed by summary tables for the June 1995 collections at HC, JB and TR). Each table lists biomass of fish collected on an individual sample date. Species are listed in order of decreasing abundance. The columns headed 'NET 4', 'NET 5' and 'NET 6' summarize the data from individual drop traps from creek micro-habitat. The 'DEEP' column sums these three nets. The columns headed 'NET 10', 'NET 11', and 'NET 12' summarize the data from individual drop traps from flats micro-habitat. The 'FLATS' column sums these three nets. The 'TOTAL' column sums all nets. In cases where nets were not sampled due to technical problems, the column for that net indicates 'NET NOT SAMPLED.' Similarly, if the nets were not sampled because they were dry, the column indicates 'NET DRY.' The number of nets sampled are summarized in the upper right corner. Physicochemical parameters and the date of collection are also located in the upper right below the net summary. 'Temp' indicates the temperature when traps were triggered. 'Salin' indicates the average salinity for the day from data recorders. 'Depth' indicates the mean daily depth on the flats as recorded by the Telog data recorders.

The last 8 rows provide summary statistics. 'Total' and 'Mean' are self explanatory. 'Net Efficiency' is the collection efficiency as explained in Appendix A. 'Efficiency adjusted total' is calculated by multiplying the net efficiency by the total. The mean, standard error and variance based on the efficiency adjustment are provided in the last 3 rows.

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in June 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Large Gerridae spp.	-	-	-	0	20.59	-	-	20.59	20.59
Floridichthys carpio	1.54	8.16	1.53	11.24	0.54	3.59	2.18	6.31	17.55
Microgobius gulosus	1.12	1.05	5.6	7.77	2.5	1.24	3.4	7.13	14.9
Lucania parva	1.64	4.89	3.29	9.82	2.35	1.41	1.27	5.02	14.84
Gerridae spp.	20.82	4.68	1.27	26.77	-	0.64	-	0.64	27.41
Cyprinodon variegatus	-	5.75	1.38	7.13	0.74	2.55	1.32	4.61	11.75
Gambusia holbrooki	-	0.3	0.59	0.89	-	-	0.42	0.42	1.31
Opsanus beta	-	-	-	0	-	0.53	-	0.53	0.53
Syngnathus louisianae	0.38	-	-	0.38	-	-	-	0	0.38
Strongylura notata	0.02	0.26	-	0.28	-	-	-	0	0.28
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	25.52	25.09	13.66	64.27	26.72	9.96	8.59	45.26	109.54
Mean				21.42				15.09	18.26
Net efficiency	0.6	1	1	0.87	1	1	1	1	0.93
Efficiency adjusted total	42.53	25.09	13.66	81.28	26.72	9.96	8.59	45.27	126.55
Efficiency adjusted Mean				27.09				15.09	21.09
Efficiency adjusted SE				8.394				5.8284	5.3
Efficiency Adjusted variance				211.38				101.91	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
7
Depth:
18
#Species:
56
Day:
23
Month:
6
Year:
1995

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in June 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	10.07	9.5	12.88	32.45	16.96	30.78	9.44	57.18	89.63
Cichlasoma urophthalmus	9.21	4.21	6.78	20.2	10.56	-	-	10.56	30.76
Fundulus confluentus	-	-	-	0	0.22	-	2.28	2.5	2.5
Lucania parva	0.82	0.64	0.96	2.42	0.88	0.3	0.47	1.65	4.07
Poecilia latipinna	-	3.34	-	3.34	-	-	-	0	3.34
Gambusia holbrooki	0.87	0.79	0.03	1.69	-	0.24	-	0.24	1.93
Lucania goodeii	0.86	0.28	-	1.14	0.22	-	-	0.22	1.36
Microgobius gulosus	-	-	-	0	0.31	-	-	0.31	0.31
Fundulus chrysotus	0.47	-	-	0.47	-	-	-	0	0.47
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	22.3	18.76	20.65	61.71	29.15	31.32	12.19	72.66	134.38
Mean				20.57				24.22	22.4
Net efficiency	0.875	0.857	1	0.91	1	1	0.8	0.93	0.92
Efficiency adjusted total	25.49	21.89	20.65	68.03	29.15	31.32	15.24	75.71	143.74
Efficiency adjusted Mean				22.68				25.24	23.96
Efficiency adjusted SE				1.4515				5.0374	2.4133
Efficiency Adjusted variance				6.3205				76.127	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
29
Salin:
0
Depth:
21
#Species:
56
Day:
20
Month:
6
Year:
1995

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in June 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	7.85	0.68	8.52	6.05	29.31	11.38	46.74	55.26
Fundulus confluentus	0.01	-	-	0.01	16.09	4.23	1.29	21.61	21.62
Poecilia latipinna	3.33	10.95	0.98	15.26	0.89	2.34	4.89	8.12	23.39
Lucania parva	4.54	5.84	3.54	13.91	1.41	1	2.22	4.63	18.55
Menidia peninsulae	1.27	-	1.9	3.17	-	1.98	1.21	3.19	6.36
Cichlasoma urophthalmus	5.06	4.26	7.32	16.64	-	0.46	-	0.46	17.1
Microgobius gulosus	1.46	0.34	0.47	2.27	0.33	0.39	0.74	1.46	3.73
Cichlasoma urophthalmus (>6.5 cm)	11.32	-	-	11.32	-	-	-	0	11.32
Lepomis punctatus	-	6.62	-	6.62	-	-	-	0	6.62
Gambusia holbrooki	0.24	0.56	-	0.8	0.01	-	0.01	0.02	0.82
Lucania goodeii	-	0.19	0.25	0.44	-	-	-	0	0.44
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	27.23	36.61	15.14	78.97	24.78	39.7	21.74	86.23	165.2
Mean				26.33				28.74	27.53
Net efficiency	1	1	0.84	0.95	0.92	0.95	1	0.96	0.95
Efficiency adjusted total	27.23	36.61	18.02	81.86	26.93	41.79	21.74	90.46	172.32
Efficiency adjusted Mean				27.29				30.15	28.72
Efficiency adjusted SE				5.3665				6.0081	3.6593
Efficiency Adjusted variance				86.399				108.29	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
29	
Salin:	
2	
Depth:	
25	
#Species:	
56	
Day:	
15	
Month:	
6	
Year:	
1995	

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in June 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	-	19.75	58.96	78.71	50.33	-	-	50.33	129.04
Cichlasoma urophthalmus	1.72	0.85	9.95	12.52	26.8	6.5	8.18	41.48	53.99
Lophogobius cyprinoides	24.99	16.34	2.74	44.07	3.34	-	-	3.34	47.41
Cyprinodon variegatus	12.16	3.15	24.36	39.67	-	1.85	-	1.85	41.52
Microgobius gulosus	10.55	7.25	12.22	30.02	0.35	-	-	0.35	30.37
Lucania parva	9.41	4.94	10.09	24.45	-	1.69	0.28	1.97	26.42
Tilapia mariae	3.01	0.82	0.66	4.48	-	4.47	-	4.47	8.95
Menidia peninsulae	3	2.14	2.53	7.66	-	-	-	0	7.66
Poecilia latipinna	0.46	0.24	0.97	1.67	-	2.11	-	2.11	3.78
Fundulus confluentus	-	-	-	0	-	2.81	-	2.81	2.81
Belonesox belizanus	-	-	-	0	-	1.25	-	1.25	1.25
Lucania goodeii	0.61	-	-	0.61	-	-	-	0	0.61
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	65.91	55.47	122.48	243.86	80.82	20.67	8.46	109.95	353.81
Mean				81.29				36.65	58.97
Net efficiency	0.82	0.8	0.88	0.83	0.88	0.9	0.93	0.9	0.87
Efficiency adjusted total	80.38	69.34	139.18	288.9	91.84	22.97	9.1	123.91	412.81
Efficiency adjusted Mean				96.3				41.3	68.8
Efficiency adjusted SE				21.676				25.584	19.393
Efficiency Adjusted variance				1409.5				1963.6	

6 #NETS
3 #DEEP
3 #FLATS

Temp: 29
Salin: 2
Depth: 25
#Species: 56
Day: 13
Month: 6
Year: 1995

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in November 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Microgobius gulosus	1.31	1.94	3.36	6.61	1.87	0.67	1.2	3.75	10.36
Floridichthys carpio	-	-	1.04	1.04	1.91	-	0.26	2.17	3.21
Lucania parva	1.73	2.1	1.21	5.04	0.35	0.34	0.25	0.94	5.98
Cyprinodon variegatus	0.21	0.6	0.85	1.66	1.28	-	0.29	1.57	3.23
Gambusia holbrooki	0.1	-	0.33	0.43	-	-	0.26	0.26	0.69
Poecilia latipinna	0.3	0.59	0.26	1.15	-	-	-	0	1.15
Menidia peninsulae	0.81	-	-	0.81	-	-	-	0	0.81
Belonesox belizanus	-	-	0.55	0.55	-	-	-	0	0.55
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	4.46	5.23	7.6	17.3	5.41	1.01	2.26	8.69	25.98
Mean				5.76				2.89	4.33
Net efficiency	0.79	0.83	0.91	0.84	0.79	0.92	0.92	0.88	0.86
Efficiency adjusted total	5.65	6.3	8.35	20.3	6.85	1.1	2.46	10.41	30.71
Efficiency adjusted Mean				6.77				3.47	5.12
Efficiency adjusted SE				0.8136				1.735	1.1304
Efficiency Adjusted variance				1.9859				9.0307	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
20
Salin:
11
Depth:
25
#Species:
58
Day:
27
Month:
11
Year:
1995

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in November 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	88.31	28.01	34.88	151.2	13.63	3.76	3.05	20.44	171.64
Poecilia latipinna	61.26	45.57	15.44	122.27	-	10.7	-	10.7	132.97
Cyprinodon variegatus	2.3	-	-	2.3	1.66	9.98	1.13	12.78	15.08
Fundulus confluentus	-	-	-	0	5.09	1.19	-	6.27	6.27
Belonesox belizanus	0.53	-	0.42	0.95	-	2.06	0.15	2.21	3.16
Cichlasoma urophthalmus (>6.5 cm)	13.95	-	-	13.95	-	-	-	0	13.95
Lepomis punctatus	11.95	-	-	11.95	-	-	-	0	11.95
Gambusia holbrooki	1	0.46	-	1.46	0.31	0.59	-	0.9	2.36
Lucania parva	-	-	-	0	0.46	-	-	0.46	0.46
Tilapia mariae	-	0.73	-	0.73	-	-	-	0	0.73
Enneacanthus gloriosus	-	-	0.34	0.34	-	-	-	0	0.34
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	0	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	179.3	74.77	51.08	305.15	21.14	28.28	4.34	53.76	358.92
Mean				101.72				17.92	59.82
Net efficiency	0.6	0.95	0.9	0.82	1	1	0.86	0.95	0.89
Efficiency adjusted total	298.83	78.71	56.76	434.3	21.14	28.28	5.05	54.47	488.77
Efficiency adjusted Mean				144.77				18.16	81.46
Efficiency adjusted SE				77.292				6.8698	44.786
Efficiency Adjusted variance				17922				141.58	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
0
Depth:
14
#Species:
58
Day:
4
Month:
12
Year:
1994

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in November 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	117.38	414.87	165.69	697.94	-	-	-	0	697.94
Cichlasoma urophthalmus	22.13	72.6	24.83	119.56	16.47	1.54	15.3	33.31	152.87
Poecilia latipinna	-	-	13.8	13.8	7.57	1.57	-	9.14	22.94
Lucania parva	1.38	0.22	0.39	1.99	0.67	3.05	1.61	5.33	7.31
Erimyzon sucetta	-	13.73	-	13.73	-	-	-	0	13.73
Ictalurus spp.	-	13.19	-	13.19	-	-	-	0	13.19
Lepomis punctatus	-	8.48	-	8.48	-	-	-	0	8.48
Cyprinodon variegatus	-	-	-	0	-	1.09	-	1.09	1.09
Microgobius gulosus	-	-	-	0	-	1.04	-	1.04	1.04
Belonesox belizanus	0.92	4.94	-	5.86	-	-	-	0	5.86
Tilapia mariae	-	4.75	0.09	4.84	-	-	-	0	4.84
Lepomis marginatus	-	-	4.15	4.15	-	-	-	0	4.15
Fundulus confluentus	-	-	-	0	0.41	-	-	0.41	0.41
Lucania goodeii	0.25	0.08	0.79	1.12	-	-	0.09	0.09	1.21
Menidia peninsulae	0.32	-	-	0.32	-	-	-	0	0.32
Lepomis spp.	-	-	0.04	0.04	-	-	-	0	0.04
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	142.38	532.86	209.77	885.01	25.11	8.29	17	50.4	935.41
Mean				295				16.8	155.9
Net efficiency	0.7	0.8	0.8	0.77	0.8	0.9	0.8	0.83	0.8
Efficiency adjusted total	203.4	666.07	262.21	1131.7	31.39	9.21	21.25	61.85	1193.5
Efficiency adjusted Mean				377.23				20.62	198.92
Efficiency adjusted SE				145.42				6.4106	102.94
Efficiency Adjusted variance				63438				123.29	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
0
Depth:
21
#Species:
58
Day:
30
Month:
11
Year:
1995

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in November 1995

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	-	8.57	9.85	18.42	-	11.65	-	11.65	30.07
Cichlasoma urophthalmus (>6.5 cm)	-	-	30.37	30.37	-	-	-	0	30.37
Lophogobius cyprinoides	8.04	3.78	12.2	24.01	1.61	-	-	1.61	25.62
Lucania parva	11.14	4.52	1.38	17.04	-	1.92	2.04	3.96	21
Lucania goodeii	5.99	0.95	1.96	8.91	1.14	0.49	0.58	2.21	11.12
Cyprinodon variegatus	4.2	1.15	0.39	5.73	0.08	1.45	2.41	3.94	9.67
Microgobius gulosus	0.9	5.04	-	5.94	-	-	1.76	1.76	7.7
Tilapia mariae	2.03	1.19	0.43	3.65	0.32	1.77	-	2.09	5.74
Poecilia latipinna	1.68	-	0.63	2.31	-	1.3	-	1.3	3.61
Fundulus seminolis	-	-	-	0	-	-	0.38	0.38	0.38
Elassoma evergladei	0.47	-	-	0.47	-	-	-	0	0.47
Notropis sp.	-	-	-	0	-	-	0.36	0.36	0.36
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	34.45	25.2	57.2	116.85	3.15	18.58	7.53	29.27	146.12
Mean				38.95				9.75	24.35
Net efficiency	1	0.83	0.88	0.9	0.88	0.9	0.8	0.86	0.88
Efficiency adjusted total	34.45	30.36	65	129.81	3.58	20.64	9.41	33.63	163.44
Efficiency adjusted Mean				43.27				11.21	27.24
Efficiency adjusted SE				10.929				5.0064	8.9607
Efficiency Adjusted variance				358.33				75.191	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
21
Salin:
0
Depth:
28
#Species:
58
Day:
20
Month:
11
Year:
1995

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in January 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus grandis (>6.5 cm)	48.61	-	-	48.61	-	-	-	0	48.61
Floridichthys carpio	-	1.11	-	1.11	1.23	0.87	0.21	2.32	3.43
Cyprinodon variegatus	0.28	1.87	0.98	3.13	0.18	0.57	0.58	1.33	4.46
Microgobius gulosus	1.35	0.67	2.16	4.19	0.19	0.49	0.3	0.98	5.16
Fundulus grandis	5.89	-	-	5.89	-	-	-	0	5.89
Lucania parva	0.17	0.14	0.61	0.92	-	0.15	0.28	0.43	1.35
Gambusia holbrooki	-	-	0.45	0.45	-	-	0.19	0.19	0.64
Trinectes maculatus	-	-	-	0	-	0.04	0.1	0.14	0.14
Poecilia latipinna	0.13	-	-	0.13	-	-	-	0	0.13
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Total	56.43	3.79	4.2	64.43	1.6	2.12	1.66	5.38	69.81
Mean				21.47				1.79	11.63
Net efficiency	0.4	0.8	1	0.73	0.79	0.8	0.6	0.73	0.73
Efficiency adjusted total	141.07	4.74	4.2	150.01	2.03	2.65	2.77	7.45	157.46
Efficiency adjusted Mean				50				2.48	26.24
Efficiency adjusted SE				45.534				0.2293	22.969
Efficiency Adjusted variance				6219.9				0.1578	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
24	
Salin:	
17	
Depth:	
13	
#Species:	
56	
Day:	
1	
Month:	
2	
Year:	
1996	

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in January 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Poecilia latipinna	66.02	3.78	30.31	100.11	-	-	-	0	100.11
Fundulus confluentus	4.46	5.45	25.05	34.96	1.72	1.59	0.73	4.04	39
Cyprinodon variegatus	14.09	1.65	27.57	43.32	0.84	-	0.4	1.24	44.56
Fundulus grandis	5.97	-	36.5	42.47	-	-	-	0	42.47
Fundulus grandis (>6.5 cm)	13.02	-	17.41	30.43	-	-	-	0	30.43
Lucania parva	0.18	0.74	1.15	2.07	0.78	-	0.3	1.08	3.15
Adinia xenica	-	-	3.1	3.1	-	-	-	0	3.1
Jordanella floridae	-	-	-	0	-	0.42	-	0.42	0.42
Cichlasoma urophthalmus	2.49	-	-	2.49	-	-	-	0	2.49
Lepomis punctatus	1.34	-	-	1.34	-	-	-	0	1.34
Gambusia holbrooki	0.95	0.21	-	1.16	-	-	-	0	1.16
Lucania goodeii	0.76	-	0.22	0.98	-	-	-	0	0.98
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	109.27	11.84	141.31	262.42	3.34	2.01	1.43	6.78	269.2
Mean				87.47				2.26	44.87
Net efficiency	0.9	0.9	1	0.93	0.9	0.9	0.6	0.8	0.87
Efficiency adjusted total	121.41	13.16	141.31	275.88	3.71	2.23	2.38	8.32	284.2
Efficiency adjusted Mean				91.96				2.77	47.37
Efficiency adjusted SE				39.817				0.4703	26.736
Efficiency Adjusted variance				4756.1				0.6637	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
0
Depth:
13
#Species:
56
Day:
22
Month:
1
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in January 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	171.34		-	171.34	-	-	-	0	171.34
Lucania parva	0.07	Sampled	1.26	1.33	0.78	1.35	4.67	6.8	8.13
Cyprinodon variegatus	-		-	0	-	0.39	4.54	4.92	4.92
Fundulus confluentus	-		-	0	0.54	-	2.13	2.67	2.67
Lepomis marginatus	-		11.61	11.61	-	-	-	0	11.61
Lepomis punctatus	2.06		5.69	7.74	-	-	-	0	7.74
Lucania goodeii	3.5		0.29	3.79	-	0.26	0.34	0.6	4.39
Poecilia latipinna	-	Not	-	0	-	-	0.29	0.29	0.29
Microgobius gulosus	0.33		-	0.33	-	-	-	0	0.33
Notropis sp.	-		0.11	0.11	-	-	-	0	0.11
Adinia xenica	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Anchoa mitchili	-		-	0	-	-	-	0	0
Belonesox belizanus	-		-	0	-	-	-	0	0
Cichlasoma bimaculatum	-		-	0	-	-	-	0	0
Cichlasoma urophthalmus	-		-	0	-	-	-	0	0
Clarias batrachus	-		-	0	-	-	-	0	0
Cynoscion nebulosus	-		-	0	-	-	-	0	0
Elassoma evergladei	-		-	0	-	-	-	0	0
Elops saurus	-		-	0	-	-	-	0	0
Enneacanthus glriosus	-		-	0	-	-	-	0	0
Erimyzon sucetta	-		-	0	-	-	-	0	0
Floridichthys carpio	-		-	0	-	-	-	0	0
Fundulus chrysotus	-		-	0	-	-	-	0	0
Fundulus grandis	-	Net	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-		-	0	-	-	-	0	0
Fundulus seminolis	-		-	0	-	-	-	0	0
Fundulus similis	-		-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-		-	0	-	-	-	0	0
Gambusia holbrooki	-		-	0	-	-	-	0	0
Gerridae spp.	-		-	0	-	-	-	0	0
Gobiosoma bosci	-		-	0	-	-	-	0	0
Gobiosoma robustum	-		-	0	-	-	-	0	0
Heterandria formosa	-		-	0	-	-	-	0	0
Jordanella floridae	-		-	0	-	-	-	0	0
Large Gerridae spp.	-		-	0	-	-	-	0	0
LARVAE	-		-	0	-	-	-	0	0
Lepomis gulosus	-		-	0	-	-	-	0	0
Lepomis macrochirus	-	Not	-	0	-	-	-	0	0
Lepomis micolophus	-	Net	-	0	-	-	-	0	0
Lepomis spp.	-		-	0	-	-	-	0	0
Lophogobius cyprinoides	-		-	0	-	-	-	0	0
Menidia peninsulae	-		-	0	-	-	-	0	0
Micropterus salmoides	-		-	0	-	-	-	0	0
Mugil cephalus	-		-	0	-	-	-	0	0
Noturus gyrinus	-	Sampled	-	0	-	-	-	0	0
Opsanus beta	-		-	0	-	-	-	0	0
Oreochromis aureus	-		-	0	-	-	-	0	0
Pogonias chromis	-		-	0	-	-	-	0	0
Scianops ocellatus	-		-	0	-	-	-	0	0
Sphyraena barracuda	-		-	0	-	-	-	0	0
Strongylura notata	-		-	0	-	-	-	0	0
Syngnathus louisianae	-		-	0	-	-	-	0	0
Tilapia mariae	-		-	0	-	-	-	0	0
Trinectes maculatus	-		-	0	-	-	-	0	0
Total	177.3		18.96	196.25	1.32	2	11.96	15.28	211.54
Mean				98.13				5.09	42.31
Net efficiency	0.9	0	0.9	0.9	0.7	1	0.9	0.87	0.88
Efficiency adjusted total	197		21.07	218.07	1.89	2	13.29	17.18	235.25
Efficiency adjusted Mean				109.04				5.73	47.05
Efficiency adjusted SE				87.965				3.7818	37.662
Efficiency Adjusted variance				15476				42.906	

5	#NETS
2	#DEEP
3	#FLATS
Temp:	
23	
Salin:	
2	
Depth:	
13	
#Species:	
56	
Day:	
19	
Month:	
1	
Year:	
1996	

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in January 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania goodeii	10.12	10.79	7.01	27.93	1.85	2.41	0.64	4.9	32.83
Lophogobius cyprinoides	16.35	9.59	7.08	33.02	-	-	-	0	33.02
Lucania parva	1.62	1.68	3.78	7.08	4.25	1.24	1.94	7.43	14.51
Lepomis punctatus	9.14	3.4	2.94	15.48	-	-	-	0	15.48
Microgobius gulosus	1.07	5.42	0.89	7.39	-	-	-	0	7.39
Cyprinodon variegatus	-	-	-	0	1.98	0.21	0.32	2.51	2.51
Notropis sp.	2.36	-	-	2.36	0.28	-	0.09	0.37	2.73
Fundulus seminolis	-	-	-	0	0.69	-	-	0.69	0.69
Poecilia latipinna	-	-	-	0	0.24	-	-	0.24	0.24
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	40.67	30.89	21.7	93.26	9.29	3.86	2.99	16.14	109.4
Mean				31.09				5.38	18.23
Net efficiency	1	1	0.83	0.94	0.6	0.8	1	0.8	0.87
Efficiency adjusted total	40.67	30.89	26.14	97.7	15.48	4.82	2.99	23.29	120.99
Efficiency adjusted Mean				32.57				7.76	20.16
Efficiency adjusted SE				4.2774				3.8943	6.1199
Efficiency Adjusted variance				54.889				45.497	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
22	
Salin:	
0	
Depth:	
19	
#Species:	
56	
Day:	
25	
Month:	
1	
Year:	
1996	

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in February 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	14.8	9.56	25.2	49.56	0.48	0.77	1.51	2.76	52.32
Opsanus beta	27.03	-	-	27.03	-	-	-	0	27.03
Poecilia latipinna	24.17	-	0.58	24.75	-	-	-	0	24.75
Floridichthys carpio	3.73	0.88	4.52	9.13	0.29	0.56	0.41	1.26	10.4
Lucania parva	2.54	0.18	1.17	3.88	0.18	0.22	0.42	0.82	4.7
Microgobius gulosus	1.68	0.35	3.17	5.2	0.24	-	-	0.24	5.44
Fundulus grandis	-	0.68	0.94	1.62	-	0.11	0.25	0.36	1.98
Gambusia holbrooki	1.54	-	-	1.54	-	-	-	0	1.54
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	75.49	11.65	35.58	122.72	1.19	1.66	2.59	5.43	128.16
Mean				40.91				1.81	21.36
Net efficiency	0.79	0.8	0.8	0.8	0.79	0.75	0.92	0.82	0.81
Efficiency adjusted total	95.56	14.56	44.47	154.59	1.51	2.21	2.82	6.54	161.13
Efficiency adjusted Mean				51.53				2.18	26.86
Efficiency adjusted SE				23.648				0.3785	15.285
Efficiency Adjusted variance				1677.6				0.4297	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
20
Depth:
25
#Species:
56
Day:
7
Month:
3
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in February 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus confluentus	16.58	26.65		43.23				0	43.23
Cyprinodon variegatus	0.08	-		0.08				0	0.08
Adinia xenica	-	-		0				0	0
Ameirus natalis	-	-		0				0	0
Ameirus natalis	-	-		0				0	0
Anchoa mitchili	-	-		0				0	0
Belonesox belizanus	-	-		0				0	0
Cichlasoma bimaculatum	-	-		0				0	0
Cichlasoma urophthalmus	-	-		0				0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-		0				0	0
Clarias batrachus	-	-		0				0	0
Cynoscion nebulosus	-	-		0				0	0
Elassoma evergladei	-	-		0				0	0
Elops saurus	-	-		0				0	0
Enneacanthus gloriosus	-	-		0				0	0
Erimyzon sucetta	-	-		0				0	0
Floridichthys carpio	-	-		0				0	0
Fundulus chrysotus	-	-		0				0	0
Fundulus grandis	-	-	Net	0	Net	Net	Net	0	0
Fundulus grandis (>6.5 cm)	-	-		0				0	0
Fundulus seminolis	-	-		0				0	0
Fundulus similis	-	-		0				0	0
Fundulus similis (>6.5 cm)	-	-		0				0	0
Gambusia holbrooki	-	-		0				0	0
Gerridae spp.	-	-		0				0	0
Gobiosoma bosci	-	-		0				0	0
Gobiosoma robustum	-	-		0				0	0
Heterandria formosa	-	-		0				0	0
Jordanella floridae	-	-		0				0	0
Large Gerridae spp.	-	-		0				0	0
LARVAE	-	-		0				0	0
Lepomis gulosus	-	-		0				0	0
Lepomis macrochirus	-	-	Not	0	Net	Net	Net	0	0
Lepomis marginatus	-	-		0				0	0
Lepomis micolophus	-	-	Net	0				0	0
Lepomis punctatus	-	-		0				0	0
Lepomis spp.	-	-		0				0	0
Lophogobius cyprinoides	-	-		0				0	0
Lucania goodeii	-	-		0				0	0
Lucania parva	-	-	Sampled	0				0	0
Menidia peninsulae	-	-		0				0	0
Microgobius gulosus	-	-		0				0	0
Micropterus salmoides	-	-		0				0	0
Mugil cephalus	-	-		0				0	0
Notropis sp.	-	-		0				0	0
Noturus gyrinus	-	-	Sampled	0	Dry	Dry	Dry	0	0
Opsanus beta	-	-		0				0	0
Oreochromis aureus	-	-		0				0	0
Poecilia latipinna	-	-	Not	0	Dry	Dry	Dry	0	0
Pogonias chromis	-	-		0				0	0
Scianops ocellatus	-	-		0				0	0
Sphyraena barracuda	-	-		0				0	0
Strongylura notata	-	-		0				0	0
Syngnathus louisianae	-	-		0				0	0
Tilapia mariae	-	-		0				0	0
Trinectes maculatus	-	-		0				0	0
Total	16.66	26.65		43.31				0	43.31
Mean				21.66					21.66
Net efficiency	0.9	0.91	0	0.91	0	0	0		0.91
Efficiency adjusted total	18.51	29.29		47.8					47.8
Efficiency adjusted Mean				23.9					23.9
Efficiency adjusted SE				5.39					5.39
Efficiency Adjusted variance				58.104				0	

2 #NETS
2 #DEEP
0 #FLATS

Temp:
21
Salin:
5
Depth:
5
#Species:
56
Day:
5
Month:
3
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in February 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Poecilia latipinna	175.45	53.44	33.89	262.78	Dry	Dry	Dry	0	262.78
Fundulus confluentus	16.31	145.24	41.84	203.39				0	203.39
Fundulus grandis (>6.5 cm)	78.96	-	61.8	140.76				0	140.76
Lepomis punctatus	78.75	0.43	-	79.18				0	79.18
Cyprinodon variegatus	8.82	9.49	41.14	59.45				0	59.45
Lucania parva	2.66	10.2	5.53	18.4				0	18.4
Fundulus chrysotus	0.77	15.02	2.43	18.22				0	18.22
Jordanella floridae	2.31	13.25	-	15.56				0	15.56
Lucania goodeii	1.95	2.91	0.79	5.65				0	5.65
Gambusia holbrooki	0.36	0.7	1.22	2.28				0	2.28
Lepomis marginatus	-	-	1.32	1.32				0	1.32
Adinia xenica	-	-	-	0				0	0
Ameirus natalis	-	-	-	0				0	0
Ameirus natalis	-	-	-	0				0	0
Anchoa mitchili	-	-	-	0				0	0
Belonesox belizanus	-	-	-	0				0	0
Cichlasoma bimaculatum	-	-	-	0				0	0
Cichlasoma urophthalmus	-	-	-	0				0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0				0	0
Clarias batrachus	-	-	-	0				0	0
Cynoscion nebulosus	-	-	-	0				0	0
Elassoma evergladei	-	-	-	0				0	0
Elops saurus	-	-	-	0				0	0
Enneacanthus gloriosus	-	-	-	0				0	0
Erimyzon sucetta	-	-	-	0				0	0
Floridichthys carpio	-	-	-	0				0	0
Fundulus grandis	-	-	-	0	Net	Net	Net	0	0
Fundulus seminolis	-	-	-	0				0	0
Fundulus similis	-	-	-	0				0	0
Fundulus similis (>6.5 cm)	-	-	-	0				0	0
Gerridae spp.	-	-	-	0				0	0
Gobiosoma bosci	-	-	-	0				0	0
Gobiosoma robustum	-	-	-	0				0	0
Heterandria formosa	-	-	-	0				0	0
Large Gerridae spp.	-	-	-	0				0	0
LARVAE	-	-	-	0				0	0
Lepomis gulosus	-	-	-	0				0	0
Lepomis macrochirus	-	-	-	0	Net	Net	Net	0	0
Lepomis micolophus	-	-	-	0				0	0
Lepomis spp.	-	-	-	0				0	0
Lophogobius cyprinoides	-	-	-	0				0	0
Menidia peninsulae	-	-	-	0				0	0
Microgobius gulosus	-	-	-	0				0	0
Micropterus salmoides	-	-	-	0				0	0
Mugil cephalus	-	-	-	0				0	0
Notropis sp.	-	-	-	0				0	0
Noturus gyrinus	-	-	-	0	Dry	Dry	Dry	0	0
Opsanus beta	-	-	-	0				0	0
Oreochromis aureus	-	-	-	0				0	0
Pogonias chromis	-	-	-	0				0	0
Scianops ocellatus	-	-	-	0				0	0
Sphyraena barracuda	-	-	-	0				0	0
Strongylura notata	-	-	-	0				0	0
Syngnathus louisianae	-	-	-	0				0	0
Tilapia mariae	-	-	-	0				0	0
Trinectes maculatus	-	-	-	0				0	0
Total	366.35	250.68	189.96	807				0	807
Mean				269					269
Net efficiency	0.8	0.9	0.8	0.83	0	0	0		0.83
Efficiency adjusted total	457.94	278.53	237.45	973.92					973.92
Efficiency adjusted Mean				324.64					324.64
Efficiency adjusted SE				67.697					67.697
Efficiency Adjusted variance				13749				0	

3	#NETS
3	#DEEP
0	#FLATS
Temp:	
26	
Salin:	
4	
Depth:	
-4	
#Species:	
56	
Day:	
28	
Month:	
2	
Year:	
1996	

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in February 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania goodeii	13.35	31.65	18.8	63.8				0	63.8
Lucania parva	9.57	16.17	19.01	44.76				0	44.76
Poecilia latipinna	24.56	12.83	5.2	42.59	Dry	Dry	Dry	0	42.59
Fundulus confluentus	15.7	-	15.1	30.8				0	30.8
Cyprinodon variegatus	5.76	1.33	21.6	28.69				0	28.69
Microgobius gulosus	4.45	7.27	1.24	12.96				0	12.96
Lepomis spp.	12.75	-	-	12.75				0	12.75
Lophogobius cyprinoides	-	4.59	-	4.59				0	4.59
Gambusia holbrooki	2.67	0.33	1.44	4.44				0	4.44
Enneacanthus gloriosus	-	-	3.79	3.79				0	3.79
Lepomis punctatus	-	2.89	-	2.89				0	2.89
Fundulus chrysotus	1.49	0.69	-	2.18				0	2.18
Notropis sp.	-	1.02	-	1.02				0	1.02
Jordanella floridae	0.56	-	0.31	0.87				0	0.87
Elassoma evergladei	0.07	0.15	0.12	0.34				0	0.34
Adinia xenica	-	-	-	0				0	0
Ameirus natalis	-	-	-	0				0	0
Ameirus natalis	-	-	-	0				0	0
Anchoa mitchili	-	-	-	0				0	0
Belonesox belizanus	-	-	-	0				0	0
Cichlasoma bimaculatum	-	-	-	0				0	0
Cichlasoma urophthalmus	-	-	-	0				0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0				0	0
Clarias batrachus	-	-	-	0				0	0
Cynoscion nebulosus	-	-	-	0				0	0
Elops saurus	-	-	-	0				0	0
Erimyzon sucetta	-	-	-	0				0	0
Floridichthys carpio	-	-	-	0				0	0
Fundulus grandis	-	-	-	0	Net	Net	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0				0	0
Fundulus seminolis	-	-	-	0				0	0
Fundulus similis	-	-	-	0				0	0
Fundulus similis (>6.5 cm)	-	-	-	0				0	0
Gerridae spp.	-	-	-	0				0	0
Gobiosoma bosci	-	-	-	0				0	0
Gobiosoma robustum	-	-	-	0				0	0
Heterandria formosa	-	-	-	0				0	0
Large Gerridae spp.	-	-	-	0				0	0
LARVAE	-	-	-	0				0	0
Lepomis gulosus	-	-	-	0				0	0
Lepomis macrochirus	-	-	-	0	Net	Net	Net	0	0
Lepomis marginatus	-	-	-	0				0	0
Lepomis micolophus	-	-	-	0				0	0
Menidia peninsulae	-	-	-	0				0	0
Micropterus salmoides	-	-	-	0				0	0
Mugil cephalus	-	-	-	0				0	0
Noturus gyrinus	-	-	-	0	Dry	Dry	Dry	0	0
Opsanus beta	-	-	-	0				0	0
Oreochromis aureus	-	-	-	0				0	0
Pogonias chromis	-	-	-	0				0	0
Scianops ocellatus	-	-	-	0				0	0
Sphyraena barracuda	-	-	-	0				0	0
Strongylura notata	-	-	-	0				0	0
Syngnathus louisianae	-	-	-	0				0	0
Tilapia mariae	-	-	-	0				0	0
Trinectes maculatus	-	-	-	0				0	0
Total	90.93	78.92	86.62	256.48				0	256.48
Mean				85.49					85.49
Net efficiency	1	0.9	1	0.97	0	0	0		0.97
Efficiency adjusted total	90.93	87.69	86.62	265.24					265.24
Efficiency adjusted Mean				88.41					88.41
Efficiency adjusted SE				1.2957					1.2957
Efficiency Adjusted variance				5.0365				0	

3 #NETS
3 #DEEP
0 #FLATS

Temp:
25
Salin:
1
Depth:
2
#Species:
56
Day:
27
Month:
2
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in March 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	12.54	2.02	0.85	15.4	9.73	44.7	18.2	72.62	88.03
Fundulus grandis (>6.5 cm)	-	-	16.31	16.31	-	-	-	0	16.31
Cyprinodon variegatus	-	-	-	0	2.02	0.79	-	2.81	2.81
Gerridae spp.	2.06	-	3.45	5.51	-	-	1.42	1.42	6.93
Opsanus beta	6	-	-	6	-	-	-	0	6
Lucania parva	2.59	0.14	0.59	3.32	-	0.19	0.35	0.54	3.86
Poecilia latipinna	3.05	-	-	3.05	-	-	-	0	3.05
Microgobius gulosus	1.61	-	-	1.61	0.28	-	-	0.28	1.89
Menidia peninsulae	2.73	-	-	2.73	-	-	-	0	2.73
Fundulus confluentus	-	0.13	-	0.13	-	-	-	0	0.13
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	30.57	2.29	21.2	54.06	12.03	45.68	19.97	77.67	131.73
Mean				18.02				25.89	21.96
Net efficiency	0.79	1	0.9	0.9	0.79	0.95	0.92	0.89	0.89
Efficiency adjusted total	38.7	2.29	23.56	64.55	15.23	48.08	21.71	85.02	149.57
Efficiency adjusted Mean				21.52				28.34	24.93
Efficiency adjusted SE				10.56				10.046	6.6944
Efficiency Adjusted variance				334.55				302.75	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
24
Depth:
18
#Species:
56
Day:
19
Month:
4
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in March 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	30	7.27	46.33	83.6	0.35	0.39		0.74	84.34
Fundulus grandis (>6.5 cm)	48.75	18.41	7.65	74.81	-	-		0	74.81
Poecilia latipinna	8.77	4.67	14.96	28.4	-	-	Not	0	28.4
Lucania parva	4.5	5.26	9.1	18.86	0.9	-	Sampled	0.9	19.76
Fundulus confluentus	-	3.9	10.23	14.14	-	-		0	14.14
Fundulus grandis	10.35	-	-	10.35	-	-	Net	0	10.35
Lucania goodeii	-	0.34	1.66	2	-	-		0	2
Menidia peninsulae	0.17	0.1	1.16	1.43	-	-		0	1.43
Adinia xenica	-	-	-	0	0.15	-		0.15	0.15
Gambusia holbrooki	-	0.18	0.32	0.5	-	0.09		0.09	0.59
Microgobius gulosus	0.76	-	-	0.76	-	-		0	0.76
Ameirus natalis	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-		0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus chrysotus	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	0		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-	Sampled	0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	103.28	40.13	91.43	234.84	1.4	0.49		1.89	236.73
Mean				78.28				0.94	47.35
Net efficiency	1	1	1	1	0.9	0.6	0	0.75	0.9
Efficiency adjusted total	103.28	40.13	91.43	234.84	1.56	0.82		2.38	237.22
Efficiency adjusted Mean				78.28				1.19	47.44
Efficiency adjusted SE				19.379				0.37	21.662
Efficiency Adjusted variance				1126.7				0.2738	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
27
Salin:
6
Depth:
8
#Species:
56
Day:
16
Month:
4
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in March 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Poecilia latipinna	2.46	67.88	0.16	70.5	-	-	-	0	70.5
Lucania parva	11.19	11.69	20.05	42.93	0.23	-	-	0.23	43.16
Fundulus confluentus	0.44	8.88	0.48	9.8	-	2.18	0.73	2.91	12.71
Cyprinodon variegatus	0.52	-	3.99	4.51	0.29	0.95	0.56	1.8	6.31
Menidia peninsulae	5.83	0.32	1.2	7.35	-	-	-	0	7.35
Fundulus grandis (>6.5 cm)	-	7.16	-	7.16	-	-	-	0	7.16
Cichlasoma urophthalmus	-	5.04	-	5.04	-	-	-	0	5.04
Gambusia holbrooki	0.49	1.73	0.2	2.42	-	-	-	0	2.42
Lucania goodeii	0.97	0.14	0.99	2.1	-	-	-	0	2.1
Fundulus chrysotus	-	0.96	0.11	1.07	-	-	-	0	1.07
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	21.9	103.8	27.18	152.88	0.52	3.13	1.29	4.94	157.82
Mean				50.96				1.65	26.3
Net efficiency	0.9	0.9	0.4	0.73	0.9	1	0.9	0.93	0.83
Efficiency adjusted total	24.33	115.33	67.95	207.61	0.58	3.13	1.43	5.14	212.75
Efficiency adjusted Mean				69.2				1.71	35.46
Efficiency adjusted SE				26.277				0.7496	19.13
Efficiency Adjusted variance				2071.4				1.6859	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
23
Salin:
17
Depth:
9
#Species:
56
Day:
12
Month:
4
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in March 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Micropterus salmoides	143.69	-	-	143.69	-	-		0	143.69
Lucania parva	11.24	12.25	14.16	37.65	0.34	0.95	Sampled	1.29	38.94
Poecilia latipinna	-	21.85	9.41	31.26	-	-	Not	0	31.26
Cichlasoma urophthalmus (>6.5 cm)	-	-	18.92	18.92	-	-		0	18.92
Lucania goodeii	5.52	5.14	5.14	15.8	-	-		0	15.8
Lepomis punctatus	3.18	4.16	3.41	10.75	-	-		0	10.75
Lophogobius cyprinoides	4.56	5.28	-	9.84	-	-		0	9.84
Fundulus confluentus	0.2	-	-	0.2	0.57	3.51		4.08	4.28
Microgobius gulosus	2.88	1.55	0.91	5.34	-	-		0	5.34
Fundulus similis	-	3.3	1.72	5.02	-	-		0	5.02
Cyprinodon variegatus	1.24	1.57	-	2.81	0.91	0.07		0.98	3.79
Fundulus chrysotus	1.12	2.48	0.43	4.03	-	-		0	4.03
Lepomis marginatus	-	-	2.9	2.9	-	-		0	2.9
Gambusia holbrooki	0.22	1.18	0.14	1.54	0.18	-		0.18	1.72
Menidia peninsulae	-	-	1.6	1.6	-	-		0	1.6
Enneacanthus gloriosus	-	1.07	-	1.07	-	-		0	1.07
Adinia xenica	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-		0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus grandis	-	-	-	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-	Sampled	0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	173.86	59.83	58.74	292.42	2	4.53		6.53	298.95
Mean				97.48				3.27	59.79
Net efficiency	1	0.9	1	0.97	0.6	0.6	0	0.6	0.82
Efficiency adjusted total	173.86	66.48	58.74	299.08	3.33	7.55		10.88	309.96
Efficiency adjusted Mean				99.69				5.44	61.99
Efficiency adjusted SE				37.151				2.11	30.782
Efficiency Adjusted variance				4140.5				8.9042	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
23
Salin:
6
Depth:
12
#Species:
56
Day:
10
Month:
4
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in April 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Large Gerridae spp.	-	-	-	0	-	27.89	-	27.89	27.89
Gerridae spp.	4.98	8.15	4.1	17.23	-	6.95	0.11	7.06	24.29
Floridichthys carpio	-	13.04	6.15	19.19	0.15	0.27	2.11	2.53	21.73
Microgobius gulosus	2.24	1.62	1.15	5.01	-	1.21	0.19	1.4	6.41
Lucania parva	3.85	1.73	1.03	6.61	0.18	-	0.36	0.54	7.15
Menidia peninsulae	0.41	-	-	0.41	-	-	-	0	0.41
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Cyprinodon variegatus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	11.48	24.54	12.44	48.46	0.34	36.32	2.77	39.42	87.88
Mean				16.15				13.14	14.65
Net efficiency	0.9	0.9	0.89	0.9	1	1	1	1	0.95
Efficiency adjusted total	12.76	27.27	13.98	54.01	0.34	36.32	2.77	39.43	93.44
Efficiency adjusted Mean				18				13.14	15.57
Efficiency adjusted SE				4.6467				11.61	5.697
Efficiency Adjusted variance				64.775				404.34	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
29
Salin:
25
Depth:
28
#Species:
58
Day:
1
Month:
6
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in April 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	13.35	6.86	12.48	32.68	6.68	12.37	-	19.06	51.74
Fundulus confluentus	27.1	27.83	10.35	65.29	1.25	1	-	2.26	67.55
Poecilia latipinna	3.05	3.28	17.23	23.55	0.26	-	-	0.26	23.81
Lucania parva	8.67	5.14	3.47	17.28	0.38	0.91	-	1.29	18.57
Fundulus grandis (>6.5 cm)	6.67	-	13.22	19.89	-	-	-	0	19.89
Fundulus grandis	1.36	-	8.62	9.98	-	-	-	0	9.98
Adinia xenica	0.72	1.05	-	1.77	-	0.15	-	0.15	1.92
Gambusia holbrooki	0.5	-	1.28	1.78	-	-	-	0	1.78
Cichlasoma urophthalmus	0.92	0.49	-	1.41	-	-	-	0	1.41
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	62.34	44.65	66.66	173.64	8.58	14.44	0	23.01	196.66
Mean				57.88				7.67	32.78
Net efficiency	0.9	0.9	1	0.93	1	1	0.5	0.83	0.88
Efficiency adjusted total	69.27	49.61	66.66	185.54	8.58	14.44	0	23.02	208.56
Efficiency adjusted Mean				61.85				7.67	34.76
Efficiency adjusted SE				6.1646				2.7887	10.843
Efficiency Adjusted variance				114.01				23.331	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
5
Depth:
9
#Species:
58
Day:
27
Month:
5
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in April 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	9.44	9.35	4.85	23.64	-	0.46	6.87	7.33	30.97
Cyprinodon variegatus	1.57	1.17	-	2.74	1.13	1.77	4.66	7.56	10.3
Fundulus confluentus	0.09	-	-	0.09	2.5	0.39	0.14	3.03	3.12
Poecilia latipinna	6.66	7.63	-	14.29	0.92	0.02	0.15	1.09	15.38
Gambusia holbrooki	-	0.06	-	0.06	-	-	0.85	0.85	0.91
Menidia peninsulae	-	-	-	0	-	0.15	-	0.15	0.15
Lucania goodeii	0.33	-	-	0.33	-	-	-	0	0.33
Cichlasoma urophthalmus	-	0.14	-	0.14	-	-	-	0	0.14
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	18.09	18.35	4.85	41.29	4.55	2.79	12.67	20.01	61.3
Mean				13.76				6.67	10.22
Net efficiency	1	1	0.6	0.87	0.7	1	0.9	0.87	0.87
Efficiency adjusted total	18.09	18.35	8.08	44.52	6.5	2.79	14.08	23.37	67.89
Efficiency adjusted Mean				14.84				7.79	11.32
Efficiency adjusted SE				3.3808				3.3224	2.6417
Efficiency Adjusted variance				34.29				33.114	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
28
Salin:
20
Depth:
19
#Species:
58
Day:
23
Month:
5
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in April 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	327.5	120.59	10.18	458.27				0	458.27
Lucania parva	18.97	29.91	16.71	65.59				0	65.59
Poecilia latipinna	19.73	21.93	14.01	55.67	Dry	Dry	Dry	0	55.67
Cyprinodon variegatus	10.93	2.39	15.18	28.49				0	28.49
Gambusia holbrooki	2.15	4.27	1.51	7.92				0	7.92
Microgobius gulosus	3.31	0.82	1.83	5.96				0	5.96
Fundulus seminolis	2.07	2.34	0.96	5.37				0	5.37
Cichlasoma urophthalmus	5.25	-	-	5.25				0	5.25
Menidia peninsulae	0.48	2.44	2.23	5.15				0	5.15
Fundulus chrysotus	1.35	2.99	-	4.34				0	4.34
Lophogobius cyprinoides	-	1.66	-	1.66				0	1.66
Lucania goodeii	0.39	0.65	-	1.04				0	1.04
Gobiosoma robustum	-	-	0.06	0.06				0	0.06
Adinia xenica	-	-	-	0				0	0
Ameirus natalis	-	-	-	0				0	0
Anchoa mitchili	-	-	-	0				0	0
Belonesox belizanus	-	-	-	0				0	0
Cichlasoma bimaculatum	-	-	-	0				0	0
Clarias batrachus	-	-	-	0	Dry	Dry	Dry	0	0
Cynoscion nebulosus	-	-	-	0				0	0
Elassoma evergladei	-	-	-	0				0	0
Elops saurus	-	-	-	0				0	0
Enneacanthus gloriosus	-	-	-	0				0	0
Erimyzon sucetta	-	-	-	0				0	0
Floridichthys carpio	-	-	-	0				0	0
Fundulus confluentus	-	-	-	0				0	0
Fundulus grandis	-	-	-	0	Net	Net	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0				0	0
Fundulus similis	-	-	-	0				0	0
Fundulus similis (>6.5 cm)	-	-	-	0				0	0
Gerridae spp.	-	-	-	0				0	0
Gobiosoma bosci	-	-	-	0				0	0
Heterandria formosa	-	-	-	0				0	0
Ictalurus spp.	-	-	-	0				0	0
Jordanella floridae	-	-	-	0				0	0
Large Gerridae spp.	-	-	-	0				0	0
LARVAE	-	-	-	0				0	0
Lepisosteus platyrhincus	-	-	-	0				0	0
Lepomis gulosus	-	-	-	0				0	0
Lepomis macrochirus	-	-	-	0	Net	Net	Net	0	0
Lepomis marginatus	-	-	-	0				0	0
Lepomis micolophus	-	-	-	0				0	0
Lepomis punctatus	-	-	-	0				0	0
Lepomis spp.	-	-	-	0				0	0
Micropterus salmoides	-	-	-	0				0	0
Mugil cephalus	-	-	-	0				0	0
Notropis sp.	-	-	-	0				0	0
Noturus gyrinus	-	-	-	0				0	0
Opsanus beta	-	-	-	0				0	0
Oreochromis aureus	-	-	-	0				0	0
Pogonias chromis	-	-	-	0				0	0
Scianops ocellatus	-	-	-	0				0	0
Sphyraena barracuda	-	-	-	0				0	0
Strongylura notata	-	-	-	0				0	0
Syngnathus louisianae	-	-	-	0				0	0
Syngnathus scovelli	-	-	-	0				0	0
Tilapia mariae	-	-	-	0				0	0
Trinectes maculatus	-	-	-	0				0	0
Total	392.12	189.99	62.68	644.78				0	644.78
Mean				214.93					214.93
Net efficiency	1	1	1	1	0	0	0		1
Efficiency adjusted total	392.12	189.99	62.68	644.79					644.79
Efficiency adjusted Mean				214.93					214.93
Efficiency adjusted SE				95.915					95.915
Efficiency Adjusted variance				27599				0	

3 #NETS
3 #DEEP
0 #FLATS

Temp:
27
Salin:
18
Depth:
3
#Species:
58
Day:
19
Month:
5
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in June 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	3.27	0.69	17.97	21.93	-	1.43	6.78	8.21	30.14
Cyprinodon variegatus	1.15	5.48	5.82	12.45	2.86	-	1.62	4.48	16.93
Fundulus similis	-	-	-	0	-	-	6.26	6.26	6.26
Lucania parva	2.71	1.9	3.7	8.32	0.19	-	-	0.19	8.51
Fundulus grandis	-	-	8.8	8.8	-	-	-	0	8.8
Poecilia latipinna	2.03	-	6.57	8.6	-	-	-	0	8.6
Microgobius gulosus	3.61	1.63	0.34	5.57	-	0.54	-	0.54	6.11
Gerridae spp.	-	-	3.52	3.52	-	-	-	0	3.52
Trinectes maculatus	1.08	-	-	1.08	-	-	-	0	1.08
Menidia peninsulae	-	-	0.72	0.72	-	-	-	0	0.72
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Total	13.84	9.71	47.44	70.99	3.05	1.97	14.66	19.68	90.67
Mean				23.66				6.56	15.11
Net efficiency	1	0.94	0.9	0.95	1	1	1	1	0.97
Efficiency adjusted total	13.84	10.33	52.71	76.88	3.05	1.97	14.66	19.68	96.56
Efficiency adjusted Mean				25.63				6.56	16.09
Efficiency adjusted SE				13.58				4.062	7.6392
Efficiency Adjusted variance				553.21				49.499	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
32	
Salin:	
15	
Depth:	
14	
#Species:	
56	
Day:	
11	
Month:	
7	
Year:	
1996	

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in June 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	0.95	0.98	16.86	18.79	15.26	10.36	0.71	26.33	45.12
Lucania parva	3.62	2.63	2.55	8.81	-	1.15	0.43	1.58	10.39
Poecilia latipinna	0.3	1.79	-	2.09	-	2.13	-	2.13	4.22
Floridichthys carpio	-	5.27	-	5.27	-	-	-	0	5.27
Cichlasoma urophthalmus	0.61	1.21	0.81	2.63	-	-	-	0	2.63
Gambusia holbrooki	1.37	0.24	-	1.61	-	-	-	0	1.61
Lepomis macrochirus	0.89	-	-	0.89	-	-	-	0	0.89
Microgobius gulosus	-	0.61	-	0.61	-	-	-	0	0.61
Menidia peninsulae	-	-	0.43	0.43	-	-	-	0	0.43
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	7.75	12.73	20.65	41.12	15.26	13.64	1.15	30.04	71.17
Mean				13.71				10.02	11.86
Net efficiency	0.9	0.9	0.98	0.93	1	1	1	1	0.96
Efficiency adjusted total	8.61	14.14	21.07	43.82	15.26	13.64	1.15	30.05	73.87
Efficiency adjusted Mean				14.61				10.02	12.31
Efficiency adjusted SE				3.6045				4.4579	2.7616
Efficiency Adjusted variance				38.976				59.619	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
0
Depth:
22
#Species:
56
Day:
3
Month:
7
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in June 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	5.38	3.25	11.14	19.77	16.06	14.1	10.23	40.38	60.15
Lucania parva	11.47	8.02	11.06	30.55	2.54	2.09	4.13	8.76	39.3
Fundulus confluentus	0.08	2.21	1.12	3.4	1.29	3.55	3.75	8.59	11.99
Cichlasoma urophthalmus	19.85	2.33	12.24	34.42	0.15	-	0.23	0.38	34.8
Fundulus grandis (>6.5 cm)	-	14.71	-	14.71	-	-	-	0	14.71
Gambusia holbrooki	0.75	1.32	-	2.07	0.2	-	0.12	0.32	2.39
Menidia peninsulae	0.75	0.58	-	1.33	-	-	0.27	0.27	1.6
Fundulus grandis	3.07	-	-	3.07	-	-	-	0	3.07
Poecilia latipinna	0.14	0.18	-	0.32	-	0.18	0.16	0.34	0.66
Lucania goodeii	0.48	-	0.35	0.83	-	-	-	0	0.83
Lepomis macrochirus	0.65	-	-	0.65	-	-	-	0	0.65
Lepomis spp.	-	0.15	-	0.15	-	-	-	0	0.15
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	42.61	32.74	35.92	111.27	20.24	19.91	18.89	59.04	170.31
Mean				37.09				19.68	28.39
Net efficiency	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.75
Efficiency adjusted total	60.87	46.77	51.31	158.95	25.3	24.89	23.61	73.8	232.75
Efficiency adjusted Mean				52.98				24.6	38.79
Efficiency adjusted SE				4.1554				0.509	6.6171
Efficiency Adjusted variance				51.803				0.7771	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
0
Depth:
34
#Species:
56
Day:
25
Month:
6
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in June 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	3.94	2.06	10.94	16.93	11.24	9.18	10.13	30.55	47.49
Microgobius gulosus	15.22	6.78	7.77	29.77	10.3	0.1	-	10.4	40.17
Lucania parva	-	6.49	3.59	10.08	1.7	4.44	7.65	13.79	23.87
Poecilia latipinna	1.8	3.24	7.48	12.52	1.42	1.75	1.12	4.29	16.81
Fundulus confluentus	-	-	-	0	2.2	0.11	3.78	6.09	6.09
Cichlasoma urophthalmus	-	1.88	0.3	2.18	-	2.36	-	2.36	4.54
Menidia peninsulae	1.29	-	-	1.29	1.95	0.11	1	3.05	4.34
Gambusia holbrooki	-	-	-	0	-	0.13	0.08	0.21	0.21
Lophogobius cyprinoides	-	-	0.08	0.08	-	-	-	0	0.08
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	22.24	20.46	30.15	72.85	28.8	18.17	23.76	70.73	143.58
Mean				24.28				23.58	23.93
Net efficiency	1	1	1	1	0.9	1	1	0.97	0.98
Efficiency adjusted total	22.24	20.46	30.15	72.85	32	18.17	23.76	73.93	146.78
Efficiency adjusted Mean				24.28				24.64	24.46
Efficiency adjusted SE				2.978				4.0167	2.2376
Efficiency Adjusted variance				26.605				48.402	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
29
Salin:
0
Depth:
36
#Species:
56
Day:
30
Month:
6
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in September 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	0.96	3.59	0.18	4.73	2.1	4.82	3.84	10.76	15.49
Opsanus beta	11.69	-	-	11.69	-	-	-	0	11.69
Lucania parva	1.24	1.31	0.06	2.61	-	0.52	0.88	1.4	4.01
Microgobius gulosus	0.98	-	-	0.98	0.77	-	0.82	1.59	2.57
Gerridae spp.	-	3.81	0.12	3.92	0.06	-	-	0.06	3.98
Trinectes maculatus	1.56	-	-	1.56	-	-	-	0	1.56
Cyprinodon variegatus	-	-	-	0	-	-	0.18	0.18	0.18
Cichlasoma urophthalmus	0.32	-	-	0.32	-	-	-	0	0.32
Poecilia latipinna	-	0.17	-	0.17	-	-	-	0	0.17
Gambusia holbrooki	0.07	-	0.06	0.13	-	-	-	0	0.13
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Total	16.82	8.88	0.42	26.11	2.93	5.34	5.71	13.99	40.1
Mean				8.71				4.66	6.68
Net efficiency	0.86	0.8	1	0.89	1	1	1	1	0.94
Efficiency adjusted total	19.56	11.1	0.42	31.08	2.93	5.34	5.71	13.98	45.06
Efficiency adjusted Mean				10.36				4.66	7.51
Efficiency adjusted SE				5.5376				0.8716	2.8124
Efficiency Adjusted variance				91.996				2.2789	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
31
Salin:
17
Depth:
17
#Species:
58
Day:
31
Month:
8
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in September 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	2.77	0.38	0.03	3.18	3.89	4.68	18.66	27.23	30.41
Cichlasoma urophthalmus	3.55	6.42	7.75	17.72	1.54	-	0.32	1.86	19.58
Gerridae spp.	-	-	-	0	2.63	-	-	2.63	2.63
Fundulus confluentus	-	-	-	0	-	0.52	2.1	2.62	2.62
Lucania parva	0.98	0.84	0.17	1.99	-	-	-	0	1.99
Strongylura notata	-	1.96	-	1.96	-	-	-	0	1.96
Lepomis punctatus	-	0.47	-	0.47	-	-	-	0	0.47
Gambusia holbrooki	0.17	0.23	-	0.4	-	-	-	0	0.4
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	7.47	10.3	7.95	25.72	8.06	5.2	21.08	34.34	60.06
Mean				8.57				11.45	10.01
Net efficiency	0.4	1	0.6	0.67	1	1	0.75	0.92	0.79
Efficiency adjusted total	18.67	10.3	13.25	42.22	8.06	5.2	28.11	41.37	83.59
Efficiency adjusted Mean				14.07				13.79	13.93
Efficiency adjusted SE				2.451				7.2074	3.4051
Efficiency Adjusted variance				18.023				155.84	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
32
Salin:
0
Depth:
21
#Species:
58
Day:
6
Month:
9
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in September 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	23.86	-	-	23.86	23.86
Cyprinodon variegatus	0.33	1.61	-	1.94	13.08	0.06	6.61	19.74	21.68
Fundulus grandis	-	-	-	0	-	12.26	4.69	16.95	16.95
Cichlasoma urophthalmus	22	11.63	10.59	44.23	2.94	-	3.43	6.37	50.6
Poecilia latipinna	0.13	-	-	0.13	11.85	-	-	11.85	11.98
Fundulus confluentus	-	-	-	0	7.53	0.19	2.55	10.27	10.27
Lucania parva	3.07	3.1	3.03	9.2	1.54	0.78	6.68	9	18.21
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	7.84	7.84	7.84
Adinia xenica	-	-	-	0	0.43	-	-	0.43	0.43
Lepomis punctatus	0.41	2.55	-	2.96	-	-	-	0	2.96
Gambusia holbrooki	0.14	1.02	-	1.16	-	-	0.13	0.13	1.29
Microgobius gulosus	2.1	-	-	2.1	-	-	-	0	2.1
Trinectes maculatus	0.62	0.2	-	0.82	-	-	-	0	0.82
Gobiosoma bosci	0.73	-	-	0.73	-	-	-	0	0.73
Ictalurus spp.	-	0.4	-	0.4	-	-	-	0	0.4
Lucania goodeii	-	0.13	-	0.13	-	-	-	0	0.13
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Total	29.53	20.65	13.62	63.8	61.23	13.29	31.93	106.46	170.26
Mean				21.27				35.48	28.38
Net efficiency	1	1	1	1	0.9	0.875	0.8	0.86	0.93
Efficiency adjusted total	29.53	20.65	13.62	63.8	68.03	15.19	39.91	123.13	186.93
Efficiency adjusted Mean				21.27				41.04	31.16
Efficiency adjusted SE				4.6032				15.264	8.39
Efficiency Adjusted variance				63.567				698.98	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
29
Salin:
0
Depth:
19
#Species:
58
Day:
27
Month:
8
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in September 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	1.15	0.46		1.61	6.07	8.9	15.54	30.52	32.13
Lucania parva	7.04	5.78	Sampled	12.82	1.28	1.39	0.23	2.9	15.72
Cichlasoma urophthalmus	1.66	4.75		6.41	1.37	2.59	0.57	4.53	10.94
Poecilia latipinna	0.94	1.19	Not	2.13	5.28	1.76	1.51	8.55	10.68
Fundulus grandis (>6.5 cm)	-	-		0	-	8.94	-	8.94	8.94
Microgobius gulosus	0.68	3.02		3.7	1.06	-	-	1.06	4.76
Fundulus confluentus	-	-		0	-	2.86	1.93	4.79	4.79
Menidia peninsulae	0.66	-		0.66	1.5	-	-	1.5	2.16
Lepomis spp.	1.81	-		1.81	-	-	-	0	1.81
Gambusia holbrooki	0.08	0.06		0.14	-	0.54	0.15	0.69	0.83
Tilapia mariae	0.31	-		0.31	-	-	-	0	0.31
Adinia xenica	-	-		0	-	-	-	0	0
Ameirus natalis	-	-		0	-	-	-	0	0
Anchoa mitchili	-	-		0	-	-	-	0	0
Belonesox belizanus	-	-		0	-	-	-	0	0
Cichlasoma bimaculatum	-	-		0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-		0	-	-	-	0	0
Clarias batrachus	-	-	Sampled	0	-	-	-	0	0
Cynoscion nebulosus	-	-		0	-	-	-	0	0
Elassoma evergladei	-	-		0	-	-	-	0	0
Elops saurus	-	-		0	-	-	-	0	0
Enneacanthus gloriosus	-	-		0	-	-	-	0	0
Erimyzon sucetta	-	-		0	-	-	-	0	0
Floridichthys carpio	-	-		0	-	-	-	0	0
Fundulus chrysotus	-	-		0	-	-	-	0	0
Fundulus grandis	-	-	Net	0	-	-	-	0	0
Fundulus seminolis	-	-		0	-	-	-	0	0
Fundulus similis	-	-		0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-		0	-	-	-	0	0
Gerridae spp.	-	-		0	-	-	-	0	0
Gobiosoma bosci	-	-		0	-	-	-	0	0
Gobiosoma robustum	-	-		0	-	-	-	0	0
Heterandria formosa	-	-		0	-	-	-	0	0
Ictalurus spp.	-	-		0	-	-	-	0	0
Jordanella floridae	-	-		0	-	-	-	0	0
Large Gerridae spp.	-	-		0	-	-	-	0	0
LARVAE	-	-		0	-	-	-	0	0
Lepisosteus platyrhincus	-	-		0	-	-	-	0	0
Lepomis gulosus	-	-		0	-	-	-	0	0
Lepomis macrochirus	-	-	Not	0	-	-	-	0	0
Lepomis marginatus	-	-		0	-	-	-	0	0
Lepomis micolophus	-	-	Net	0	-	-	-	0	0
Lepomis punctatus	-	-		0	-	-	-	0	0
Lophogobius cyprinoides	-	-		0	-	-	-	0	0
Lucania goodeii	-	-		0	-	-	-	0	0
Micropterus salmoides	-	-		0	-	-	-	0	0
Mugil cephalus	-	-		0	-	-	-	0	0
Notropis sp.	-	-		0	-	-	-	0	0
Noturus gyrinus	-	-		0	-	-	-	0	0
Opsanus beta	-	-		0	-	-	-	0	0
Oreochromis aureus	-	-		0	-	-	-	0	0
Pogonias chromis	-	-		0	-	-	-	0	0
Scianops ocellatus	-	-		0	-	-	-	0	0
Sphyraena barracuda	-	-		0	-	-	-	0	0
Strongylura notata	-	-		0	-	-	-	0	0
Syngnathus louisianae	-	-		0	-	-	-	0	0
Syngnathus scovelli	-	-		0	-	-	-	0	0
Trinectes maculatus	-	-		0	-	-	-	0	0
Total	14.33	15.26		29.59	16.56	26.99	19.92	63.47	93.06
Mean				14.8				21.16	18.61
Net efficiency	1	1	0	1	0.875	1	0.6	0.83	0.9
Efficiency adjusted total	14.33	15.26		29.59	18.93	26.99	33.2	79.12	108.71
Efficiency adjusted Mean				14.8				26.37	21.74
Efficiency adjusted SE				0.465				4.1309	3.631
Efficiency Adjusted variance				0.4325				51.193	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
28
Salin:
0
Depth:
16
#Species:
58
Day:
22
Month:
8
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in November 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	0.71	1.19	0.56	2.46	0.5	3.66	1.46	5.61	8.07
Gerridae spp.	3.16	8.63	-	11.79	0.74	-	-	0.74	12.53
Lucania parva	1.36	2.16	1.45	4.97	0.69	0.24	1.24	2.17	7.14
Microgobius gulosus	1.63	0.43	1.25	3.31	0.61	0.77	0.13	1.51	4.82
Cichlasoma urophthalmus	-	-	1.22	1.22	-	-	-	0	1.22
Menidia peninsulae	-	-	-	0	-	0.08	-	0.08	0.08
Gambusia holbrooki	0.09	-	-	0.09	-	-	-	0	0.09
Strongylura notata	0.08	-	-	0.08	-	-	-	0	0.08
Poecilia latipinna	-	-	0.07	0.07	-	-	-	0	0.07
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Cyprinodon variegatus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	7.03	12.41	4.55	23.99	2.54	4.75	2.83	10.12	34.1
Mean				8				3.37	5.68
Net efficiency	1	0.86	0.92	0.93	0.9	0.87	0.92	0.9	0.91
Efficiency adjusted total	7.03	14.43	4.95	26.41	2.82	5.46	3.08	11.36	37.77
Efficiency adjusted Mean				8.8				3.79	6.3
Efficiency adjusted SE				2.8767				0.84	1.7477
Efficiency Adjusted variance				24.826				2.117	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
27	
Salin:	
12	
Depth:	
25	
#Species:	
56	
Day:	
31	
Month:	
10	
Year:	
1996	

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in November 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	1.9	1.76	1.89	5.55	13.23	1.22	6.94	21.39	26.95
Gerridae spp.	-	-	-	0	2.92	-	-	2.92	2.92
Large Gerridae spp.	-	-	7.85	7.85	-	-	-	0	7.85
Fundulus confluentus	-	0.18	-	0.18	-	1.1	0.05	1.15	1.33
Lucania parva	0.58	0.17	0.18	0.93	-	0.76	-	0.76	1.69
Cichlasoma urophthalmus	1.09	1.44	0.18	2.71	0.08	-	-	0.08	2.79
Gambusia holbrooki	-	0.32	0.29	0.61	-	0.02	-	0.02	0.63
Lucania goodeii	0.21	0.38	-	0.59	-	-	-	0	0.59
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	3.78	4.25	10.39	18.42	16.23	3.1	7	26.32	44.75
Mean				6.14				8.78	7.46
Net efficiency	0.83	0.94	0.6	0.79	0.94	0.8	1	0.91	0.85
Efficiency adjusted total	4.55	4.52	17.32	26.39	17.27	3.87	7	28.14	54.53
Efficiency adjusted Mean				8.8				9.38	9.09
Efficiency adjusted SE				4.2617				4.0472	2.6316
Efficiency Adjusted variance				54.486				49.138	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
0
Depth:
35
#Species:
56
Day:
22
Month:
10
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in November 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	1.79	0.5	7.03	9.31	2.18	18.17	8.84	29.19	38.5
Fundulus confluentus	4.42	3.7	0.72	8.84	2.68	1.36	6.19	10.23	19.07
Lucania parva	6.5	5.3	6.01	17.81	3.48	1.29	4.05	8.81	26.63
Cichlasoma urophthalmus	7.96	21.78	5.69	35.43	0.35	1.5	0.62	2.47	37.9
Cichlasoma urophthalmus (>6.5 cm)	-	45.93	-	45.93	-	-	-	0	45.93
Lepomis punctatus	2.46	31.87	1.37	35.7	-	-	-	0	35.7
Poecilia latipinna	0.36	-	-	0.36	0.92	0.59	2.16	3.67	4.03
Gambusia holbrooki	0.52	2.28	1.05	3.85	0.59	0.73	0.52	1.84	5.69
Fundulus grandis	-	-	-	0	-	1.45	-	1.45	1.45
Lepomis macrochirus	-	-	5.61	5.61	-	-	-	0	5.61
Microgobius gulosus	1.21	-	-	1.21	-	-	-	0	1.21
Fundulus chrysotus	-	0.87	-	0.87	-	-	-	0	0.87
Gerridae spp.	0.83	-	-	0.83	-	-	-	0	0.83
Lucania goodeii	0.21	-	0.07	0.28	-	-	-	0	0.28
Tilapia mariae	0.13	-	-	0.13	-	-	-	0	0.13
Gobiosoma bosci	0.11	-	-	0.11	-	-	-	0	0.11
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	26.5	112.23	27.55	166.28	10.19	25.09	22.38	57.66	223.93
Mean				55.43				19.22	37.32
Net efficiency	1	1	1	1	1	1	0.8	0.93	0.97
Efficiency adjusted total	26.5	112.23	27.55	166.28	10.19	25.09	27.97	63.25	229.53
Efficiency adjusted Mean				55.43				21.08	38.26
Efficiency adjusted SE				28.403				5.5098	15.046
Efficiency Adjusted variance				2420.2				91.072	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
0
Depth:
32
#Species:
56
Day:
28
Month:
10
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in November 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	4.76	0.16	1.12	6.04	13.79	9.87	6.03	29.68	35.73
Poecilia latipinna	1.08	6.8	0.87	8.74	16.29	7.13	0.75	24.17	32.91
Cichlasoma urophthalmus	-	0.76	15.43	16.19	3.7	6.29	0.72	10.71	26.9
Lucania parva	2.95	3.11	1.23	7.29	1.75	2.77	1.38	5.9	13.2
Microgobius gulosus	0.56	1.18	1.43	3.17	1.17	-	-	1.17	4.34
Fundulus confluentus	-	-	-	0	-	2.51	-	2.51	2.51
Menidia peninsulae	-	2.82	-	2.82	-	-	-	0	2.82
Gambusia holbrooki	-	0.72	0.85	1.57	0.13	0.5	0.24	0.87	2.44
Tilapia mariae	0.99	-	1.02	2.02	-	-	-	0	2.02
Fundulus chrysotus	-	-	-	0	-	1.18	-	1.18	1.18
Lucania goodeii	-	-	-	0	0.18	-	-	0.18	0.18
Heterandria formosa	-	-	-	0	-	0.06	-	0.06	0.06
Belonesox belizanus	-	-	-	0	0.03	-	-	0.03	0.03
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	10.34	15.55	21.96	47.85	37.05	30.31	9.12	76.47	124.32
Mean				15.95				25.49	20.72
Net efficiency	0.9	0.4	0.86	0.72	0.9	0.7	1	0.87	0.79
Efficiency adjusted total	11.49	38.87	25.53	75.89	41.17	43.3	9.12	93.59	169.48
Efficiency adjusted Mean				25.3				31.2	28.25
Efficiency adjusted SE				7.9048				11.055	6.2195
Efficiency Adjusted variance				187.46				366.67	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
0
Depth:
38
#Species:
56
Day:
10
Month:
10
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in December 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	1.82	1.29	1.54	4.65	0.72	2.21	2.44	5.37	10.02
Microgobius gulosus	0.5	1.03	1.07	2.6	0.79	2.17	0.19	3.16	5.76
Lucania parva	0.54	0.68	1.31	2.54	0.21	0.14	0.77	1.12	3.66
Opsanus beta	3.37	-	-	3.37	-	-	-	0	3.37
Poecilia latipinna	0.5	-	2.03	2.53	-	-	0.2	0.2	2.73
Fundulus confluentus	-	-	-	0	-	-	0.22	0.22	0.22
Gambusia holbrooki	0.32	-	0.11	0.43	-	-	-	0	0.43
Gerridae spp.	0.21	-	-	0.21	-	-	-	0	0.21
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Cyprinodon variegatus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	7.27	3	6.08	16.34	1.72	4.52	3.83	10.07	26.41
Mean				5.45				3.36	4.4
Net efficiency	0.8	0.86	0.92	0.86	0.6	0.83	1	0.81	0.84
Efficiency adjusted total	9.09	3.49	6.61	19.19	2.87	5.45	3.83	12.15	31.34
Efficiency adjusted Mean				6.4				4.05	5.22
Efficiency adjusted SE				1.6201				0.7529	0.9558
Efficiency Adjusted variance				7.8742				1.7004	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
14
Depth:
22
#Species:
58
Day:
26
Month:
11
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in December 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	0.33	0.58	4.8	5.71	14.46	2.63	3.28	20.37	26.08
Cichlasoma urophthalmus	3.74	3.11	0.88	7.73	-	5.4	-	5.4	13.13
Fundulus confluentus	1.62	3.94	0.54	6.1	-	2.15	0.13	2.28	8.38
Gerridae spp.	6.19	0.17	-	6.36	-	-	-	0	6.36
Gambusia holbrooki	2.8	0.97	0.58	4.35	-	-	-	0	4.35
Lepomis punctatus	2.76	0.96	-	3.72	-	-	-	0	3.72
Microgobius gulosus	-	0.26	0.41	0.66	-	0.42	-	0.42	1.08
Lucania parva	0.83	0.31	0.47	1.61	-	-	-	0	1.61
Lucania goodeii	0.56	0.08	0.89	1.52	-	-	-	0	1.52
Poecilia latipinna	0.77	0.45	-	1.22	-	-	-	0	1.22
Noturus gyrinus	1.02	-	-	1.02	-	-	-	0	1.02
Lophogobius cyprinoides	-	0.37	-	0.37	-	-	-	0	0.37
Floridichthys carpio	-	-	0.23	0.23	-	-	-	0	0.23
Menidia peninsulae	-	0.02	-	0.02	-	-	-	0	0.02
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	20.63	11.21	8.79	40.63	14.46	10.6	3.41	28.47	69.1
Mean				13.54				9.49	11.52
Net efficiency	0.9	0.9	0.6	0.8	0.9	0.9	1	0.93	0.87
Efficiency adjusted total	22.92	12.46	14.65	50.03	16.07	11.78	3.41	31.26	81.29
Efficiency adjusted Mean				16.68				10.42	13.55
Efficiency adjusted SE				3.185				3.7174	2.5981
Efficiency Adjusted variance				30.433				41.456	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
5
Depth:
30
#Species:
58
Day:
22
Month:
11
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in December 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	34.24	65.21	1.26	100.71	0.55	0.58	1.89	3.02	103.73
Cyprinodon variegatus	0.86	0.28	1.18	2.32	2.72	3.13	5.71	11.56	13.88
Cichlasoma urophthalmus (>6.5 cm)	75.41	13.3	-	88.71	-	-	-	0	88.71
Clarias batrachus	84.55	-	-	84.55	-	-	-	0	84.55
Lepomis punctatus	20.03	34.97	0.15	55.15	-	-	-	0	55.15
Fundulus confluentus	-	-	-	0	2.78	1.8	2.44	7.02	7.02
Lepomis gulosus	52.02	-	-	52.02	-	-	-	0	52.02
Poecilia latipinna	-	27.32	-	27.32	1.27	-	-	1.27	28.59
Lucania parva	3.8	1.83	5.23	10.86	0.25	0.78	1.84	2.87	13.73
Gambusia holbrooki	1.81	1.14	0.75	3.7	0.53	0.25	0.61	1.4	5.1
Jordanella floridae	-	-	1.82	1.82	-	-	1.09	1.09	2.91
Lepomis marginatus	5.49	-	0.91	6.4	-	-	-	0	6.4
Fundulus chrysotus	-	-	1.13	1.13	-	-	0.18	0.18	1.32
Tilapia mariae	-	1.75	-	1.75	-	-	-	0	1.75
Lucania goodeii	0.26	-	1.14	1.4	-	-	-	0	1.4
Belonesox belizanus	-	0.35	0.68	1.03	-	-	-	0	1.03
Lepomis macrochirus	0.78	-	-	0.78	-	-	-	0	0.78
Microgobius gulosus	0.75	-	-	0.75	-	-	-	0	0.75
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	280	146.16	14.26	440.41	8.1	6.54	13.77	28.41	468.82
Mean				146.81				9.47	78.14
Net efficiency	0.7	1	0.74	0.81	0.91	0.9	0.84	0.88	0.85
Efficiency adjusted total	400	146.16	19.27	565.43	8.9	7.27	16.39	32.56	597.99
Efficiency adjusted Mean				188.48				10.85	99.67
Efficiency adjusted SE				111.93				2.808	63.91
Efficiency Adjusted variance				37582				23.655	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
2
Depth:
16
#Species:
58
Day:
19
Month:
11
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in December 1996

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	1.29	1.21	6.53	9.02	10.14	4.26	1.21	15.61	24.64
Lucania parva	6.72	6.04	7.78	20.54	2.85	2.88	0.69	6.42	26.96
Poecilia latipinna	2.21	1.1	5.57	8.88	9.44	0.42	0.98	10.84	19.71
Cichlasoma urophthalmus	3.21	3	5.57	11.78	0.38	2.99	1.17	4.54	16.32
Fundulus confluentus	-	-	-	0	-	1.45	2.72	4.18	4.18
Menidia peninsulae	3.51	-	0.66	4.17	0.11	-	-	0.11	4.28
Lucania goodeii	0.53	0.95	0.44	1.92	0.54	-	-	0.54	2.46
Microgobius gulosus	-	1.32	-	1.32	0.89	-	-	0.89	2.21
Gambusia holbrooki	0.25	0.07	0.9	1.22	-	0.79	-	0.79	2.01
Tilapia mariae	0.52	0.28	0.7	1.5	-	-	-	0	1.5
Fundulus chrysotus	-	-	-	0	-	0.21	0.15	0.36	0.36
Notropis sp.	-	-	-	0	0.31	-	-	0.31	0.31
Belonesox belizanus	-	-	-	0	-	0.26	-	0.26	0.26
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	18.24	13.97	28.14	60.36	24.66	13.26	6.92	44.84	105.2
Mean				20.12				14.95	17.53
Net efficiency	1	1	0.86	0.95	0.78	0.8	0.9	0.83	0.89
Efficiency adjusted total	18.24	13.97	32.72	64.93	31.62	16.57	7.69	55.88	120.81
Efficiency adjusted Mean				21.64				18.63	20.14
Efficiency adjusted SE				5.6738				6.9841	4.0803
Efficiency Adjusted variance				96.578				146.33	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
21
Salin:
0
Depth:
25
#Species:
58
Day:
14
Month:
11
Year:
1996

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in January 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus grandis	19.95	2.56	184.98	207.49	-	-	-	0	207.49
Fundulus grandis (>6.5 cm)	48.61	28.33	39.5	116.44	-	-	-	0	116.44
Cyprinodon variegatus	1.59	5.92	73.14	80.65	0.85	1.61	1.38	3.84	84.5
Fundulus similis (>6.5 cm)	58.44	-	-	58.44	-	-	-	0	58.44
Floridichthys carpio	47.73	1.49	5.75	54.98	0.27	0.29	0.21	0.77	55.74
Fundulus similis	9.86	-	14.64	24.5	-	-	-	0	24.5
Gerridae spp.	20.91	-	-	20.91	-	-	-	0	20.91
Opsanus beta	10.13	-	-	10.13	-	-	-	0	10.13
Lucania parva	1.22	0.64	0.79	2.65	0.47	0.06	0.21	0.74	3.39
Poecilia latipinna	0.9	1.57	2.85	5.32	-	-	-	0	5.32
Microgobius gulosus	0.67	0.38	1.71	2.76	0.06	0.24	0.12	0.42	3.18
Fundulus confluentus	-	-	-	0	0.82	-	0.22	1.04	1.04
Menidia peninsulae	3.76	-	-	3.76	-	-	-	0	3.76
Adinia xenica	-	-	0.87	0.87	-	-	-	0	0.87
Gambusia holbrooki	0.47	-	-	0.47	-	-	-	0	0.47
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	224.24	40.89	324.24	589.37	2.46	2.2	2.14	6.81	596.17
Mean				196.46				2.27	99.36
Net efficiency	1	0.8	0.6	0.8	0.8	0.8	0.93	0.84	0.82
Efficiency adjusted total	224.24	51.11	540.4	815.75	3.07	2.75	2.3	8.12	823.87
Efficiency adjusted Mean				271.92				2.71	137.31
Efficiency adjusted SE				143.24				0.2233	87.906
Efficiency Adjusted variance				61556				0.1497	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
21
Depth:
12
#Species:
58
Day:
24
Month:
1
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in January 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	0.34	0.67	0.56	1.57	19.29	3.46	14.55	37.3	38.87
Fundulus confluentus	-	0.15	-	0.15	-	3.67	1.69	5.36	5.51
Poecilia latipinna	3.59	0.19	-	3.78	0.83	-	-	0.83	4.61
Gambusia holbrooki	0.13	0.55	-	0.68	-	-	0.54	0.54	1.22
Lepomis punctatus	2.91	-	-	2.91	-	-	-	0	2.91
Adinia xenica	-	-	-	0	-	-	0.39	0.39	0.39
Lucania parva	0.38	0.47	0.46	1.31	-	-	-	0	1.31
Microgobius gulosus	-	-	0.71	0.71	-	-	-	0	0.71
Lucania goodeii	0.26	-	0.28	0.54	-	-	-	0	0.54
Noturus gyrinus	0.36	-	-	0.36	-	-	-	0	0.36
Menidia peninsulae	0.14	-	-	0.14	-	-	-	0	0.14
Lepomis spp.	-	-	0.08	0.08	-	-	-	0	0.08
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	8.11	2.03	2.09	12.23	20.12	7.12	17.17	44.41	56.64
Mean				4.08				14.8	9.44
Net efficiency	0.8	1	0.9	0.9	0.9	1	0.7	0.87	0.88
Efficiency adjusted total	10.14	2.03	2.32	14.49	22.36	7.12	24.53	54.01	68.5
Efficiency adjusted Mean				4.83				18	11.42
Efficiency adjusted SE				2.6563				5.4776	4.0111
Efficiency Adjusted variance				21.168				90.012	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
20
#Species:
58
Day:
16
Month:
1
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in January 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus confluentus	-	1.59	-	1.59	2.05	5.49	13.85	21.39	22.98
Cyprinodon variegatus	0.34	-	1	1.34	0.25	1.18	8.01	9.44	10.78
Gambusia holbrooki	4.13	4.49	2.04	10.66	0.55	2.86	3.35	6.76	17.41
Lucania parva	9.88	5.4	1.33	16.61	0.23	2.14	1.22	3.59	20.2
Lepomis punctatus	41.49	0.46	-	41.95	-	-	-	0	41.95
Poecilia latipinna	-	10.63	-	10.63	0.39	-	3.12	3.51	14.14
Jordanella floridae	-	4.45	-	4.45	0.56	0.7	0.95	2.2	6.65
Lucania goodeii	1.42	0.89	-	2.31	-	-	-	0	2.31
Lepomis marginatus	-	2.18	-	2.18	-	-	-	0	2.18
Fundulus chrysotus	0.19	1.67	-	1.86	-	-	-	0	1.86
Microgobius gulosus	1.56	-	-	1.56	-	-	-	0	1.56
Menidia peninsulae	1.44	-	-	1.44	-	-	-	0	1.44
Heterandria formosa	-	0.58	-	0.58	0.05	-	-	0.05	0.63
Lepomis spp.	-	0.1	-	0.1	-	-	-	0	0.1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	60.45	32.44	4.37	97.26	4.07	12.36	30.5	46.94	144.2
Mean				32.42				15.64	24.03
Net efficiency	0.9	0.9	0.9	0.9	0.7	1	0.9	0.87	0.88
Efficiency adjusted total	67.17	36.04	4.86	108.07	5.81	12.36	33.89	52.06	160.13
Efficiency adjusted Mean				36.02				17.35	26.69
Efficiency adjusted SE				17.987				8.4818	9.8247
Efficiency Adjusted variance				970.63				215.82	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
15
Depth:
17
#Species:
58
Day:
9
Month:
1
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in January 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Poecilia latipinna	39.07	61.95	38.96	139.98	0.95	0.33	-	1.28	141.26
Cichlasoma urophthalmus	51.32	24.82	29.84	105.97	-	-	-	0	105.97
Cyprinodon variegatus	12.36	35.69	31.63	79.69	9.42	3.75	4.09	17.26	96.95
Fundulus seminolis	1.93	26.69	-	28.62	-	-	-	0	28.62
Lepomis marginatus	10.58	3.53	6.64	20.75	-	-	-	0	20.75
Lucania parva	8.25	5.98	2.8	17.03	0.15	-	-	0.15	17.18
Fundulus confluentus	-	3.43	2.2	5.63	2.18	3.95	1.75	7.88	13.51
Gambusia holbrooki	3.41	7.99	2.09	13.48	0.28	0.65	0.44	1.37	14.86
Lepomis punctatus	13.54	0.71	-	14.25	-	-	-	0	14.25
Cichlasoma urophthalmus (>6.5 cm)	-	-	12.12	12.12	-	-	-	0	12.12
Lucania goodeii	4.44	1.7	1.61	7.75	0.06	-	-	0.06	7.81
Jordanella floridae	-	0.78	-	0.78	1.05	1.5	0.97	3.53	4.31
Fundulus chrysotus	1.57	-	1.79	3.36	-	1.33	-	1.33	4.69
Lophogobius cyprinoides	4.78	-	-	4.78	-	-	-	0	4.78
Microgobius gulosus	1.37	1.06	-	2.43	-	-	-	0	2.43
Tilapia mariae	-	0.49	-	0.49	-	-	-	0	0.49
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	152.61	174.81	129.69	457.11	14.1	11.51	7.25	32.86	489.96
Mean				152.37				10.95	81.66
Net efficiency	0.9	1	0.8	0.9	1	0.7	0.9	0.87	0.88
Efficiency adjusted total	169.57	174.81	162.11	506.49	14.1	16.44	8.06	38.6	545.09
Efficiency adjusted Mean				168.83				12.87	90.85
Efficiency adjusted SE				3.6848				2.4965	34.931
Efficiency Adjusted variance				40.733				18.697	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
21
Salin:
1
Depth:
21
#Species:
58
Day:
6
Month:
1
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in February 1997

Species	NET 7	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus grandis (>6.5 cm)	149.01	50.87	147.21	347.09	-	-	-	0	347.09
Fundulus grandis	-	66.88	175.07	241.95	-	-	-	0	241.95
Fundulus similis	-	-	100.65	100.65	-	-	-	0	100.65
Fundulus similis (>6.5 cm)	9.74	-	82.47	92.21	-	-	-	0	92.21
Floridichthys carpio	14.17	31.98	38.8	84.95	0.17	0.25	0.42	0.84	85.8
Opsanus beta	41.47	-	-	41.47	-	-	-	0	41.47
Cyprinodon variegatus	-	3.07	9.72	12.79	3.1	3.17	0.35	6.62	19.41
Gerridae spp.	16.1	-	-	16.1	-	-	-	0	16.1
Microgobius gulosus	0.3	0.78	1.15	2.23	0.4	-	0.42	0.82	3.05
Lucania parva	1.03	-	-	1.03	0.07	-	-	0.07	1.1
Fundulus confluentus	-	-	-	0	-	0.31	-	0.31	0.31
Menidia peninsulae	0.62	-	-	0.62	0.11	-	-	0.11	0.73
Poecilia latipinna	-	-	1.06	1.06	-	-	-	0	1.06
Adinia xenica	-	-	-	0	-	0.23	-	0.23	0.23
LARVAE	-	-	-	0	-	-	0.01	0.01	0.01
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	232.44	153.58	556.13	942.16	3.85	3.96	1.2	9.01	951.17
Mean				314.05				3	158.53
Net efficiency	0.8	0.8	0.87	0.82	1	1	0.93	0.98	0.9
Efficiency adjusted total	290.55	191.97	639.23	1121.8	3.85	3.96	1.29	9.1	1130.9
Efficiency adjusted Mean				373.92				3.03	188.47
Efficiency adjusted SE				135.67				0.8722	102.76
Efficiency Adjusted variance				55223				2.2825	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
24
Depth:
6
#Species:
56
Day:
3
Month:
3
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in February 1997

Species	NET 7	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus confluentus	6.43	5.03	8.28	19.73	12.54	21.13		33.67	53.41
Cyprinodon variegatus	10.07	21.15	2.17	33.38	16.54	7.59		24.13	57.51
Fundulus grandis (>6.5 cm)	49.35	8.92	48.88	107.15	-	-		0	107.15
Poecilia latipinna	1.24	19.98	-	21.22	2.04	4.99	Dry	7.03	28.26
Gambusia holbrooki	2.32	2.86	1.45	6.63	1.19	4.02		5.21	11.84
Adinia xenica	-	1.15	-	1.15	-	2.68		2.68	3.83
Fundulus grandis	6.17	15.36	-	21.53	-	-	Net	0	21.53
Menidia peninsulae	0.18	-	1.74	1.92	-	-		0	1.92
Fundulus chrysotus	-	-	0.8	0.8	-	-		0	0.8
Jordanella floridae	-	-	0.75	0.75	-	-		0	0.75
Lucania parva	-	-	0.66	0.66	-	-		0	0.66
LARVAE	0.02	-	-	0.02	-	-		0	0.02
Ameirus natalis	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-		0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Net	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-		0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Lucania goodeii	-	-	-	0	-	-		0	0
Microgobius gulosus	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-	Dry	0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	75.78	74.45	64.73	214.96	32.31	40.41		72.72	287.67
Mean				71.65				36.36	57.54
Net efficiency	1	1	0.83	0.94	1	1	0	1	0.97
Efficiency adjusted total	75.78	74.45	77.99	228.22	32.31	40.41		72.72	300.94
Efficiency adjusted Mean				76.07				36.36	60.19
Efficiency adjusted SE				1.0324				4.05	9.828
Efficiency Adjusted variance				3.1974				32.805	

5	#NETS
3	#DEEP
2	#FLATS
Temp:	
25	
Salin:	
3	
Depth:	
7	
#Species:	
56	
Day:	
27	
Month:	
2	
Year:	
1997	

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in February 1997

Species	NET 7	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus grandis (>6.5 cm)	-	189.95	-	189.95	-	-	-	0	189.95
Poecilia latipinna	37.67	99.95	14.02	151.65	-	0.5	-	0.5	152.15
Fundulus confluentus	10.82	47.29	10.85	68.96	1.04	6.48	1.83	9.35	78.31
Gambusia holbrooki	72.06	8.47	22.07	102.6	-	0.4	0.76	1.16	103.76
Cyprinodon variegatus	5.9	7.31	14.58	27.79	-	3.6	1.65	5.25	33.04
Jordanella floridae	18.26	12.95	1.23	32.43	-	-	-	0	32.43
Lepomis punctatus	25	4.07	-	29.06	-	-	-	0	29.06
Lucania parva	8.48	4.48	1.69	14.65	-	-	0.14	0.14	14.79
Fundulus chrysotus	0.42	2.36	0.75	3.53	-	-	-	0	3.53
Heterandria formosa	1.48	1.19	0.21	2.88	-	-	0.06	0.06	2.94
Lucania goodeii	0.78	0.27	0.23	1.28	-	-	-	0	1.28
Lepomis marginatus	-	0.82	-	0.82	-	-	-	0	0.82
Menidia peninsulae	0.5	-	0.31	0.81	-	-	-	0	0.81
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	181.38	379.1	65.95	626.42	1.04	10.98	4.44	16.46	642.88
Mean				208.81				5.49	107.15
Net efficiency	0.7	1	1	0.9	0.9	1	0.8	0.9	0.9
Efficiency adjusted total	259.11	379.1	65.95	704.16	1.16	10.98	5.55	17.69	721.85
Efficiency adjusted Mean				234.72				5.9	120.31
Efficiency adjusted SE				91.217				2.8401	65.45
Efficiency Adjusted variance				24962				24.198	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
5
Depth:
8
#Species:
56
Day:
24
Month:
2
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in February 1997

Species	NET 7	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Poecilia latipinna	65.32	94.77	78.03	238.12	-	-	Dry	0	238.12
Cyprinodon variegatus	45.27	28.73	24.5	98.5	0.74	-		0.74	99.23
Gambusia holbrooki	5.45	25.7	8.6	39.75	-	-		0	39.75
Cichlasoma urophthalmus	8.21	2.38	12.19	22.77	-	-		0	22.77
Lepomis punctatus	9.26	2.12	9.26	20.64	-	-		0	20.64
Fundulus confluentus	3.11	12.15	1.45	16.71	0.28	0.72		1	17.71
Lepomis marginatus	3.28	6.53	7.78	17.59	-	-		0	17.59
Fundulus chrysotus	-	1.73	2.91	4.64	-	0.95		0.95	5.59
Jordanella floridae	1.04	3.18	-	4.22	-	-		0	4.22
Lucania goodeii	1.03	0.72	0.94	2.69	-	-		0	2.69
Lucania parva	1.36	-	0.47	1.83	-	-		0	1.83
Heterandria formosa	0.25	-	0.46	0.71	0.05	0.03		0.08	0.79
Adinia xenica	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-		0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus grandis	-	-	-	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Net	0	0
Lepomis micolophus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Menidia peninsulae	-	-	-	0	-	-		0	0
Microgobius gulosus	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-	Dry	0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	143.58	178	146.6	468.18	1.07	1.7		2.76	470.95
Mean				156.06				1.39	94.19
Net efficiency	0.9	0.7	1	0.87	1	0.9	0	0.95	0.9
Efficiency adjusted total	159.53	254.29	146.6	560.42	1.07	1.89		2.96	563.38
Efficiency adjusted Mean				186.81				1.48	112.68
Efficiency adjusted SE				33.947				0.41	49.056
Efficiency Adjusted variance				3457.3				0.3362	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
24
Salin:
1
Depth:
6
#Species:
56
Day:
20
Month:
2
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in March 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	0.78	1	-	1.78	24.69	11.41	1.07	37.17	38.95
Cyprinodon variegatus	0.15	0.04	0.07	0.26	8.61	9.7	0.07	18.39	18.65
Fundulus grandis	-	-	-	0	11.78	-	-	11.78	11.78
Gerridae spp.	-	-	4.25	4.25	8.49	-	-	8.49	12.74
Lucania parva	1.61	0.23	1.23	3.07	0.89	0.41	0.38	1.68	4.75
Microgobius gulosus	1.27	1.4	2.4	5.07	-	-	-	0	5.07
Strongylura notata	-	-	-	0	-	-	0.7	0.7	0.7
Menidia peninsulae	-	-	-	0	0.23	-	-	0.23	0.23
Syngnathus louisianae	-	-	0.3	0.3	-	-	-	0	0.3
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	3.81	2.67	8.25	14.73	54.69	21.52	2.22	78.43	93.17
Mean				4.91				26.14	15.53
Net efficiency	0.6	0.85	0.87	0.77	0.9	0.94	1	0.95	0.86
Efficiency adjusted total	6.35	3.14	9.48	18.97	60.77	22.89	2.22	85.88	104.85
Efficiency adjusted Mean				6.32				28.63	17.47
Efficiency adjusted SE				1.8303				17.144	9.1827
Efficiency Adjusted variance				10.049				881.71	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
32
Depth:
16
#Species:
56
Day:
1
Month:
4
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in March 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	0.23	0.42	0.65	1.99	2.31	6.81	11.12	11.77
Fundulus confluentus	-	-	-	0	0.93	0.49	5.98	7.4	7.4
Gambusia holbrooki	0.23	-	-	0.23	-	0.25	5.07	5.32	5.55
Poecilia latipinna	2.81	-	-	2.81	-	-	0.36	0.36	3.17
Lucania parva	0.16	0.51	1.56	2.23	-	0.16	-	0.16	2.39
Microgobius gulosus	0.65	-	-	0.65	-	-	-	0	0.65
Jordanella floridae	-	0.47	-	0.47	-	-	-	0	0.47
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	3.85	1.21	1.98	7.04	2.93	3.21	18.22	24.35	31.4
Mean				2.35				8.12	5.23
Net efficiency	0.4	0.9	1	0.77	0.8	0.95	0.6	0.78	0.78
Efficiency adjusted total	9.62	1.34	1.98	12.94	3.66	3.38	30.37	37.41	50.35
Efficiency adjusted Mean				4.31				12.47	8.39
Efficiency adjusted SE				2.6598				8.9504	4.5567
Efficiency Adjusted variance				21.223				240.33	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
20
Depth:
16
#Species:
56
Day:
26
Month:
3
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in March 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus confluentus	5.47	4.85	1.91	12.22	2.99	3.41	10.49	16.89	29.11
Cyprinodon variegatus	0.75	-	0.02	0.77	0.57	8.25	7.37	16.19	16.96
Gambusia holbrooki	6.94	5.63	1.27	13.85	0.6	2.88	2.09	5.57	19.42
Poecilia latipinna	8.03	16.51	-	24.55	-	3	0.27	3.27	27.82
Jordanella floridae	18.18	17.81	1.2	37.2	-	-	-	0	37.2
Lucania parva	7.97	6.13	0.56	14.66	0.32	1.87	0.7	2.89	17.55
Heterandria formosa	1.53	2.18	0.36	4.07	0.15	-	0.07	0.22	4.29
Fundulus chrysotus	-	1.84	-	1.84	-	-	-	0	1.84
Lucania goodei	0.11	-	0.18	0.29	-	-	-	0	0.29
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus giriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	48.98	54.96	5.51	109.44	4.63	19.42	20.99	45.04	154.48
Mean				36.48				15.01	25.75
Net efficiency	0.6	1	0.7	0.77	0.5	1	1	0.83	0.8
Efficiency adjusted total	81.63	54.96	7.87	144.46	9.26	19.42	20.99	49.67	194.13
Efficiency adjusted Mean				48.15				16.56	32.35
Efficiency adjusted SE				21.563				3.6764	12.067
Efficiency Adjusted variance				1394.9				40.547	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
19
Depth:
16
#Species:
56
Day:
22
Month:
3
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in March 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	-	-	189.41	189.41	-	-	-	0	189.41
Poecilia latipinna	59.95	45.5	57.87	163.33	0.38	-	-	0.38	163.71
Gambusia holbrooki	29.44	46.87	6.26	82.57	1.09	-	-	1.09	83.66
Fundulus confluentus	21.92	23.94	4.18	50.05	3.35	-	-	3.35	53.39
Cichlasoma urophthalmus	13.43	-	20.84	34.27	-	-	-	0	34.27
Cyprinodon variegatus	4.97	2.5	3.82	11.29	4.57	2.36	4.12	11.05	22.34
Jordanella floridae	3.2	4.37	2.6	10.17	0.41	0.21	-	0.62	10.79
Heterandria formosa	1.76	1.65	1.92	5.34	0.09	0.1	-	0.19	5.53
Fundulus chrysotus	1.23	1.82	1.57	4.62	-	-	0.17	0.17	4.79
Lucania parva	1.02	0.39	2.22	3.63	-	-	-	0	3.63
Lucania goodeii	-	0.51	1.23	1.74	-	-	-	0	1.74
Lepomis punctatus	0.54	-	1.14	1.68	-	-	-	0	1.68
Lepomis marginatus	-	1.09	-	1.09	-	-	-	0	1.09
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	137.47	128.64	293.06	559.18	9.89	2.67	4.29	16.85	576.03
Mean				186.39				5.62	96
Net efficiency	0.9	0.8	1	0.9	0.8	0.6	0.9	0.77	0.83
Efficiency adjusted total	152.74	160.8	293.06	606.6	12.36	4.45	4.77	21.58	628.18
Efficiency adjusted Mean				202.2				7.19	104.7
Efficiency adjusted SE				45.49				2.585	48.131
Efficiency Adjusted variance				6207.9				20.046	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
4
Depth:
8
#Species:
56
Day:
19
Month:
3
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in April 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	0.82	0.05	6.37	7.25	4.22	2.02	6.62	12.86	20.11
Gerridae spp.	-	-	1.64	1.64	-	9.48	4.41	13.89	15.53
Floridichthys carpio	0.19	0.94	2.03	3.16	1.93	2.52	1.54	5.99	9.14
Lucania parva	3.59	4.26	1.01	8.86	1.15	0.5	0.32	1.97	10.83
Opsanus beta	10.96	-	-	10.96	-	-	-	0	10.96
Microgobius gulosus	0.19	0.59	0.91	1.69	-	1.19	-	1.19	2.88
Gambusia holbrooki	-	-	0.68	0.68	-	-	-	0	0.68
Poecilia latipinna	-	0.55	-	0.55	0.03	-	-	0.03	0.58
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	15.75	6.39	12.64	34.78	7.33	15.71	12.89	35.92	70.71
Mean				11.59				11.98	11.79
Net efficiency	0.7	0.8	0.87	0.79	0.8	0.9	0.8	0.83	0.81
Efficiency adjusted total	22.5	7.99	14.53	45.02	9.16	17.46	16.11	42.73	87.75
Efficiency adjusted Mean				15.01				14.24	14.63
Efficiency adjusted SE				4.1955				2.5714	2.2072
Efficiency Adjusted variance				52.805				19.836	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
28
Salin:
35
Depth:
22
#Species:
56
Day:
30
Month:
4
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in April 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	3.74	3.12	2.89	9.75	0.99	0.96	5.13	7.08	16.84
Fundulus confluentus	3.67	1.7	4.16	9.53	2.56	0.93	0.54	4.03	13.57
Fundulus grandis (>6.5 cm)	16.66	-	-	16.66	-	-	-	0	16.66
Lucania parva	2.22	2.05	1.56	5.82	0.67	-	0.11	0.78	6.6
Menidia peninsulae	0.17	0.61	0.41	1.19	-	-	-	0	1.19
Gambusia holbrooki	0.47	0.57	0.11	1.15	-	-	-	0	1.15
Poecilia latipinna	1.14	-	-	1.14	-	-	-	0	1.14
Microgobius gulosus	0.34	-	-	0.34	-	-	-	0	0.34
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	28.4	8.05	9.14	45.59	4.22	1.89	5.78	11.9	57.48
Mean				15.2				3.96	9.58
Net efficiency	0.72	0.7	0.7	0.71	0.8	0.8	0.8	0.8	0.75
Efficiency adjusted total	39.44	11.5	13.06	64	5.27	2.36	7.22	14.85	78.85
Efficiency adjusted Mean				21.33				4.95	13.14
Efficiency adjusted SE				9.0645				1.4121	5.5002
Efficiency Adjusted variance				246.5				5.9817	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
26
Depth:
19
#Species:
56
Day:
24
Month:
4
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in April 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Gambusia holbrooki	3.2	21.1	3.78	28.08	1.68	1.2	6.73	9.6	37.69
Cyprinodon variegatus	5.8	0.76	5.22	11.79	1.73	6.48	3.42	11.63	23.42
Fundulus confluentus	2.21	3.74	5.21	11.16	2.94	2.47	4.68	10.09	21.25
Lucania parva	20.32	5.98	4.71	31.01	1.42	0.25	1.24	2.91	33.92
Poecilia latipinna	11.75	9.66	3.09	24.5	1.53	-	0.03	1.56	26.06
Jordanella floridae	0.6	10.85	0.75	12.2	0.36	-	-	0.36	12.57
Fundulus grandis	-	-	-	0	0.36	0.15	-	0.51	0.51
Heterandria formosa	0.43	0.46	0.05	0.94	-	-	-	0	0.94
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	44.32	52.55	22.81	119.68	10.02	10.55	16.09	36.67	156.35
Mean				39.89				12.22	26.06
Net efficiency	0.6	1	0.8	0.8	0.6	0.9	0.7	0.73	0.77
Efficiency adjusted total	73.87	52.55	28.51	154.93	16.7	11.72	22.99	51.41	206.34
Efficiency adjusted Mean				51.64				17.14	34.39
Efficiency adjusted SE				13.102				3.2607	9.7977
Efficiency Adjusted variance				515				31.896	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
27
Depth:
17
#Species:
56
Day:
21
Month:
4
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in April 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	394.08	119.26	143.76	657.1	-	-	-	0	657.1
Gambusia holbrooki	31.56	70.29	13.4	115.25	1.1	1.03	0.06	2.2	117.45
Poecilia latipinna	4.61	29.7	23.18	57.5	0.38	-	3.12	3.5	61
Fundulus confluentus	1.01	11.28	-	12.29	13.77	3.31	3.42	20.5	32.79
Cyprinodon variegatus	1.37	7.1	2.15	10.62	6.2	5.95	5.1	17.25	27.87
Cichlasoma urophthalmus	17.05	9.18	4.42	30.65	-	-	-	0	30.65
Lucania parva	6.85	9.59	9.97	26.4	-	-	-	0	26.4
Jordanella floridae	0.84	1.84	0.32	2.99	4.61	0.24	0.86	5.71	8.7
Menidia peninsulae	-	2.04	3.74	5.78	-	-	-	0	5.78
Microgobius gulosus	1.37	1.87	1.17	4.41	-	-	-	0	4.41
Heterandria formosa	0.7	1.35	0.83	2.88	0.37	-	-	0.37	3.25
Lucania goodeii	0.44	0.56	1.46	2.46	-	-	-	0	2.46
Belonesox belizanus	-	-	-	0	-	-	0.86	0.86	0.86
Fundulus chrysotus	-	-	-	0	-	-	0.28	0.28	0.28
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	459.88	264.05	204.4	928.33	26.43	10.53	13.71	50.67	979
Mean				309.44				16.89	163.17
Net efficiency	0.7	0.9	0.8	0.8	1	0.7	0.7	0.8	0.8
Efficiency adjusted total	656.97	293.39	255.5	1205.9	26.43	15.04	19.59	61.06	1266.9
Efficiency adjusted Mean				401.95				20.35	211.15
Efficiency adjusted SE				127.98				3.3101	102.76
Efficiency Adjusted variance				49134				32.87	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
22
Depth:
10
#Species:
56
Day:
17
Month:
4
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in June 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	0.92	4.98	0.38	6.28	2.22	7.77	2.16	12.15	18.43
Cyprinodon variegatus	1.34	2.34	7	10.67	0.12	1.94	2.48	4.54	15.21
Lucania parva	8.88	4.03	5.15	18.06	0.34	0.55	0.65	1.54	19.6
Microgobius gulosus	3.44	2.08	3.27	8.79	1.57	1.19	-	2.76	11.55
Gerridae spp.	-	-	3.91	3.91	-	-	3.84	3.84	7.75
Large Gerridae spp.	9.47	-	-	9.47	-	-	-	0	9.47
Sphyraena barracuda	-	-	8.75	8.75	-	-	-	0	8.75
Poecilia latipinna	1.92	1.34	1.74	5	-	-	0.85	0.85	5.85
Menidia peninsulae	3.44	-	-	3.44	-	-	-	0	3.44
Opsanus beta	2.05	-	-	2.05	-	-	-	0	2.05
Strongylura notata	-	-	1.98	1.98	-	-	-	0	1.98
Gambusia holbrooki	-	-	0.33	0.33	-	-	-	0	0.33
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	31.46	14.76	32.51	78.73	4.26	11.45	9.98	25.68	104.41
Mean				26.24				8.56	17.4
Net efficiency	1	0.8	0.87	0.89	1	1	0.7	0.9	0.9
Efficiency adjusted total	31.46	18.45	37.37	87.28	4.26	11.45	14.26	29.97	117.25
Efficiency adjusted Mean				29.09				9.99	19.54
Efficiency adjusted SE				5.5885				2.9776	5.1251
Efficiency Adjusted variance				93.692				26.599	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
30	
Salin:	
2	
Depth:	
16	
#Species:	
56	
Day:	
25	
Month:	
6	
Year:	
1997	

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in June 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	1.07	2.18	4.94	8.19	10.38	5.65	5.3	21.33	29.52
Lucania parva	1.44	2.92	2.88	7.24	0.75	1.5	2.07	4.32	11.56
Fundulus confluentus	1.45	1.97	-	3.42	-	-	1.38	1.38	4.8
Belonesox belizanus	-	5.83	-	5.83	-	-	-	0	5.83
Lepomis punctatus	2.62	-	-	2.62	-	-	-	0	2.62
Gambusia holbrooki	0.49	0.67	0.36	1.52	-	0.13	-	0.13	1.65
Poecilia latipinna	-	-	0.07	0.07	-	-	-	0	0.07
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	7.07	13.57	8.25	28.89	11.13	7.28	8.74	27.16	56.05
Mean				9.63				9.05	9.34
Net efficiency	0.8	0.8	1	0.87	1	1	0.6	0.87	0.87
Efficiency adjusted total	8.84	16.96	8.25	34.05	11.13	7.28	14.57	32.98	67.03
Efficiency adjusted Mean				11.35				10.99	11.17
Efficiency adjusted SE				2.8102				2.1056	1.5724
Efficiency Adjusted variance				23.691				13.3	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
32
Salin:
3
Depth:
30
#Species:
56
Day:
20
Month:
6
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in June 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	11.93	18.18	51.66	81.77	14.18	13.5	41.76	69.44	151.21
Lucania parva	13.27	16.43	11.72	41.42	6.46	3.01	13.38	22.85	64.27
Cichlasoma urophthalmus (>6.5 cm)	-	22.47	-	22.47	-	-	-	0	22.47
Microgobius gulosus	-	-	-	0	0.64	0.7	1	2.34	2.34
Poecilia latipinna	2.1	1.55	0.6	4.24	1.21	-	0.17	1.39	5.63
Fundulus confluentus	0.59	-	-	0.59	1.42	-	-	1.42	2.01
Fundulus grandis	3.19	0.85	-	4.04	-	-	-	0	4.04
Gambusia holbrooki	0.35	-	-	0.35	-	-	0.18	0.18	0.53
Lucania goodeii	-	-	0.16	0.16	-	-	-	0	0.16
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	31.43	59.48	64.14	155.05	23.91	17.21	56.5	97.62	252.66
Mean				51.68				32.54	42.11
Net efficiency	0.8	0.6	0.9	0.77	1	0.7	0.7	0.8	0.78
Efficiency adjusted total	39.29	99.13	71.27	209.69	23.91	24.59	80.71	129.21	338.9
Efficiency adjusted Mean				69.9				43.07	56.48
Efficiency adjusted SE				17.288				18.821	12.908
Efficiency Adjusted variance				896.62				1062.7	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
33
Salin:
1
Depth:
39
#Species:
56
Day:
17
Month:
6
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in June 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	-		158.48	158.48	-	-	-	0	158.48
Microgobius gulosus	7.97		3.26	11.22	22.32	0.43	6.87	29.62	40.84
Lucania parva	3.98	Sampled	6.18	10.16	2.62	2.56	0.64	5.82	15.98
Cichlasoma urophthalmus	-		5.55	5.55	1.16	1.73	-	2.89	8.44
Cyprinodon variegatus	-		-	0	2.01	1.91	4.55	8.47	8.47
Lepomis marginatus	-		-	0	-	7.2	-	7.2	7.2
Poecilia latipinna	0.45	Not	0.44	0.89	4.96	1.02	0.05	6.03	6.92
Menidia peninsulae	0.66		3.96	4.62	1.32	-	-	1.32	5.94
Fundulus confluentus	-		-	0	-	2.61	-	2.61	2.61
Belonesox belizanus	0.36		0.33	0.69	-	0.29	-	0.29	0.98
Enneacanthus gloriosus	-		0.87	0.87	-	-	-	0	0.87
Lucania goodeii	-		0.68	0.68	-	-	-	0	0.68
Jordanella floridae	-		-	0	-	-	0.53	0.53	0.53
Gambusia holbrooki	0.04		0.06	0.11	-	-	0.23	0.23	0.34
Adinia xenica	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Anchoa mitchili	-		-	0	-	-	-	0	0
Cichlasoma bimaculatum	-		-	0	-	-	-	0	0
Clarias batrachus	-		-	0	-	-	-	0	0
Cynoscion nebulosus	-		-	0	-	-	-	0	0
Elassoma evergladei	-		-	0	-	-	-	0	0
Elops saurus	-		-	0	-	-	-	0	0
Erimyzon sucetta	-		-	0	-	-	-	0	0
Floridichthys carpio	-		-	0	-	-	-	0	0
Fundulus chrysotus	-		-	0	-	-	-	0	0
Fundulus grandis	-	Net	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-		-	0	-	-	-	0	0
Fundulus seminolis	-		-	0	-	-	-	0	0
Fundulus similis	-		-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-		-	0	-	-	-	0	0
Gerridae spp.	-		-	0	-	-	-	0	0
Gobiosoma bosci	-		-	0	-	-	-	0	0
Gobiosoma robustum	-		-	0	-	-	-	0	0
Heterandria formosa	-		-	0	-	-	-	0	0
Large Gerridae spp.	-		-	0	-	-	-	0	0
LARVAE	-		-	0	-	-	-	0	0
Lepomis gulosus	-		-	0	-	-	-	0	0
Lepomis macrochirus	-	Not	-	0	-	-	-	0	0
Lepomis micolophus	-	Net	-	0	-	-	-	0	0
Lepomis punctatus	-		-	0	-	-	-	0	0
Lepomis spp.	-		-	0	-	-	-	0	0
Lophogobius cyprinoides	-		-	0	-	-	-	0	0
Micropterus salmoides	-		-	0	-	-	-	0	0
Mugil cephalus	-		-	0	-	-	-	0	0
Notropis sp.	-		-	0	-	-	-	0	0
Noturus gyrinus	-	Sampled	-	0	-	-	-	0	0
Opsanus beta	-		-	0	-	-	-	0	0
Oreochromis aureus	-		-	0	-	-	-	0	0
Pogonias chromis	-		-	0	-	-	-	0	0
Scianops ocellatus	-		-	0	-	-	-	0	0
Sphyraena barracuda	-		-	0	-	-	-	0	0
Strongylura notata	-		-	0	-	-	-	0	0
Syngnathus louisianae	-		-	0	-	-	-	0	0
Tilapia mariae	-		-	0	-	-	-	0	0
Trinectes maculatus	-		-	0	-	-	-	0	0
Total	13.46		179.81	193.27	34.39	17.75	12.87	65	258.28
Mean				96.64				21.67	51.66
Net efficiency	0.4	0	0.7	0.55	1	1	0.9	0.97	0.8
Efficiency adjusted total	33.65		256.87	290.52	34.39	17.75	14.3	66.44	356.96
Efficiency adjusted Mean				145.26				22.15	71.39
Efficiency adjusted SE				111.61				6.2022	46.547
Efficiency Adjusted variance				24914				115.4	

5	#NETS
2	#DEEP
3	#FLATS
Temp:	
30	
Salin:	
1	
Depth:	
60	
#Species:	
56	
Day:	
13	
Month:	
6	
Year:	
1997	

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in September 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	0.5	2.48	-	2.98	5.71	6.63	1.4	13.74	16.72
Lucania parva	4.14	5.52	3.17	12.83	1.37	2.39	1.69	5.45	18.28
Gerridae spp.	-	10.31	19.38	29.69	-	-	-	0	29.69
Cichlasoma urophthalmus	0.43	0.74	3.59	4.76	-	0.74	-	0.74	5.5
Microgobius gulosus	1.24	0.57	0.2	2.01	0.18	-	1.21	1.39	3.41
Cyprinodon variegatus	0.32	0.39	1.25	1.96	-	-	0.45	0.45	2.41
Poecilia latipinna	0.32	0.15	-	0.47	-	-	-	0	0.47
Gambusia holbrooki	-	0.19	0.25	0.44	-	-	-	0	0.44
Belonesox belizanus	-	-	0.38	0.38	-	-	-	0	0.38
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	6.95	20.36	28.22	55.53	7.26	9.76	4.75	21.77	77.3
Mean				18.51				7.26	12.88
Net efficiency	0.6	0.78	0.87	0.75	0.87	0.92	0.88	0.89	0.82
Efficiency adjusted total	11.58	26.1	32.44	70.12	8.34	10.61	5.4	24.35	94.47
Efficiency adjusted Mean				23.37				8.12	15.74
Efficiency adjusted SE				6.1742				1.5081	4.4404
Efficiency Adjusted variance				114.36				6.8235	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
3
Depth:
25
#Species:
56
Day:
8
Month:
10
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in September 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	0.31	1.08	0.39	1.78	8.61	0.88	27.97	37.46	39.24
Cichlasoma urophthalmus	7.88	19.12	4.34	31.34	3.42	0.51	-	3.93	35.27
Lucania parva	1.85	1.96	3.96	7.77	2.74	1.33	1.07	5.14	12.91
Floridichthys carpio	-	-	-	0	2.27	-	0.56	2.83	2.83
Fundulus confluentus	-	-	0.14	0.14	-	1.44	-	1.44	1.58
Poecilia latipinna	2.14	-	0.02	2.16	-	-	-	0	2.16
Gambusia holbrooki	0.15	0.22	0.45	0.82	-	-	-	0	0.82
Microgobius gulosus	0.59	-	-	0.59	-	-	-	0	0.59
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	12.92	22.38	9.3	44.6	17.04	4.16	29.6	50.79	95.4
Mean				14.87				16.93	15.9
Net efficiency	0.79	1	0.85	0.88	1	1	1	1	0.94
Efficiency adjusted total	16.35	22.38	10.94	49.67	17.04	4.16	29.6	50.8	100.47
Efficiency adjusted Mean				16.56				16.93	16.75
Efficiency adjusted SE				3.3041				7.3441	3.6024
Efficiency Adjusted variance				32.75				161.81	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
0
Depth:
27
#Species:
56
Day:
22
Month:
9
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in September 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	0.39	3.04	1.73	5.15	14.42	-	8.89	23.31	28.46
Lucania parva	5.78	3.18	4.9	13.86	11.71	2.51	4.7	18.92	32.78
Fundulus confluentus	0.2	1.27	-	1.47	3.1	-	0.93	4.04	5.51
Gerridae spp.	-	-	-	0	-	-	2.99	2.99	2.99
Cichlasoma urophthalmus	0.43	12.46	3.58	16.47	-	-	0.59	0.59	17.05
Cichlasoma urophthalmus (>6.5 cm)	11.65	-	-	11.65	-	-	-	0	11.65
Microgobius gulosus	-	-	-	0	-	1.27	-	1.27	1.27
Poecilia latipinna	0.17	-	-	0.17	-	-	0.59	0.59	0.76
Adinia xenica	-	-	-	0	-	-	0.49	0.49	0.49
Gambusia holbrooki	0.31	0.68	0.23	1.22	-	-	-	0	1.22
Menidia peninsulae	-	-	0.39	0.39	-	-	-	0	0.39
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	18.92	20.63	10.82	50.37	29.23	3.78	19.18	52.19	102.56
Mean				16.79				17.4	17.09
Net efficiency	0.8	0.92	0.87	0.86	0.8	1	0.82	0.87	0.87
Efficiency adjusted total	23.65	22.42	12.44	58.51	36.54	3.78	23.39	63.71	122.22
Efficiency adjusted Mean				19.5				21.24	20.37
Efficiency adjusted SE				3.5495				9.5181	4.5595
Efficiency Adjusted variance				37.796				271.78	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
31	
Salin:	
0	
Depth:	
39	
#Species:	
56	
Day:	
30	
Month:	
9	
Year:	
1997	

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in September 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	11.35	7.19	13.34	31.87	10.34	7.28	25.51	43.13	75.01
Poecilia latipinna	0.11	0.91	1.74	2.76	2.71	6.12	1.33	10.16	12.92
Lucania parva	4.14	4.49	0.47	9.1	0.29	0.59	0.83	1.71	10.81
Microgobius gulosus	2.43	1.22	0.21	3.86	1.72	1.12	1.53	4.37	8.23
Cyprinodon variegatus	-	0.14	0.05	0.19	1.77	1.77	1.95	5.49	5.68
Lophogobius cyprinoides	2.67	3.06	0.42	6.15	-	-	-	0	6.15
Belonesox belizanus	-	-	-	0	-	0.53	3.38	3.91	3.91
Fundulus confluentus	-	-	-	0	-	0.72	2.98	3.7	3.7
Floridichthys carpio	-	-	-	0	-	-	1.08	1.08	1.08
Gambusia holbrooki	-	-	0.05	0.05	-	-	-	0	0.05
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	20.71	17.01	16.27	53.99	16.83	18.13	38.59	73.55	127.54
Mean				18				24.52	21.26
Net efficiency	1	0.8	0.4	0.73	1	0.6	1	0.87	0.8
Efficiency adjusted total	20.71	21.26	40.67	82.64	16.83	30.22	38.59	85.64	168.28
Efficiency adjusted Mean				27.55				28.55	28.05
Efficiency adjusted SE				6.5636				6.337	4.0863
Efficiency Adjusted variance				129.24				120.47	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
1
Depth:
30
#Species:
56
Day:
17
Month:
9
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in November 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	0.07	2.72	2.86	5.65	4.95	22.63	1.32	28.9	34.56
Fundulus similis (>6.5 cm)	-	-	-	0	-	13.04	-	13.04	13.04
Cyprinodon variegatus	-	0.09	1.64	1.73	5.25	2.28	3.46	10.99	12.72
Strongylura notata	12.79	3.12	17.52	33.43	-	-	-	0	33.43
Lucania parva	1.31	2.58	1.96	5.84	0.79	0.89	2.4	4.08	9.92
Cichlasoma urophthalmus	-	-	1.03	1.03	-	1.77	1.45	3.22	4.24
Poecilia latipinna	0.86	-	2.66	3.52	1.93	-	-	1.93	5.45
Microgobius gulosus	1.38	2.14	1.97	5.48	0.47	0.45	0.12	1.04	6.52
Menidia peninsulae	-	-	-	0	-	-	0.29	0.29	0.29
Gambusia holbrooki	-	-	0.32	0.32	-	-	0.09	0.09	0.41
Gerridae spp.	-	-	-	0	-	-	0.09	0.09	0.09
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	16.4	10.65	29.95	57	13.39	41.05	9.22	63.66	120.66
Mean				19				21.22	20.11
Net efficiency	0.9	0.9	0.8	0.87	0.4	0.7	0.7	0.6	0.73
Efficiency adjusted total	18.22	11.83	37.44	67.49	33.47	58.64	13.17	105.28	172.77
Efficiency adjusted Mean				22.5				35.09	28.8
Efficiency adjusted SE				7.696				13.151	7.3736
Efficiency Adjusted variance				177.69				518.86	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
17
Depth:
19
#Species:
58
Day:
20
Month:
11
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in November 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	2.39	1.35	0.44	4.18	9.02	-		9.02	13.19
Lucania parva	1.96	2.2	1.34	5.5	3.89	0.76	Sampled	4.65	10.15
Cichlasoma urophthalmus	11.38	12.11	7.92	31.41	-	0.39		0.39	31.8
Poecilia latipinna	-	-	-	0	2.41	-	Not	2.41	2.41
Cichlasoma urophthalmus (>6.5 cm)	-	21.47	-	21.47	-	-		0	21.47
Gambusia holbrooki	4.1	1.89	0.57	6.56	0.25	0.1		0.35	6.91
Fundulus confluentus	-	-	-	0	-	0.49		0.49	0.49
Fundulus chrysotus	-	0.29	-	0.29	0.27	-		0.27	0.56
Belonesox belizanus	-	1.42	0.45	1.87	-	-		0	1.87
Tilapia mariae	-	0.65	-	0.65	-	-		0	0.65
Lepomis punctatus	-	-	0.58	0.58	-	-		0	0.58
Lucania goodeii	-	-	0.27	0.27	-	-		0	0.27
Adinia xenica	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-	Sampled	0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus grandis	-	-	-	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Ictalurus spp.	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepisosteus platyrhincus	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Menidia peninsulae	-	-	-	0	-	-		0	0
Microgobius gulosus	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-		0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Syngnathus scovelli	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	19.82	41.38	11.57	72.78	15.84	1.74		17.57	90.35
Mean				24.26				8.79	18.07
Net efficiency	0.9	0.9	0.85	0.88	1	1	0	1	0.93
Efficiency adjusted total	22.02	45.98	13.61	81.61	15.84	1.74		17.58	99.19
Efficiency adjusted Mean				27.2				8.79	19.84
Efficiency adjusted SE				9.6972				7.05	7.316
Efficiency Adjusted variance				282.1				99.405	

5	#NETS
3	#DEEP
2	#FLATS
Temp:	
25	
Salin:	
3	
Depth:	
22	
#Species:	
58	
Day:	
16	
Month:	
11	
Year:	
1997	

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in November 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	-	0.22	0.22	12.49	20.46	14.99	47.95	48.17
Cichlasoma urophthalmus	76.33	101.07	8.68	186.08	8.92	3.66	1.49	14.07	200.15
Cichlasoma urophthalmus (>6.5 cm)	190.42	38.45	-	228.87	-	-	-	0	228.87
Poecilia latipinna	1.35	-	-	1.35	24.36	-	-	24.36	25.71
Lucania parva	4.06	0.88	8.34	13.27	1.14	14.04	0.37	15.56	28.83
Oreochromis aureus	80.78	-	-	80.78	-	-	-	0	80.78
Lepomis punctatus	-	8.97	-	8.97	-	-	1.84	1.84	10.81
Fundulus confluentus	0.93	-	-	0.93	-	-	1.95	1.95	2.88
Belonesox belizanus	-	5.49	3.69	9.18	0.48	-	0.08	0.56	9.74
Gambusia holbrooki	1.66	0.41	3.02	5.09	-	-	1.09	1.09	6.18
Microgobius gulosus	0.41	-	-	0.41	-	0.45	-	0.45	0.86
Tilapia mariae	-	1.09	-	1.09	-	-	-	0	1.09
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	355.93	156.36	23.94	536.24	47.39	38.62	21.81	107.82	644.06
Mean				178.74				35.94	107.34
Net efficiency	0.7	1	1	0.9	0.9	0.9	1	0.93	0.92
Efficiency adjusted total	508.47	156.36	23.94	688.77	52.66	42.91	21.81	117.38	806.15
Efficiency adjusted Mean				229.59				39.13	134.36
Efficiency adjusted SE				144.58				9.1043	77.533
Efficiency Adjusted variance				62714				248.67	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
2
Depth:
22
#Species:
58
Day:
12
Month:
11
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in November 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	11.96	2.25	20.3	34.5	4.63	14.59	12.65	31.87	66.37
Cichlasoma urophthalmus (>6.5 cm)	-	-	15.55	15.55	-	11.95	-	11.95	27.5
Lucania parva	8.58	5.56	8.01	22.15	0.87	-	0.2	1.07	23.22
Lophogobius cyprinoides	3.93	7.61	1.1	12.64	-	-	-	0	12.64
Poecilia latipinna	0.22	0.11	0.24	0.57	5	2.4	0.04	7.44	8.01
Belonesox belizanus	-	-	-	0	0.05	-	5.35	5.4	5.4
Gambusia holbrooki	0.41	0.8	2.62	3.83	1.56	-	0.62	2.18	6.01
Cyprinodon variegatus	0.5	-	-	0.5	-	-	2.25	2.25	2.75
Microgobius gulosus	-	1.53	0.27	1.8	-	-	0.56	0.56	2.36
Tilapia mariae	0.16	0.24	0.29	0.69	-	-	-	0	0.69
Gobiosoma bosci	-	0.19	-	0.19	-	-	-	0	0.19
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	25.75	18.29	48.38	92.42	12.11	28.94	21.67	62.72	155.14
Mean				30.81				20.91	25.86
Net efficiency	0.7	0.6	0.7	0.67	1	0.8	0.9	0.9	0.78
Efficiency adjusted total	36.79	30.48	69.11	136.38	12.11	36.17	24.08	72.36	208.74
Efficiency adjusted Mean				45.46				24.12	34.79
Efficiency adjusted SE				11.964				6.9456	7.8133
Efficiency Adjusted variance				429.45				144.72	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
23
Salin:
0
Depth:
22
#Species:
58
Day:
8
Month:
11
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in December 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus grandis (>6.5 cm)	-	-	-	0	-	7.94		7.94	7.94
Fundulus grandis	-	-	5.78	5.78	4.41	-	Net	4.41	10.19
Lucania parva	2.55	2.47	1.5	6.52	0.47	1.11	Sampled	1.58	8.1
Floridichthys carpio	-	-	-	0	-	1.48		1.48	1.48
Microgobius gulosus	1.28	0.29	1.05	2.62	0.66	0.08		0.74	3.36
Cyprinodon variegatus	-	-	-	0	-	0.74		0.74	0.74
Gambusia holbrooki	-	0.36	0.2	0.56	0.14	-		0.14	0.7
Poecilia latipinna	0.76	0.28	-	1.04	-	-	Not	0	1.04
Cichlasoma urophthalmus	-	-	0.77	0.77	-	-		0	0.77
Strongylura notata	-	0.76	-	0.76	-	-		0	0.76
Adinia xenica	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-		0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Fundulus chrysotus	-	-	-	0	-	-		0	0
Fundulus confluentus	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Lucania goodeii	-	-	-	0	-	-		0	0
Menidia peninsulae	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-	Sampled	0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	4.59	4.16	9.3	18.05	5.68	11.35		17.03	35.08
Mean				6.02				8.52	7.02
Net efficiency	0.8	0.8	0.8	0.8	1	0.9	0	0.95	0.86
Efficiency adjusted total	5.74	5.2	11.62	22.56	5.68	12.61		18.29	40.85
Efficiency adjusted Mean				7.52				9.14	8.17
Efficiency adjusted SE				2.0559				3.465	1.6208
Efficiency Adjusted variance				12.68				24.013	

5	#NETS
3	#DEEP
2	#FLATS
Temp:	
25	
Salin:	
14	
Depth:	
15	
#Species:	
56	
Day:	
22	
Month:	
12	
Year:	
1997	

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in December 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	45.84	2.98	132.66	181.48	16.61	25.23	15.79	57.63	239.11
Poecilia latipinna	21.69	43.66	61.97	127.31	-	-	-	0	127.31
Fundulus grandis (>6.5 cm)	52.44	6.51	-	58.95	-	-	-	0	58.95
Cichlasoma urophthalmus	10.32	15.37	14.88	40.57	1.62	-	-	1.62	42.19
Fundulus confluentus	0.49	18.02	12.54	31.06	-	2.3	0.76	3.06	34.12
Fundulus grandis	-	19.71	4.48	24.19	-	1.02	-	1.02	25.2
Adinia xenica	1.95	1.78	5.19	8.92	-	-	-	0	8.92
Lucania parva	-	-	-	0	0.39	0.7	-	1.09	1.09
Gambusia holbrooki	0.68	0.55	-	1.23	-	-	-	0	1.23
Lucania goodeii	-	-	0.21	0.21	-	-	-	0	0.21
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	133.41	108.59	231.92	473.91	18.62	29.25	16.55	64.41	538.33
Mean				157.97				21.47	89.72
Net efficiency	0.9	0.7	1	0.87	1	0.9	1	0.97	0.92
Efficiency adjusted total	148.23	155.13	231.92	535.28	18.62	32.5	16.55	67.67	602.95
Efficiency adjusted Mean				178.43				22.56	100.49
Efficiency adjusted SE				26.821				5.0074	36.928
Efficiency Adjusted variance				2158.1				75.224	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
19
Salin:
0
Depth:
18
#Species:
56
Day:
20
Month:
12
Year:
1997

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in December 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-		-	0	7.39	23.36	51.46	82.21	82.21
Cichlasoma urophthalmus	2.95		6.2	9.15	6.94	7.7	13.75	28.39	37.54
Poecilia latipinna	-	Not	-	0	-	-	18.1	18.1	18.1
Fundulus confluentus	0.18		-	0.18	-	7.95	-	7.95	8.13
Lucania parva	7.11	Sampled	4.47	11.58	2.02	2.97	-	4.99	16.57
Belonesox belizanus	2.69		-	2.69	-	3.07	-	3.07	5.76
Lepomis punctatus	9.05		-	9.05	-	-	-	0	9.05
Microgobius gulosus	0.61		-	0.61	-	-	-	0	0.61
Lucania goodeii	-		0.11	0.11	-	0.09	-	0.09	0.2
Adinia xenica	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Anchoa mitchili	-		-	0	-	-	-	0	0
Cichlasoma bimaculatum	-		-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-		-	0	-	-	-	0	0
Clarias batrachus	-		-	0	-	-	-	0	0
Cynoscion nebulosus	-		-	0	-	-	-	0	0
Elassoma evergladei	-		-	0	-	-	-	0	0
Elops saurus	-		-	0	-	-	-	0	0
Enneacanthus glriosus	-		-	0	-	-	-	0	0
Erimyzon sucetta	-		-	0	-	-	-	0	0
Floridichthys carpio	-		-	0	-	-	-	0	0
Fundulus chrysotus	-		-	0	-	-	-	0	0
Fundulus grandis	-	Net	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-		-	0	-	-	-	0	0
Fundulus seminolis	-		-	0	-	-	-	0	0
Fundulus similis	-		-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-		-	0	-	-	-	0	0
Gambusia holbrooki	-		-	0	-	-	-	0	0
Gerridae spp.	-		-	0	-	-	-	0	0
Gobiosoma bosci	-		-	0	-	-	-	0	0
Gobiosoma robustum	-		-	0	-	-	-	0	0
Heterandria formosa	-		-	0	-	-	-	0	0
Jordanella floridae	-		-	0	-	-	-	0	0
Large Gerridae spp.	-		-	0	-	-	-	0	0
LARVAE	-		-	0	-	-	-	0	0
Lepomis gulosus	-		-	0	-	-	-	0	0
Lepomis macrochirus	-	Not	-	0	-	-	-	0	0
Lepomis marginatus	-		-	0	-	-	-	0	0
Lepomis micolophus	-	Net	-	0	-	-	-	0	0
Lepomis spp.	-		-	0	-	-	-	0	0
Lophogobius cyprinoides	-		-	0	-	-	-	0	0
Menidia peninsulae	-		-	0	-	-	-	0	0
Micropterus salmoides	-		-	0	-	-	-	0	0
Mugil cephalus	-		-	0	-	-	-	0	0
Notropis sp.	-		-	0	-	-	-	0	0
Noturus gyrinus	-	Sampled	-	0	-	-	-	0	0
Opsanus beta	-		-	0	-	-	-	0	0
Oreochromis aureus	-		-	0	-	-	-	0	0
Pogonias chromis	-		-	0	-	-	-	0	0
Scianops ocellatus	-		-	0	-	-	-	0	0
Sphyraena barracuda	-		-	0	-	-	-	0	0
Strongylura notata	-		-	0	-	-	-	0	0
Syngnathus louisianae	-		-	0	-	-	-	0	0
Tilapia mariae	-		-	0	-	-	-	0	0
Trinectes maculatus	-		-	0	-	-	-	0	0
Total	22.59		10.78	33.37	16.35	45.14	83.31	144.81	178.17
Mean				16.68				48.27	35.63
Net efficiency	0.6	0	1	0.8	0.9	1	0.6	0.83	0.82
Efficiency adjusted total	37.65		10.78	48.43	18.17	45.14	138.85	202.16	250.59
Efficiency adjusted Mean				24.22				67.39	50.12
Efficiency adjusted SE				13.435				36.57	23.045
Efficiency Adjusted variance				361				4012.1	

5	#NETS
2	#DEEP
3	#FLATS
Temp:	
27	
Salin:	
1	
Depth:	
24	
#Species:	
56	
Day:	
13	
Month:	
12	
Year:	
1997	

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in December 1997

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus		7.66	55.41	63.07	13.41	24.06	6.95	44.43	107.49
Poecilia latipinna	Not	-	0.19	0.19	48.66	26.8	8.52	83.99	84.18
Cichlasoma urophthalmus (>6.5 cm)		-	59.68	59.68	-	-	-	0	59.68
Lucania parva	Sampled	2.82	10.05	12.87	0.24	0.87	3.79	4.9	17.77
Lophogobius cyprinoides		13.39	2.59	15.98	-	-	-	0	15.98
Fundulus grandis (>6.5 cm)		-	-	0	-	-	6.56	6.56	6.56
Lepomis punctatus		1.21	1.81	3.02	-	0.14	-	0.14	3.16
Microgobius gulosus		0.71	1.3	2.01	-	-	-	0	2.01
Gambusia holbrooki		-	0.88	0.88	0.87	0.2	-	1.07	1.95
Cyprinodon variegatus		-	1	1	-	-	0.64	0.64	1.64
Gobiosoma robustum		0.89	-	0.89	-	-	-	0	0.89
Tilapia mariae		0.36	0.37	0.73	-	-	-	0	0.73
Belonesox belizanus		-	-	0	-	0.13	-	0.13	0.13
Adinia xenica		-	-	0	-	-	-	0	0
Ameirus natalis		-	-	0	-	-	-	0	0
Ameirus natalis		-	-	0	-	-	-	0	0
Anchoa mitchili		-	-	0	-	-	-	0	0
Cichlasoma bimaculatum		-	-	0	-	-	-	0	0
Clarias batrachus		-	-	0	-	-	-	0	0
Cynoscion nebulosus		-	-	0	-	-	-	0	0
Elassoma evergladei		-	-	0	-	-	-	0	0
Elops saurus		-	-	0	-	-	-	0	0
Enneacanthus glriosus		-	-	0	-	-	-	0	0
Erimyzon sucetta		-	-	0	-	-	-	0	0
Floridichthys carpio		-	-	0	-	-	-	0	0
Fundulus chrysotus		-	-	0	-	-	-	0	0
Fundulus confluentus		-	-	0	-	-	-	0	0
Fundulus grandis	Net	-	-	0	-	-	-	0	0
Fundulus seminolis		-	-	0	-	-	-	0	0
Fundulus similis		-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0	-	-	-	0	0
Gerridae spp.		-	-	0	-	-	-	0	0
Gobiosoma bosci		-	-	0	-	-	-	0	0
Heterandria formosa		-	-	0	-	-	-	0	0
Jordanella floridae		-	-	0	-	-	-	0	0
Large Gerridae spp.		-	-	0	-	-	-	0	0
LARVAE		-	-	0	-	-	-	0	0
Lepomis gulosus		-	-	0	-	-	-	0	0
Lepomis macrochirus	Not	-	-	0	-	-	-	0	0
Lepomis marginatus		-	-	0	-	-	-	0	0
Lepomis micolophus	Net	-	-	0	-	-	-	0	0
Lepomis spp.		-	-	0	-	-	-	0	0
Lucania goodeii		-	-	0	-	-	-	0	0
Menidia peninsulae		-	-	0	-	-	-	0	0
Micropterus salmoides		-	-	0	-	-	-	0	0
Mugil cephalus		-	-	0	-	-	-	0	0
Notropis sp.		-	-	0	-	-	-	0	0
Noturus gyrinus	Sampled	-	-	0	-	-	-	0	0
Opsanus beta		-	-	0	-	-	-	0	0
Oreochromis aureus		-	-	0	-	-	-	0	0
Pogonias chromis		-	-	0	-	-	-	0	0
Scianops ocellatus		-	-	0	-	-	-	0	0
Sphyraena barracuda		-	-	0	-	-	-	0	0
Strongylura notata		-	-	0	-	-	-	0	0
Syngnathus louisianae		-	-	0	-	-	-	0	0
Trinectes maculatus		-	-	0	-	-	-	0	0
Total		27.04	133.27	160.31	63.18	52.21	26.46	141.85	302.17
Mean				80.16				47.28	60.43
Net efficiency	0	0.85	1	0.93	0.8	0.8	1	0.87	0.89
Efficiency adjusted total		31.81	133.27	165.08	78.97	65.26	26.46	170.69	335.77
Efficiency adjusted Mean				82.54				56.9	67.15
Efficiency adjusted SE				50.73				15.725	19.261
Efficiency Adjusted variance				5147.1				741.78	

5	#NETS
2	#DEEP
3	#FLATS
Temp:	
22	
Salin:	
1	
Depth:	
28	
#Species:	
56	
Day:	
10	
Month:	
12	
Year:	
1997	

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in January 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Lucania parva	Sampled	3.01	Sampled	3.01	0.64	Sampled	3.03	3.67	6.69
Floridichthys carpio		1.89		1.89	1.09		0.94	2.03	3.92
Cyprinodon variegatus		-		0	-		1.56	1.56	1.56
Poecilia latipinna	Not	1.48	Not	1.48	-	Not	0.75	0.75	2.23
Microgobius gulosus		0.37		0.37	0.59		0.26	0.85	1.22
Adinia xenica		-		0	-		-	0	0
Ameirus natalis		-		0	-		-	0	0
Ameirus natalis		-		0	-		-	0	0
Anchoa mitchili		-		0	-		-	0	0
Belonesox belizanus		-		0	-		-	0	0
Cichlasoma bimaculatum		-		0	-		-	0	0
Cichlasoma urophthalmus		-		0	-		-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-		0	-		-	0	0
Clarias batrachus		-		0	-		-	0	0
Cynoscion nebulosus		-		0	-		-	0	0
Elassoma evergladei		-		0	-		-	0	0
Elops saurus		-		0	-		-	0	0
Enneacanthus gloriosus		-		0	-		-	0	0
Erimyzon sucetta		-		0	-		-	0	0
Fundulus chrysotus		-		0	-		-	0	0
Fundulus confluentus		-		0	-		-	0	0
Fundulus grandis	Net	-	Net	0	-	Net	-	0	0
Fundulus grandis (>6.5 cm)		-		0	-		-	0	0
Fundulus seminolis		-		0	-		-	0	0
Fundulus similis		-		0	-		-	0	0
Fundulus similis (>6.5 cm)		-		0	-		-	0	0
Gambusia holbrooki		-		0	-		-	0	0
Gerridae spp.		-		0	-		-	0	0
Gobiosoma bosci		-		0	-		-	0	0
Gobiosoma robustum		-		0	-		-	0	0
Heterandria formosa		-		0	-		-	0	0
Jordanella floridae		-		0	-		-	0	0
Large Gerridae spp.		-		0	-		-	0	0
LARVAE		-		0	-		-	0	0
Lepomis gulosus		-		0	-		-	0	0
Lepomis macrochirus	Not	-	Not	0	-	Not	-	0	0
Lepomis marginatus		-		0	-		-	0	0
Lepomis micolophus	Net	-	Net	0	-	Net	-	0	0
Lepomis punctatus		-		0	-		-	0	0
Lepomis spp.		-		0	-		-	0	0
Lophogobius cyprinoides		-		0	-		-	0	0
Lucania goodeii		-		0	-		-	0	0
Menidia peninsulae		-		0	-		-	0	0
Micropterus salmoides		-		0	-		-	0	0
Mugil cephalus		-		0	-		-	0	0
Notropis sp.		-		0	-		-	0	0
Noturus gyrinus	Sampled	-	Sampled	0	-	Sampled	-	0	0
Opsanus beta		-		0	-		-	0	0
Oreochromis aureus		-		0	-		-	0	0
Pogonias chromis		-		0	-		-	0	0
Scianops ocellatus		-		0	-		-	0	0
Sphyraena barracuda		-		0	-		-	0	0
Strongylura notata		-		0	-		-	0	0
Syngnathus louisianae		-		0	-		-	0	0
Tilapia mariae		-		0	-		-	0	0
Trinectes maculatus		-		0	-		-	0	0
Total		6.75		6.75	2.32		6.55	8.87	15.61
Mean				6.75				4.43	5.21
Net efficiency	0	0.78	0	0.78	0.83	0	0.83	0.83	0.81
Efficiency adjusted total		8.65		8.65	2.8		7.89	10.69	19.34
Efficiency adjusted Mean				8.65				5.34	6.45
Efficiency adjusted SE				0				2.545	1.8365
Efficiency Adjusted variance				0				12.954	

3 #NETS
1 #DEEP
2 #FLATS

Temp:
19
Salin:
12
Depth:
30
#Species:
56
Day:
10
Month:
2
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in January 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	55.31	30.46	69.72	155.49	1.19		16.01	17.2	172.69
Fundulus confluentus	14.43	23.65	10.78	48.86	3.31		1.16	4.47	53.32
Fundulus grandis	5.78	3.6	10.72	20.11	4.44	Net	-	4.44	24.54
Poecilia latipinna	5.58	11.22	25.17	41.97	-	Not	-	0	41.97
Cichlasoma urophthalmus	0.46	-	2.54	3	-		3.23	3.23	6.23
Adinia xenica	-	10.87	1.56	12.43	0.82		1.31	2.13	14.56
Gambusia holbrooki	2.93	0.7	0.54	4.17	-		-	0	4.17
Lucania parva	-	-	0.37	0.37	-	Sampled	-	0	0.37
Ameirus natalis	-	-	-	0	-		-	0	0
Ameirus natalis	-	-	-	0	-		-	0	0
Anchoa mitchili	-	-	-	0	-		-	0	0
Belonesox belizanus	-	-	-	0	-		-	0	0
Cichlasoma bimaculatum	-	-	-	0	-		-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-		-	0	0
Clarias batrachus	-	-	-	0	-		-	0	0
Cynoscion nebulosus	-	-	-	0	-		-	0	0
Elassoma evergladei	-	-	-	0	-		-	0	0
Elops saurus	-	-	-	0	-		-	0	0
Enneacanthus gloriosus	-	-	-	0	-		-	0	0
Erimyzon sucetta	-	-	-	0	-		-	0	0
Floridichthys carpio	-	-	-	0	-		-	0	0
Fundulus chrysotus	-	-	-	0	-		-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-		-	0	0
Fundulus seminolis	-	-	-	0	-		-	0	0
Fundulus similis	-	-	-	0	-		-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-		-	0	0
Gerridae spp.	-	-	-	0	-		-	0	0
Gobiosoma bosci	-	-	-	0	-		-	0	0
Gobiosoma robustum	-	-	-	0	-		-	0	0
Heterandria formosa	-	-	-	0	-		-	0	0
Jordanella floridae	-	-	-	0	-		-	0	0
Large Gerridae spp.	-	-	-	0	-		-	0	0
LARVAE	-	-	-	0	-		-	0	0
Lepomis gulosus	-	-	-	0	-		-	0	0
Lepomis macrochirus	-	-	-	0	-	Not	-	0	0
Lepomis marginatus	-	-	-	0	-		-	0	0
Lepomis micolophus	-	-	-	0	-	Net	-	0	0
Lepomis punctatus	-	-	-	0	-		-	0	0
Lepomis spp.	-	-	-	0	-		-	0	0
Lophogobius cyprinoides	-	-	-	0	-		-	0	0
Lucania goodeii	-	-	-	0	-		-	0	0
Menidia peninsulae	-	-	-	0	-		-	0	0
Microgobius gulosus	-	-	-	0	-		-	0	0
Micropterus salmoides	-	-	-	0	-		-	0	0
Mugil cephalus	-	-	-	0	-		-	0	0
Notropis sp.	-	-	-	0	-		-	0	0
Noturus gyrinus	-	-	-	0	-	Sampled	-	0	0
Opsanus beta	-	-	-	0	-		-	0	0
Oreochromis aureus	-	-	-	0	-		-	0	0
Pogonias chromis	-	-	-	0	-		-	0	0
Scianops ocellatus	-	-	-	0	-		-	0	0
Sphyraena barracuda	-	-	-	0	-		-	0	0
Strongylura notata	-	-	-	0	-		-	0	0
Syngnathus louisianae	-	-	-	0	-		-	0	0
Tilapia mariae	-	-	-	0	-		-	0	0
Trinectes maculatus	-	-	-	0	-		-	0	0
Total	84.5	80.5	121.4	286.39	9.76		21.71	31.46	317.85
Mean				95.47				15.73	63.57
Net efficiency	0.8	0.8	1	0.87	1	0	1	1	0.92
Efficiency adjusted total	105.62	100.62	121.4	327.64	9.76		21.71	31.47	359.11
Efficiency adjusted Mean				109.21				15.73	71.82
Efficiency adjusted SE				6.262				5.975	23.23
Efficiency Adjusted variance				117.64				71.401	

5	#NETS
3	#DEEP
2	#FLATS
Temp:	
20	
Salin:	
1	
Depth:	
12	
#Species:	
56	
Day:	
26	
Month:	
1	
Year:	
1998	

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in January 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	5.24	19.43	24.66	-	26.75	1.84	28.59	53.25
Cichlasoma urophthalmus	27.28	103.27	5.56	136.12	0.35	-	-	0.35	136.47
Poecilia latipinna	11.57	77.32	2.18	91.07	1.52	2.38	-	3.9	94.97
Lepomis punctatus	14.58	19.46	-	34.04	-	-	-	0	34.04
Lucania parva	6.93	2.33	0.87	10.13	0.25	2.73	-	2.98	13.12
Gambusia holbrooki	2.42	-	-	2.42	-	1.19	-	1.19	3.61
Fundulus confluentus	-	-	-	0	0.6	-	-	0.6	0.6
Adinia xenica	-	-	-	0	-	0.55	-	0.55	0.55
Lucania goodeii	2.28	-	-	2.28	-	-	-	0	2.28
Lepomis spp.	0.28	-	-	0.28	-	-	-	0	0.28
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	65.34	207.62	28.04	301	2.72	33.6	1.84	38.15	339.16
Mean				100.33				12.72	56.53
Net efficiency	0.9	0.5	1	0.8	0.6	0.9	0.7	0.73	0.77
Efficiency adjusted total	72.6	415.24	28.04	515.88	4.53	37.33	2.63	44.49	560.37
Efficiency adjusted Mean				171.96				14.83	93.39
Efficiency adjusted SE				122.32				11.263	65.209
Efficiency Adjusted variance				44885				380.59	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
12
#Species:
56
Day:
20
Month:
1
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in January 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	50.24	4.66	3.92	58.81	6.02	13.76	0.49	20.27	79.08
Poecilia latipinna	0.34	0.18	0.56	1.08	6.39	16.69	2.93	26.01	27.09
Lucania parva	7.25	9.37	9.84	26.46	-	-	3.16	3.16	29.62
Lepomis punctatus	8.26	6.9	9.38	24.53	1.13	-	-	1.13	25.66
Lophogobius cyprinoides	9.54	-	-	9.54	-	-	-	0	9.54
Microgobius gulosus	0.3	2.33	1.41	4.04	-	-	-	0	4.04
Gambusia holbrooki	-	-	1.89	1.89	0.69	0.14	0.12	0.95	2.84
Tilapia mariae	1.51	0.32	-	1.83	-	-	-	0	1.83
Gobiosoma robustum	0.75	0.41	-	1.16	-	-	-	0	1.16
Fundulus confluentus	-	-	-	0	-	-	0.72	0.72	0.72
Cyprinodon variegatus	-	-	-	0	-	-	0.42	0.42	0.42
Lucania goodeii	0.12	-	-	0.12	-	-	-	0	0.12
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	78.3	24.17	27	129.47	14.23	30.59	7.84	52.66	182.13
Mean				43.16				17.55	30.36
Net efficiency	1	1	0.9	0.97	0.9	0.9	1	0.93	0.95
Efficiency adjusted total	78.3	24.17	30	132.47	15.81	33.99	7.84	57.64	190.11
Efficiency adjusted Mean				44.16				19.21	31.69
Efficiency adjusted SE				17.154				7.7383	10.097
Efficiency Adjusted variance				882.82				179.64	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
23	
Salin:	
0	
Depth:	
23	
#Species:	
56	
Day:	
12	
Month:	
1	
Year:	
1998	

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in February 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	-	-	0.69	0.69	8.32	1.21	12.62	22.15	22.84
Lucania parva	15.78	1.52	0.77	18.06	0.27	0.32	1.59	2.18	20.24
Gerridae spp.	-	-	24.8	24.8	-	-	-	0	24.8
Cyprinodon variegatus	-	-	-	0	-	-	0.94	0.94	0.94
Microgobius gulosus	0.67	1.59	-	2.26	0.33	-	-	0.33	2.59
Strongylura notata	-	1.15	-	1.15	-	-	-	0	1.15
Menidia peninsulae	-	-	0.17	0.17	-	-	-	0	0.17
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	16.44	4.26	26.43	47.14	8.92	1.53	15.15	25.6	72.74
Mean				15.71				8.53	12.12
Net efficiency	0.67	0.78	0.72	0.72	0.83	0.88	0.83	0.85	0.78
Efficiency adjusted total	24.54	5.46	36.71	66.71	10.75	1.74	18.25	30.74	97.45
Efficiency adjusted Mean				22.24				10.25	16.24
Efficiency adjusted SE				9.0943				4.7727	5.3184
Efficiency Adjusted variance				248.12				68.335	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
25
Salin:
14
Depth:
18
#Species:
56
Day:
8
Month:
3
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in February 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	25.04	6.41	9.74	41.19	9.65	8.28	8.58	26.51	67.7
Fundulus confluentus	-	8.7	1.59	10.29	2.26	2.76	4.51	9.53	19.82
Poecilia latipinna	0.88	17.12	2.32	20.32	-	-	-	0	20.32
Cichlasoma urophthalmus	0.87	6.45	3.82	11.14	-	-	0.74	0.74	11.88
Lepomis punctatus	5.02	-	-	5.02	-	-	-	0	5.02
Gambusia holbrooki	2.17	-	1.01	3.18	-	0.28	-	0.28	3.46
Lucania parva	1.06	1.05	0.79	2.91	-	-	-	0	2.91
Adinia xenica	-	1.14	-	1.14	-	-	-	0	1.14
Fundulus chrysotus	-	0.87	-	0.87	-	-	-	0	0.87
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	35.04	41.74	19.27	96.05	11.91	11.32	13.83	37.06	133.11
Mean				32.02				12.35	22.19
Net efficiency	0.9	0.8	1	0.9	0.8	0.95	1	0.92	0.91
Efficiency adjusted total	38.93	52.17	19.27	110.37	14.89	11.92	13.83	40.64	151.01
Efficiency adjusted Mean				36.79				13.55	25.17
Efficiency adjusted SE				9.5575				0.869	6.7404
Efficiency Adjusted variance				274.04				2.2655	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
15
#Species:
56
Day:
5
Month:
3
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in February 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	-	5.52	5.52	-		4.77	4.77	10.29
Poecilia latipinna	0.76	39.54	-	40.3	1.27	Not	-	1.27	41.57
Cichlasoma urophthalmus	1.22	43.65	1.62	46.49	-		-	0	46.49
Fundulus confluentus	-	-	-	0	-		3.95	3.95	3.95
Cichlasoma urophthalmus (>6.5 cm)	-	18.83	-	18.83	-		-	0	18.83
Lepomis punctatus	7	10.2	-	17.2	-		-	0	17.2
Lucania parva	3.67	0.43	1.32	5.43	-	Sampled	-	0	5.43
Gambusia holbrooki	0.66	-	1.21	1.87	0.28		-	0.28	2.15
Lucania goodeii	2.19	-	0.32	2.51	-		-	0	2.51
Belonesox belizanus	-	1.95	-	1.95	-		-	0	1.95
Lepomis marginatus	-	1.72	-	1.72	-		-	0	1.72
Adinia xenica	-	-	-	0	-		-	0	0
Ameirus natalis	-	-	-	0	-		-	0	0
Ameirus natalis	-	-	-	0	-		-	0	0
Anchoa mitchili	-	-	-	0	-		-	0	0
Cichlasoma bimaculatum	-	-	-	0	-		-	0	0
Clarias batrachus	-	-	-	0	-		-	0	0
Cynoscion nebulosus	-	-	-	0	-		-	0	0
Elassoma evergladei	-	-	-	0	-		-	0	0
Elops saurus	-	-	-	0	-		-	0	0
Enneacanthus gloriosus	-	-	-	0	-		-	0	0
Erimyzon sucetta	-	-	-	0	-		-	0	0
Floridichthys carpio	-	-	-	0	-		-	0	0
Fundulus chrysotus	-	-	-	0	-		-	0	0
Fundulus grandis	-	-	-	0	-	Net	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-		-	0	0
Fundulus seminolis	-	-	-	0	-		-	0	0
Fundulus similis	-	-	-	0	-		-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-		-	0	0
Gerridae spp.	-	-	-	0	-		-	0	0
Gobiosoma bosci	-	-	-	0	-		-	0	0
Gobiosoma robustum	-	-	-	0	-		-	0	0
Heterandria formosa	-	-	-	0	-		-	0	0
Jordanella floridae	-	-	-	0	-		-	0	0
Large Gerridae spp.	-	-	-	0	-		-	0	0
LARVAE	-	-	-	0	-		-	0	0
Lepomis gulosus	-	-	-	0	-		-	0	0
Lepomis macrochirus	-	-	-	0	-	Not	-	0	0
Lepomis micolophus	-	-	-	0	-	Net	-	0	0
Lepomis spp.	-	-	-	0	-		-	0	0
Lophogobius cyprinoides	-	-	-	0	-		-	0	0
Menidia peninsulae	-	-	-	0	-		-	0	0
Microgobius gulosus	-	-	-	0	-		-	0	0
Micropterus salmoides	-	-	-	0	-		-	0	0
Mugil cephalus	-	-	-	0	-		-	0	0
Notropis sp.	-	-	-	0	-		-	0	0
Noturus gyrinus	-	-	-	0	-	Sampled	-	0	0
Opsanus beta	-	-	-	0	-		-	0	0
Oreochromis aureus	-	-	-	0	-		-	0	0
Pogonias chromis	-	-	-	0	-		-	0	0
Scianops ocellatus	-	-	-	0	-		-	0	0
Sphyraena barracuda	-	-	-	0	-		-	0	0
Strongylura notata	-	-	-	0	-		-	0	0
Syngnathus louisianae	-	-	-	0	-		-	0	0
Tilapia mariae	-	-	-	0	-		-	0	0
Trinectes maculatus	-	-	-	0	-		-	0	0
Total	15.5	116.31	9.99	141.81	1.55		8.72	10.27	152.08
Mean				47.27				5.14	30.41
Net efficiency	0.8	0.8	1	0.87	1	0	0.9	0.95	0.9
Efficiency adjusted total	19.37	145.39	9.99	174.75	1.55		9.69	11.24	185.99
Efficiency adjusted Mean				58.25				5.62	37.2
Efficiency adjusted SE				43.654				4.07	27.195
Efficiency Adjusted variance				5717				33.13	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
23
Salin:
0
Depth:
17
#Species:
56
Day:
26
Month:
2
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in February 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Poecilia latipinna	-	-	-	0	35.56	9.15	17.82	62.53	62.53
Cichlasoma urophthalmus (>6.5 cm)	33.99	-	18.1	52.09	-	21.1	-	21.1	73.19
Cichlasoma urophthalmus	17.4	3.81	5.19	26.4	5.09	6.59	5.76	17.44	43.84
Lepomis punctatus	13.82	15.13	-	28.95	-	-	-	0	28.95
Cyprinodon variegatus	-	-	-	0	-	4.01	5.86	9.87	9.87
Lophogobius cyprinoides	0.89	6.78	-	7.67	-	-	-	0	7.67
Lucania parva	0.45	2.2	3.02	5.68	-	-	0.67	0.67	6.35
Fundulus confluentus	-	-	-	0	-	-	1.95	1.95	1.95
Menidia peninsulae	-	-	1.86	1.86	0.34	-	-	0.34	2.2
Microgobius gulosus	-	1.25	0.67	1.92	-	-	-	0	1.92
Gambusia holbrooki	-	0.63	-	0.63	-	1.01	-	1.01	1.64
Lepomis marginatus	-	-	-	0	-	-	1	1	1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	66.55	29.8	28.85	125.2	40.99	41.86	33.06	115.91	241.12
Mean				41.73				38.64	40.19
Net efficiency	0.8	1	0.7	0.83	0.9	0.9	1	0.93	0.88
Efficiency adjusted total	83.19	29.8	41.21	154.2	45.54	46.51	33.06	125.11	279.31
Efficiency adjusted Mean				51.4				41.7	46.55
Efficiency adjusted SE				16.233				4.3307	7.82
Efficiency Adjusted variance				790.5				56.266	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
0
Depth:
29
#Species:
56
Day:
19
Month:
2
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in March 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	0.88	43.59	52.6	97.07				0	97.07
Fundulus grandis	2.92	18.02	29.36	50.3	Net	Net	Net	0	50.3
Fundulus similis (>6.5 cm)	-	8.71	39.37	48.08				0	48.08
Fundulus grandis (>6.5 cm)	-	19.63	26.66	46.29				0	46.29
Floridichthys carpio	28.02	1.08	1.64	30.74				0	30.74
Lucania parva	8.07	0.95	2	11.03				0	11.03
Fundulus similis	-	-	9.74	9.74				0	9.74
Poecilia latipinna	1.06	-	6.65	7.71	Dry	Dry	Dry	0	7.71
Cichlasoma urophthalmus	4.8	-	-	4.8				0	4.8
Microgobius gulosus	1.28	-	-	1.28				0	1.28
Adinia xenica	1.02	-	-	1.02				0	1.02
Fundulus confluentus	-	-	0.86	0.86				0	0.86
Gambusia holbrooki	0.27	-	-	0.27				0	0.27
Strongylura notata	0.05	-	-	0.05				0	0.05
Syngnathus scovelli	0.03	-	-	0.03				0	0.03
Ameirus natalis	-	-	-	0				0	0
Anchoa mitchili	-	-	-	0				0	0
Belonesox belizanus	-	-	-	0				0	0
Cichlasoma bimaculatum	-	-	-	0				0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0				0	0
Clarias batrachus	-	-	-	0	Dry	Dry	Dry	0	0
Cynoscion nebulosus	-	-	-	0				0	0
Elassoma evergladei	-	-	-	0				0	0
Elops saurus	-	-	-	0				0	0
Enneacanthus glriosus	-	-	-	0				0	0
Erimyzon sucetta	-	-	-	0				0	0
Fundulus chrysotus	-	-	-	0				0	0
Fundulus seminolis	-	-	-	0				0	0
Gerridae spp.	-	-	-	0				0	0
Gobiosoma bosci	-	-	-	0				0	0
Gobiosoma robustum	-	-	-	0				0	0
Heterandria formosa	-	-	-	0				0	0
Ictalurus spp.	-	-	-	0				0	0
Jordanella floridae	-	-	-	0				0	0
Large Gerridae spp.	-	-	-	0				0	0
LARVAE	-	-	-	0				0	0
Lepisosteus platyrhincus	-	-	-	0				0	0
Lepomis gulosus	-	-	-	0				0	0
Lepomis macrochirus	-	-	-	0	Net	Net	Net	0	0
Lepomis marginatus	-	-	-	0				0	0
Lepomis micolophus	-	-	-	0				0	0
Lepomis punctatus	-	-	-	0				0	0
Lepomis spp.	-	-	-	0				0	0
Lophogobius cyprinoides	-	-	-	0				0	0
Lucania goodeii	-	-	-	0				0	0
Menidia peninsulae	-	-	-	0				0	0
Micropterus salmoides	-	-	-	0				0	0
Mugil cephalus	-	-	-	0				0	0
Notropis sp.	-	-	-	0				0	0
Noturus gyrinus	-	-	-	0				0	0
Opsanus beta	-	-	-	0				0	0
Oreochromis aureus	-	-	-	0				0	0
Pogonias chromis	-	-	-	0				0	0
Scianops ocellatus	-	-	-	0				0	0
Sphyraena barracuda	-	-	-	0				0	0
Syngnathus louisianae	-	-	-	0				0	0
Tilapia mariae	-	-	-	0				0	0
Trinectes maculatus	-	-	-	0				0	0
Total	48.4	91.98	168.88	309.26				0	309.26
Mean				103.09					103.09
Net efficiency	0.8	1	0.72	0.84	0	0	0		0.84
Efficiency adjusted total	60.5	91.98	234.56	387.04					387.04
Efficiency adjusted Mean				129.01					129.01
Efficiency adjusted SE				53.55					53.55
Efficiency Adjusted variance				8602.8				0	

3 #NETS
3 #DEEP
0 #FLATS

Temp:
25
Salin:
10
Depth:
-1
#Species:
58
Day:
4
Month:
4
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in March 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Fundulus confluentus	-	10.19	-	10.19	2.66	6.66	-	9.32	19.51
Cyprinodon variegatus	-	0.09	0.81	0.9	0.22	1.2	0.53	1.95	2.85
Cichlasoma urophthalmus	2.6	2.58	5.13	10.31	-	-	-	0	10.31
Poecilia latipinna	1.5	0.88	-	2.38	-	-	-	0	2.38
Gambusia holbrooki	0.82	0.4	-	1.22	0.08	-	-	0.08	1.3
Lucania parva	0.18	0.4	0.66	1.24	-	-	-	0	1.24
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	5.1	14.54	6.6	26.24	2.96	7.86	0.53	11.35	37.59
Mean				8.75				3.78	6.27
Net efficiency	1	0.9	1	0.97	0.8	1	1	0.93	0.95
Efficiency adjusted total	5.1	16.16	6.6	27.86	3.7	7.86	0.53	12.09	39.95
Efficiency adjusted Mean				9.29				4.03	6.66
Efficiency adjusted SE				3.4638				2.1224	2.1638
Efficiency Adjusted variance				35.995				13.514	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
0
Depth:
13
#Species:
58
Day:
1
Month:
4
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in March 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	-	4.48	4.48	-	45.55	10.39	55.94	60.42
Lepomis punctatus	4.52	24.15	-	28.67	-	-	-	0	28.67
Cichlasoma urophthalmus	-	21.21	-	21.21	-	-	-	0	21.21
Poecilia latipinna	-	18.83	-	18.83	-	-	-	0	18.83
Gambusia holbrooki	-	0.75	-	0.75	-	1.47	-	1.47	2.22
Lucania parva	2.54	0.57	-	3.11	-	0.28	-	0.28	3.39
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	7.06	65.51	4.48	77.05	0	47.3	10.39	57.69	134.74
Mean				25.68				19.23	22.46
Net efficiency	1	0.9	1	0.97	1	0.9	1	0.97	0.97
Efficiency adjusted total	7.06	72.79	4.48	84.33	0	52.56	10.39	62.95	147.28
Efficiency adjusted Mean				28.11				20.98	24.55
Efficiency adjusted SE				22.352				13.598	11.577
Efficiency Adjusted variance				1498.9				554.72	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
0
Depth:
16
#Species:
58
Day:
27
Month:
3
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in March 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus		20.42	3.59	24.01	46.68	6.37	3.35	56.4	80.41
Lepomis punctatus		1.3	7.66	8.96	-	-	-	0	8.96
Lucania parva	Sampled	1.52	1.76	3.28	-	-	0.47	0.47	3.75
Tilapia mariae		-	-	0	1.35	-	2.98	4.33	4.33
Poecilia latipinna	Not	0.03	0.5	0.53	-	3.36	-	3.36	3.89
Lophogobius cyprinoides		3.23	-	3.23	-	-	-	0	3.23
Lepomis marginatus		-	-	0	2.21	-	-	2.21	2.21
Microgobius gulosus		0.91	-	0.91	-	-	-	0	0.91
Cyprinodon variegatus		-	0.49	0.49	-	-	0.05	0.05	0.54
Belonesox belizanus		0.14	-	0.14	-	-	-	0	0.14
Gambusia holbrooki		-	0.03	0.03	-	-	-	0	0.03
Adinia xenica		-	-	0	-	-	-	0	0
Ameirus natalis		-	-	0	-	-	-	0	0
Anchoa mitchili		-	-	0	-	-	-	0	0
Cichlasoma bimaculatum		-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-	-	0	-	-	-	0	0
Clarias batrachus	Sampled	-	-	0	-	-	-	0	0
Cynoscion nebulosus		-	-	0	-	-	-	0	0
Elassoma evergladei		-	-	0	-	-	-	0	0
Elops saurus		-	-	0	-	-	-	0	0
Enneacanthus gloriosus		-	-	0	-	-	-	0	0
Erimyzon sucetta		-	-	0	-	-	-	0	0
Floridichthys carpio		-	-	0	-	-	-	0	0
Fundulus chrysotus		-	-	0	-	-	-	0	0
Fundulus confluentus		-	-	0	-	-	-	0	0
Fundulus grandis	Net	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)		-	-	0	-	-	-	0	0
Fundulus seminolis		-	-	0	-	-	-	0	0
Fundulus similis		-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0	-	-	-	0	0
Gerridae spp.		-	-	0	-	-	-	0	0
Gobiosoma bosci		-	-	0	-	-	-	0	0
Gobiosoma robustum		-	-	0	-	-	-	0	0
Heterandria formosa		-	-	0	-	-	-	0	0
Ictalurus spp.		-	-	0	-	-	-	0	0
Jordanella floridae		-	-	0	-	-	-	0	0
Large Gerridae spp.		-	-	0	-	-	-	0	0
LARVAE		-	-	0	-	-	-	0	0
Lepisosteus platyrhincus		-	-	0	-	-	-	0	0
Lepomis gulosus		-	-	0	-	-	-	0	0
Lepomis macrochirus	Not	-	-	0	-	-	-	0	0
Lepomis micolophus	Net	-	-	0	-	-	-	0	0
Lepomis spp.		-	-	0	-	-	-	0	0
Lucania goodeii		-	-	0	-	-	-	0	0
Menidia peninsulae		-	-	0	-	-	-	0	0
Micropterus salmoides		-	-	0	-	-	-	0	0
Mugil cephalus		-	-	0	-	-	-	0	0
Notropis sp.		-	-	0	-	-	-	0	0
Noturus gyrinus		-	-	0	-	-	-	0	0
Opsanus beta		-	-	0	-	-	-	0	0
Oreochromis aureus		-	-	0	-	-	-	0	0
Pogonias chromis		-	-	0	-	-	-	0	0
Scianops ocellatus		-	-	0	-	-	-	0	0
Sphyraena barracuda		-	-	0	-	-	-	0	0
Strongylura notata		-	-	0	-	-	-	0	0
Syngnathus louisianae		-	-	0	-	-	-	0	0
Syngnathus scovelli		-	-	0	-	-	-	0	0
Trinectes maculatus		-	-	0	-	-	-	0	0
Total		27.55	14.03	41.58	50.24	9.73	6.85	66.82	108.4
Mean				20.79				22.27	21.68
Net efficiency	0	0.8	0.9	0.85	0.8	0.6	0.8	0.73	0.78
Efficiency adjusted total		34.44	15.59	50.03	62.8	16.22	8.56	87.58	137.61
Efficiency adjusted Mean				25.02				29.19	27.52
Efficiency adjusted SE				9.425				16.948	9.8032
Efficiency Adjusted variance				177.66				861.72	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
22
Salin:
2
Depth:
24
#Species:
58
Day:
24
Month:
3
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in April 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	0.45	2.49	12.24	15.18	5.83	3.83	0.8	10.46	25.64
Floridichthys carpio	0.64	0.72	1.23	2.59	7.02	-	-	7.02	9.61
Lucania parva	11.6	3.74	3.27	18.61	0.81	0.53	0.18	1.52	20.12
Gerridae spp.	4.67	6.08	0.14	10.89	2.57	-	-	2.57	13.46
Menidia peninsulae	1.07	-	4.28	5.35	-	-	-	0	5.35
Microgobius gulosus	0.98	0.68	2.12	3.79	-	-	-	0	3.79
Strongylura notata	-	-	-	0	0.48	-	-	0.48	0.48
Fundulus grandis	-	0.62	-	0.62	-	-	-	0	0.62
Opsanus beta	0.16	-	-	0.16	0.08	-	-	0.08	0.24
Gambusia holbrooki	-	-	0.11	0.11	-	-	-	0	0.11
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	19.58	14.32	23.39	57.3	16.79	4.36	0.98	22.13	79.43
Mean				19.1				7.38	13.24
Net efficiency	0.9	1	1	0.97	0.9	1	0.8	0.9	0.93
Efficiency adjusted total	21.76	14.32	23.39	59.47	18.66	4.36	1.22	24.24	83.71
Efficiency adjusted Mean				19.82				8.08	13.95
Efficiency adjusted SE				2.7916				5.3671	3.7703
Efficiency Adjusted variance				23.379				86.417	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
28
Salin:
22
Depth:
10
#Species:
58
Day:
3
Month:
5
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in April 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	5.06	24.49	66.92	96.47				0	96.47
Fundulus confluentus	32.58	22.28	36.5	91.37				0	91.37
Fundulus grandis	14.75	18.07	14.53	47.35	Net	Net	Net	0	47.35
Poecilia latipinna	19.11	7.09	5.22	31.42	Dry	Dry	Dry	0	31.42
Fundulus grandis (>6.5 cm)	16.83	-	9.04	25.87				0	25.87
Adinia xenica	3.48	7.71	1.57	12.76				0	12.76
Gambusia holbrooki	7.28	4.05	0.92	12.25				0	12.25
Belonesox belizanus	-	1.12	-	1.12				0	1.12
Jordanella floridae	0.92	-	-	0.92				0	0.92
Ameirus natalis	-	-	-	0				0	0
Anchoa mitchili	-	-	-	0				0	0
Cichlasoma bimaculatum	-	-	-	0				0	0
Cichlasoma urophthalmus	-	-	-	0				0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0				0	0
Clarias batrachus	-	-	-	0	Dry	Dry	Dry	0	0
Cynoscion nebulosus	-	-	-	0				0	0
Elassoma evergladei	-	-	-	0				0	0
Elops saurus	-	-	-	0				0	0
Enneacanthus gloriosus	-	-	-	0				0	0
Erimyzon sucetta	-	-	-	0				0	0
Floridichthys carpio	-	-	-	0				0	0
Fundulus chrysotus	-	-	-	0				0	0
Fundulus seminolis	-	-	-	0				0	0
Fundulus similis	-	-	-	0				0	0
Fundulus similis (>6.5 cm)	-	-	-	0				0	0
Gerridae spp.	-	-	-	0				0	0
Gobiosoma bosci	-	-	-	0				0	0
Gobiosoma robustum	-	-	-	0				0	0
Heterandria formosa	-	-	-	0				0	0
Ictalurus spp.	-	-	-	0				0	0
Large Gerridae spp.	-	-	-	0				0	0
LARVAE	-	-	-	0				0	0
Lepisosteus platyrhincus	-	-	-	0				0	0
Lepomis gulosus	-	-	-	0				0	0
Lepomis macrochirus	-	-	-	0	Net	Net	Net	0	0
Lepomis marginatus	-	-	-	0				0	0
Lepomis micolophus	-	-	-	0				0	0
Lepomis punctatus	-	-	-	0				0	0
Lepomis spp.	-	-	-	0				0	0
Lophogobius cyprinoides	-	-	-	0				0	0
Lucania goodeii	-	-	-	0				0	0
Lucania parva	-	-	-	0				0	0
Menidia peninsulae	-	-	-	0				0	0
Microgobius gulosus	-	-	-	0				0	0
Micropterus salmoides	-	-	-	0				0	0
Mugil cephalus	-	-	-	0				0	0
Notropis sp.	-	-	-	0				0	0
Noturus gyrinus	-	-	-	0				0	0
Opsanus beta	-	-	-	0				0	0
Oreochromis aureus	-	-	-	0				0	0
Pogonias chromis	-	-	-	0				0	0
Scianops ocellatus	-	-	-	0				0	0
Sphyraena barracuda	-	-	-	0				0	0
Strongylura notata	-	-	-	0				0	0
Syngnathus louisianae	-	-	-	0				0	0
Syngnathus scovelli	-	-	-	0				0	0
Tilapia mariae	-	-	-	0				0	0
Trinectes maculatus	-	-	-	0				0	0
Total	100.01	84.82	134.7	319.54				0	319.54
Mean				106.51					106.51
Net efficiency	1	0.9	0.9	0.93	0	0	0		0.93
Efficiency adjusted total	100.01	94.24	149.67	343.92					343.92
Efficiency adjusted Mean				114.64					114.64
Efficiency adjusted SE				17.594					17.594
Efficiency Adjusted variance				928.65				0	

3 #NETS
3 #DEEP
0 #FLATS

Temp:
24
Salin:
1
Depth:
3
#Species:
58
Day:
25
Month:
4
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in April 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	1.56	-	14.84	16.39	-	11.51	2.64	14.15	30.54
Poecilia latipinna	18.67	41.07	47.66	107.4	0.59	-	0.02	0.61	108.01
Cichlasoma urophthalmus	92.55	9.97	-	102.52	-	-	-	0	102.52
Lepomis punctatus	33.38	39.62	-	73	-	-	-	0	73
Cichlasoma urophthalmus (>6.5 cm)	-	62.98	-	62.98	-	-	-	0	62.98
Fundulus confluentus	-	-	3.7	3.7	-	5.06	1.95	7	10.71
Fundulus chrysotus	-	-	-	0	1.7	-	-	1.7	1.7
Lucania parva	2.37	0.1	-	2.47	-	-	-	0	2.47
Menidia peninsulae	-	-	0.32	0.32	-	-	-	0	0.32
Heterandria formosa	-	-	-	0	0.04	-	-	0.04	0.04
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus glriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	148.53	153.74	66.51	368.79	2.33	16.57	4.61	23.5	392.29
Mean				122.93				7.84	65.38
Net efficiency	1	0.6	0.9	0.83	0.9	1	1	0.97	0.9
Efficiency adjusted total	148.53	256.23	73.9	478.66	2.59	16.57	4.61	23.77	502.43
Efficiency adjusted Mean				159.55				7.92	83.74
Efficiency adjusted SE				52.922				4.3625	41.395
Efficiency Adjusted variance				8402.2				57.094	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
1
Depth:
10
#Species:
58
Day:
21
Month:
4
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in April 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	110.54	69.33	76.38	256.26	1.68	1.18	-	2.86	259.12
Lepomis punctatus	34.1	7.96	0.15	42.21	-	-	-	0	42.21
Cichlasoma urophthalmus (>6.5 cm)	10.24	15.79	11.58	37.61	-	-	-	0	37.61
Poecilia latipinna	1.16	-	10.81	11.97	1.59	0.04	2.91	4.54	16.51
Lepomis marginatus	5.11	7	-	12.11	-	-	-	0	12.11
Lophogobius cyprinoides	2.98	8.72	-	11.7	-	-	-	0	11.7
Micropterus salmoides	3.16	-	-	3.16	-	-	-	0	3.16
Cyprinodon variegatus	0.76	-	-	0.76	-	-	1.49	1.49	2.25
Jordanella floridae	-	-	-	0	-	-	1.98	1.98	1.98
Belonesox belizanus	-	-	-	0	-	0.36	1.05	1.41	1.41
Lucania parva	-	0.96	0.36	1.32	-	-	-	0	1.32
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	168.05	109.76	99.28	377.1	3.27	1.58	7.43	12.28	389.38
Mean				125.7				4.09	64.89
Net efficiency	0.9	1	0.9	0.93	1	1	0.9	0.97	0.95
Efficiency adjusted total	186.72	109.76	110.31	406.79	3.27	1.58	8.26	13.11	419.9
Efficiency adjusted Mean				135.6				4.37	69.98
Efficiency adjusted SE				25.562				2.0053	31.504
Efficiency Adjusted variance				1960.3				12.063	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
0
Depth:
10
#Species:
58
Day:
17
Month:
4
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in June 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	2.43	11.27	13.7	3.04	20.15	15.67	38.86	52.56
Floridichthys carpio	-	8.26	1.73	9.99	3.04	6.76	-	9.8	19.79
Lucania parva	6.84	1.18	0.9	8.92	0.52	0.78	-	1.3	10.22
Gerridae spp.	-	2.2	1.89	4.09	-	-	-	0	4.09
Cichlasoma urophthalmus	-	-	0.87	0.87	-	0.76	-	0.76	1.63
Menidia peninsulae	1.34	1.38	-	2.72	-	-	-	0	2.72
Fundulus grandis	-	1.38	1.32	2.7	-	-	-	0	2.7
Opsanus beta	0.98	-	-	0.98	-	-	-	0	0.98
Microgobius gulosus	0.31	0.05	0.37	0.73	-	-	-	0	0.73
Gambusia holbrooki	-	-	-	0	-	0.14	-	0.14	0.14
Poecilia latipinna	0.17	-	-	0.17	-	-	-	0	0.17
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	9.63	16.88	18.35	44.86	6.6	28.59	15.67	50.86	95.72
Mean				14.95				16.95	15.95
Net efficiency	1	1	1	1	0.8	1	0.6	0.8	0.9
Efficiency adjusted total	9.63	16.88	18.35	44.86	8.25	28.59	26.12	62.96	107.82
Efficiency adjusted Mean				14.95				20.99	17.97
Efficiency adjusted SE				2.6953				6.4081	3.3891
Efficiency Adjusted variance				21.794				123.19	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
21
Depth:
15
#Species:
58
Day:
27
Month:
6
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in June 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	13.88	5.19	-	19.07	22.33	20.4	31.91	74.64	93.71
Fundulus confluentus	-	4.21	-	4.21	5.57	5.96	7.66	19.19	23.4
Poecilia latipinna	5.2	5.07	7.15	17.42	-	11.86	0.97	12.83	30.25
Fundulus grandis (>6.5 cm)	-	-	75.32	75.32	-	-	-	0	75.32
Fundulus grandis	-	1.62	-	1.62	-	2.94	8.11	11.05	12.66
Cichlasoma urophthalmus (>6.5 cm)	51.07	-	-	51.07	-	-	-	0	51.07
Adinia xenica	-	-	-	0	-	5.57	-	5.57	5.57
Jordanella floridae	-	-	-	0	-	1.97	-	1.97	1.97
Gambusia holbrooki	0.5	0.49	0.1	1.09	-	1.34	-	1.34	2.43
Lucania parva	0.86	0.75	0.33	1.94	-	-	-	0	1.94
Cichlasoma urophthalmus	-	0.16	0.85	1.01	-	-	-	0	1.01
Belonesox belizanus	-	0.41	-	0.41	-	-	-	0	0.41
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	71.51	17.9	83.75	173.15	27.9	50.04	48.64	126.59	299.74
Mean				57.72				42.19	49.96
Net efficiency	1	1	1	1	1	1	1	1	1
Efficiency adjusted total	71.51	17.9	83.75	173.16	27.9	50.04	48.64	126.58	299.74
Efficiency adjusted Mean				57.72				42.19	49.96
Efficiency adjusted SE				20.221				7.1581	10.202
Efficiency Adjusted variance				1226.7				153.71	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
32
Salin:
3
Depth:
8
#Species:
58
Day:
23
Month:
6
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in June 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	-	-	0	0.94	30.84	7.34	39.12	39.12
Cichlasoma urophthalmus (>6.5 cm)	-	61.93	-	61.93	-	11.8	-	11.8	73.73
Poecilia latipinna	14.4	27.19	-	41.6	-	6.14	3.14	9.29	50.89
Cichlasoma urophthalmus	7.94	30.57	14.1	52.61	0.08	0.13	4.12	4.33	56.94
Lucania parva	8.19	4.64	0.42	13.25	0.3	2.86	1.26	4.42	17.67
Fundulus confluentus	-	-	-	0	0.73	2.99	-	3.72	3.72
Lepomis punctatus	-	17.26	-	17.26	-	-	-	0	17.26
Gambusia holbrooki	-	0.95	-	0.95	-	-	1.09	1.09	2.04
Tilapia mariae	6.04	0.79	-	6.83	-	-	-	0	6.83
Menidia peninsulae	-	-	-	0	-	0.24	-	0.24	0.24
Belonesox belizanus	-	-	-	0	0.06	-	-	0.06	0.06
Microgobius gulosus	0.3	-	-	0.3	-	-	-	0	0.3
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	36.88	143.34	14.52	194.73	2.11	55	16.95	74.06	268.79
Mean				64.91				24.69	44.8
Net efficiency	0.7	0.9	1	0.87	0.6	0.83	0.9	0.78	0.82
Efficiency adjusted total	52.69	159.27	14.52	226.48	3.52	66.27	18.83	88.62	315.1
Efficiency adjusted Mean				75.49				29.54	52.52
Efficiency adjusted SE				43.313				18.889	23.498
Efficiency Adjusted variance				5628.1				1070.4	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
32
Salin:
0
Depth:
14
#Species:
58
Day:
17
Month:
6
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in June 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	176.62	282.83	174.03	633.48	-	-	-	0	633.48
Cichlasoma urophthalmus	170.55	64.16	88.98	323.69	1.09	-	-	1.09	324.78
Poecilia latipinna	9.76	21.37	9.78	40.91	0.44	0.69	0.03	1.16	42.07
Lophogobius cyprinoides	6.85	14.56	-	21.4	-	-	-	0	21.4
Lucania parva	1.86	0.88	5.16	7.9	0.43	-	-	0.43	8.33
Menidia peninsulae	1.38	4.13	1.41	6.92	-	-	-	0	6.92
Microgobius gulosus	1.38	4.42	-	5.8	0.03	-	-	0.03	5.83
Cyprinodon variegatus	-	-	-	0	3.98	0.27	-	4.25	4.25
Tilapia mariae	0.48	0.46	0.99	1.93	-	-	-	0	1.93
Belonesox belizanus	-	-	-	0	0.73	0.25	-	0.98	0.98
Fundulus confluentus	-	-	-	0	-	0.6	0.04	0.64	0.64
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	368.88	392.81	280.35	1042	6.7	1.81	0.07	8.57	1050.6
Mean				347.35				2.86	175.1
Net efficiency	0.8	1	1	0.93	0.8	0.83	0.95	0.86	0.9
Efficiency adjusted total	461.1	392.81	280.35	1134.3	8.37	2.18	0.07	10.62	1144.9
Efficiency adjusted Mean				378.09				3.54	190.81
Efficiency adjusted SE				52.695				2.4906	87.011
Efficiency Adjusted variance				8330.2				18.61	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
31
Salin:
10
Depth:
4
#Species:
58
Day:
12
Month:
6
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in September 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Gerridae spp.	24.25	25.87		50.12	-	-	2.25	2.25	52.36
Lucania parva	3.55	5.31	Sampled	8.86	0.77	1.48	0.96	3.21	12.07
Microgobius gulosus	0.77	0.17		0.94	0.97	1.29	0.29	2.55	3.49
Cyprinodon variegatus	0.2	0.63		0.83	0.25	0.8	0.65	1.7	2.53
Cichlasoma urophthalmus	-	-		0	-	-	0.24	0.24	0.24
Gambusia holbrooki	0.02	-		0.02	-	-	-	0	0.02
Adinia xenica	-	-		0	-	-	-	0	0
Ameirus natalis	-	-		0	-	-	-	0	0
Anchoa mitchili	-	-		0	-	-	-	0	0
Belonesox belizanus	-	-		0	-	-	-	0	0
Cichlasoma bimaculatum	-	-		0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-		0	-	-	-	0	0
Clarias batrachus	-	-	Sampled	0	-	-	-	0	0
Cynoscion nebulosus	-	-		0	-	-	-	0	0
Elassoma evergladei	-	-		0	-	-	-	0	0
Elops saurus	-	-		0	-	-	-	0	0
Enneacanthus gloriosus	-	-		0	-	-	-	0	0
Erimyzon sucetta	-	-		0	-	-	-	0	0
Floridichthys carpio	-	-		0	-	-	-	0	0
Fundulus chrysotus	-	-		0	-	-	-	0	0
Fundulus confluentus	-	-		0	-	-	-	0	0
Fundulus grandis	-	-	Net	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-		0	-	-	-	0	0
Fundulus seminolis	-	-		0	-	-	-	0	0
Fundulus similis	-	-		0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-		0	-	-	-	0	0
Gobiosoma bosci	-	-		0	-	-	-	0	0
Gobiosoma robustum	-	-		0	-	-	-	0	0
Heterandria formosa	-	-		0	-	-	-	0	0
Ictalurus spp.	-	-		0	-	-	-	0	0
Jordanella floridae	-	-		0	-	-	-	0	0
Large Gerridae spp.	-	-		0	-	-	-	0	0
LARVAE	-	-		0	-	-	-	0	0
Lepisosteus platyrhincus	-	-		0	-	-	-	0	0
Lepomis gulosus	-	-		0	-	-	-	0	0
Lepomis macrochirus	-	-	Not	0	-	-	-	0	0
Lepomis marginatus	-	-		0	-	-	-	0	0
Lepomis micolophus	-	-	Net	0	-	-	-	0	0
Lepomis punctatus	-	-		0	-	-	-	0	0
Lepomis spp.	-	-		0	-	-	-	0	0
Lophogobius cyprinoides	-	-		0	-	-	-	0	0
Lucania goodeii	-	-		0	-	-	-	0	0
Menidia peninsulae	-	-		0	-	-	-	0	0
Micropterus salmoides	-	-		0	-	-	-	0	0
Mugil cephalus	-	-		0	-	-	-	0	0
Notropis sp.	-	-		0	-	-	-	0	0
Noturus gyrinus	-	-		0	-	-	-	0	0
Opsanus beta	-	-		0	-	-	-	0	0
Oreochromis aureus	-	-		0	-	-	-	0	0
Poecilia latipinna	-	-	Not	0	-	-	-	0	0
Pogonias chromis	-	-		0	-	-	-	0	0
Scianops ocellatus	-	-		0	-	-	-	0	0
Sphyraena barracuda	-	-		0	-	-	-	0	0
Strongylura notata	-	-		0	-	-	-	0	0
Syngnathus louisianae	-	-		0	-	-	-	0	0
Syngnathus scovelli	-	-		0	-	-	-	0	0
Tilapia mariae	-	-		0	-	-	-	0	0
Trinectes maculatus	-	-		0	-	-	-	0	0
Total	28.79	31.97		60.77	1.99	3.58	4.38	9.95	70.71
Mean				30.38				3.32	14.14
Net efficiency	1	1	0	1	0.82	0.8	0.73	0.78	0.87
Efficiency adjusted total	28.79	31.97		60.76	2.43	4.47	6	12.9	73.66
Efficiency adjusted Mean				30.38				4.3	14.73
Efficiency adjusted SE				1.59				1.0341	6.433
Efficiency Adjusted variance				5.0562				3.2079	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
28
Salin:
7
Depth:
23
#Species:
58
Day:
9
Month:
10
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in September 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	46.18	26.4	2.05	74.63	-	1.47	2.11	3.58	78.21
Cichlasoma urophthalmus (>6.5 cm)	33.51	-	-	33.51	-	-	-	0	33.51
Cyprinodon variegatus	-	0.32	0.08	0.4	0.83	1.3	2.94	5.07	5.47
Fundulus confluentus	-	1.73	0.1	1.83	-	-	0.22	0.22	2.05
Lepomis punctatus	2.63	-	-	2.63	-	-	-	0	2.63
Lucania parva	0.47	2	-	2.47	-	-	-	0	2.47
Gerridae spp.	2.11	-	-	2.11	-	-	-	0	2.11
Poecilia latipinna	-	-	1.16	1.16	-	-	-	0	1.16
Gambusia holbrooki	0.12	0.38	0.13	0.63	-	0.04	-	0.04	0.67
Lucania goodeii	-	-	0.09	0.09	-	0.11	-	0.11	0.2
Clarias batrachus	-	-	-	0	-	0.08	-	0.08	0.08
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	85.02	30.83	3.61	119.46	0.83	3	5.27	9.1	128.56
Mean				39.82				3.03	21.43
Net efficiency	0.6	0.85	1	0.82	1	0.8	0.5	0.77	0.79
Efficiency adjusted total	141.7	36.27	3.61	181.58	0.83	3.75	10.54	15.12	196.7
Efficiency adjusted Mean				60.53				5.04	32.78
Efficiency adjusted SE				41.667				2.8763	22.424
Efficiency Adjusted variance				5208.5				24.819	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
31
Salin:
0
Depth:
24
#Species:
58
Day:
6
Month:
10
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in September 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	20.77		-	20.77	-	-	17.69	17.69	38.46
Cichlasoma urophthalmus	22.81		7.22	30.03	4.54	0.26	9.97	14.77	44.79
Cyprinodon variegatus	-		-	0	12.11	1.62	4.59	18.32	18.32
Lucania parva	3.57	Sampled	0.92	4.49	3.08	0.13	3.72	6.93	11.42
Fundulus confluentus	-		-	0	0.36	-	0.44	0.8	0.8
Gambusia holbrooki	0.38		-	0.38	-	-	-	0	0.38
Lucania goodeii	-		0.12	0.12	-	-	-	0	0.12
Gobiosoma robustum	0.09		-	0.09	-	-	-	0	0.09
Adinia xenica	-		-	0	-	-	-	0	0
Ameirus natalis	-		-	0	-	-	-	0	0
Anchoa mitchili	-		-	0	-	-	-	0	0
Belonesox belizanus	-		-	0	-	-	-	0	0
Cichlasoma bimaculatum	-		-	0	-	-	-	0	0
Clarias batrachus	-	Sampled	-	0	-	-	-	0	0
Cynoscion nebulosus	-		-	0	-	-	-	0	0
Elassoma evergladei	-		-	0	-	-	-	0	0
Elops saurus	-		-	0	-	-	-	0	0
Enneacanthus gloriosus	-		-	0	-	-	-	0	0
Erimyzon sucetta	-		-	0	-	-	-	0	0
Floridichthys carpio	-		-	0	-	-	-	0	0
Fundulus chrysotus	-		-	0	-	-	-	0	0
Fundulus grandis	-	Net	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-		-	0	-	-	-	0	0
Fundulus seminolis	-		-	0	-	-	-	0	0
Fundulus similis	-		-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-		-	0	-	-	-	0	0
Gerridae spp.	-		-	0	-	-	-	0	0
Gobiosoma bosci	-		-	0	-	-	-	0	0
Heterandria formosa	-		-	0	-	-	-	0	0
Ictalurus spp.	-		-	0	-	-	-	0	0
Jordanella floridae	-		-	0	-	-	-	0	0
Large Gerridae spp.	-		-	0	-	-	-	0	0
LARVAE	-		-	0	-	-	-	0	0
Lepisosteus platyrhincus	-		-	0	-	-	-	0	0
Lepomis gulosus	-		-	0	-	-	-	0	0
Lepomis macrochirus	-	Not	-	0	-	-	-	0	0
Lepomis marginatus	-		-	0	-	-	-	0	0
Lepomis micolophus	-	Net	-	0	-	-	-	0	0
Lepomis punctatus	-		-	0	-	-	-	0	0
Lepomis spp.	-		-	0	-	-	-	0	0
Lophogobius cyprinoides	-		-	0	-	-	-	0	0
Menidia peninsulae	-		-	0	-	-	-	0	0
Microgobius gulosus	-		-	0	-	-	-	0	0
Micropterus salmoides	-		-	0	-	-	-	0	0
Mugil cephalus	-		-	0	-	-	-	0	0
Notropis sp.	-		-	0	-	-	-	0	0
Noturus gyrinus	-		-	0	-	-	-	0	0
Opsanus beta	-		-	0	-	-	-	0	0
Oreochromis aureus	-		-	0	-	-	-	0	0
Poecilia latipinna	-	Not	-	0	-	-	-	0	0
Pogonias chromis	-		-	0	-	-	-	0	0
Scianops ocellatus	-		-	0	-	-	-	0	0
Sphyraena barracuda	-		-	0	-	-	-	0	0
Strongylura notata	-		-	0	-	-	-	0	0
Syngnathus louisianae	-		-	0	-	-	-	0	0
Syngnathus scovelli	-		-	0	-	-	-	0	0
Tilapia mariae	-		-	0	-	-	-	0	0
Trinectes maculatus	-		-	0	-	-	-	0	0
Total	47.62		8.26	55.88	20.09	2.01	36.41	58.51	114.38
Mean				27.94				19.5	22.88
Net efficiency	0.4	0	1	0.7	0.6	1	1	0.87	0.8
Efficiency adjusted total	119.05		8.26	127.31	33.48	2.01	36.41	71.9	199.21
Efficiency adjusted Mean				63.66				23.97	39.84
Efficiency adjusted SE				55.395				11.011	20.922
Efficiency Adjusted variance				6137.2				363.72	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
30
Salin:
0
Depth:
45
#Species:
58
Day:
22
Month:
9
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in September 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	2.85	1.86	14.35	19.06	11.95	47.54	10.02	69.51	88.58
Cichlasoma urophthalmus (>6.5 cm)	19.01	11.14	13.82	43.97	13.53	34.61	-	48.14	92.11
Poecilia latipinna	-	-	-	0	-	12.35	-	12.35	12.35
Fundulus similis (>6.5 cm)	-	-	-	0	4.9	-	-	4.9	4.9
Lophogobius cyprinoides	1.8	3.25	-	5.05	-	-	-	0	5.05
Lucania parva	-	-	-	0	-	0.42	-	0.42	0.42
Cyprinodon variegatus	-	0.1	0.07	0.17	-	-	-	0	0.17
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	23.66	16.35	28.24	68.25	30.38	94.92	10.02	135.32	203.57
Mean				22.75				45.11	33.93
Net efficiency	0.8	0.8	0.6	0.73	1	0.6	0.95	0.85	0.79
Efficiency adjusted total	29.57	20.44	47.07	97.08	30.38	158.2	10.55	199.13	296.21
Efficiency adjusted Mean				32.36				66.38	49.37
Efficiency adjusted SE				7.813				46.267	22.32
Efficiency Adjusted variance				183.13				6422	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
0
Depth:
27
#Species:
58
Day:
15
Month:
9
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in November 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	0.03	0.24	0.07	0.34	13.79	1.21	5.24	20.24	20.58
Gerridae spp.	41.55	-	-	41.55	-	-	0.59	0.59	42.14
Lucania parva	3.52	2.4	1.73	7.65	1.74	2.16	3.23	7.13	14.78
Poecilia latipinna	-	-	1.24	1.24	2.27	-	3.33	5.6	6.84
Microgobius gulosus	2.16	1.05	0.58	3.79	0.55	0.89	0.11	1.55	5.34
Cichlasoma urophthalmus	3.06	-	2.96	6.02	-	-	-	0	6.02
Floridichthys carpio	-	5.53	-	5.53	-	-	-	0	5.53
Gambusia holbrooki	-	0.05	0.6	0.65	-	-	-	0	0.65
Adinia xenica	-	-	-	0	-	0.08	-	0.08	0.08
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	50.32	9.27	7.18	66.77	18.35	4.35	12.5	35.2	101.96
Mean				22.26				11.73	17
Net efficiency	0.6	0.6	0.87	0.69	0.82	0.8	0.8	0.81	0.75
Efficiency adjusted total	83.87	15.45	8.25	107.57	22.38	5.44	15.62	43.44	151.01
Efficiency adjusted Mean				35.86				14.48	25.17
Efficiency adjusted SE				24.096				4.9233	11.993
Efficiency Adjusted variance				1741.9				72.716	

6	#NETS
3	#DEEP
3	#FLATS
Temp:	
25	
Salin:	
3	
Depth:	
6	
#Species:	
58	
Day:	
20	
Month:	
11	
Year:	
1998	

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in November 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	11.12	1.08	-	12.2	43.79	17.27	1.27	62.33	74.54
Cichlasoma urophthalmus	91.59	25.76	21.96	139.31	0.13	18.41	3.1	21.65	160.95
Poecilia latipinna	8.34	-	-	8.34	-	18.71	8.96	27.67	36.01
Fundulus grandis (>6.5 cm)	-	-	96.51	96.51	-	-	-	0	96.51
Cichlasoma urophthalmus (>6.5 cm)	66.98	-	14.5	81.48	-	-	-	0	81.48
Lepomis spp.	17.66	-	-	17.66	-	-	-	0	17.66
Fundulus confluentus	-	0.86	-	0.86	-	-	2.23	2.23	3.09
Gerridae spp.	-	-	8.71	8.71	-	-	-	0	8.71
Lucania parva	0.85	1.33	0.62	2.8	0.47	0.34	-	0.81	3.61
Adinia xenica	-	-	-	0	-	1.14	-	1.14	1.14
Noturus gyrinus	1.65	-	-	1.65	-	-	-	0	1.65
Lucania goodeii	-	0.09	-	0.09	-	-	-	0	0.09
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	198.19	29.12	142.3	369.61	44.39	55.87	15.56	115.83	485.44
Mean				123.2				38.61	80.91
Net efficiency	1	0.8	0.98	0.93	1	1	1	1	0.96
Efficiency adjusted total	198.19	36.4	145.2	379.79	44.39	55.87	15.56	115.82	495.61
Efficiency adjusted Mean				126.6				38.61	82.6
Efficiency adjusted SE				47.622				11.99	29.486
Efficiency Adjusted variance				6803.6				431.31	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
31
Salin:
0
Depth:
18
#Species:
58
Day:
17
Month:
11
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in November 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	15.88	49.03	4.06	68.97	3.93	1.68	8.02	13.63	82.6
Lucania parva	7.96	2.25	3.45	13.65	1.39	5.05	4.09	10.53	24.18
Cichlasoma urophthalmus (>6.5 cm)	-	86.36	-	86.36	-	-	-	0	86.36
Cyprinodon variegatus	0.44	-	0.42	0.86	1.6	7.55	0.65	9.8	10.67
Lepomis punctatus	12.59	6.86	-	19.45	-	-	-	0	19.45
Belonesox belizanus	-	-	-	0	0.46	-	-	0.46	0.46
Tilapia mariae	1.8	0.26	0.32	2.38	-	-	-	0	2.38
Gerridae spp.	-	-	1.2	1.2	-	-	-	0	1.2
Lucania goodeii	-	-	0.25	0.25	-	-	-	0	0.25
Gobiosoma robustum	-	-	0.13	0.13	-	-	-	0	0.13
Microgobius gulosus	-	-	-	0	-	0.01	-	0.01	0.01
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	38.67	144.76	9.83	193.26	7.38	14.3	12.75	34.44	227.69
Mean				64.42				11.48	37.95
Net efficiency	0.8	0.78	0.98	0.85	1	0.85	0.92	0.92	0.89
Efficiency adjusted total	48.34	185.59	10.03	243.96	7.38	16.82	13.86	38.06	282.02
Efficiency adjusted Mean				81.32				12.69	47
Efficiency adjusted SE				53.295				2.7875	28.375
Efficiency Adjusted variance				8521.1				23.311	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
24
Salin:
0
Depth:
30
#Species:
58
Day:
11
Month:
11
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in November 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	175.78	-	175.78	175.78
Cichlasoma urophthalmus	-	-	11.22	11.22	14.19	34.7	-	48.9	60.12
Poecilia latipinna	-	-	-	0	-	11.03	-	11.03	11.03
Tilapia mariae	2.19	0.25	1.85	4.28	0.24	-	3.44	3.68	7.96
Menidia peninsulae	-	-	2.58	2.58	-	-	-	0	2.58
Cyprinodon variegatus	0.12	-	-	0.12	0.2	-	1.19	1.39	1.51
Jordanella floridae	-	-	-	0	-	-	0.29	0.29	0.29
Microgobius gulosus	-	-	-	0	-	-	0.22	0.22	0.22
Lucania parva	0.27	-	-	0.27	-	-	-	0	0.27
Lucania goodeii	-	0.13	-	0.13	0.11	-	-	0.11	0.24
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	2.58	0.38	15.65	18.61	14.74	221.51	5.14	241.39	260
Mean				6.2				80.46	43.33
Net efficiency	1	0.9	0.6	0.83	0.6	0.4	0.95	0.65	0.74
Efficiency adjusted total	2.58	0.42	26.08	29.08	24.57	553.77	5.41	583.75	612.83
Efficiency adjusted Mean				9.69				194.58	102.14
Efficiency adjusted SE				8.217				179.68	90.441
Efficiency Adjusted variance				202.56				96853	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
42
#Species:
58
Day:
6
Month:
11
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in December 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus		0.38	0.53	0.91	6.74	14.74	0.99	22.47	23.38
Lucania parva	Sampled	4.27	1.42	5.69	0.87	0.26	1.26	2.4	8.08
Gerridae spp.		-	5.75	5.75	0.77	0.74	-	1.51	7.26
Poecilia latipinna	Not	-	-	0	1.52	-	0.59	2.11	2.11
Microgobius gulosus		0.07	0.41	0.48	1.1	-	0.18	1.28	1.76
Cichlasoma urophthalmus		1.34	-	1.34	-	-	-	0	1.34
Adinia xenica		-	-	0	-	-	-	0	0
Ameirus natalis		-	-	0	-	-	-	0	0
Anchoa mitchili		-	-	0	-	-	-	0	0
Belonesox belizanus		-	-	0	-	-	-	0	0
Cichlasoma bimaculatum		-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-	-	0	-	-	-	0	0
Clarias batrachus	Sampled	-	-	0	-	-	-	0	0
Cynoscion nebulosus		-	-	0	-	-	-	0	0
Elassoma evergladei		-	-	0	-	-	-	0	0
Elops saurus		-	-	0	-	-	-	0	0
Enneacanthus gloriosus		-	-	0	-	-	-	0	0
Erimyzon sucetta		-	-	0	-	-	-	0	0
Floridichthys carpio		-	-	0	-	-	-	0	0
Fundulus chrysotus		-	-	0	-	-	-	0	0
Fundulus confluentus		-	-	0	-	-	-	0	0
Fundulus grandis	Net	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)		-	-	0	-	-	-	0	0
Fundulus seminolis		-	-	0	-	-	-	0	0
Fundulus similis		-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0	-	-	-	0	0
Gambusia holbrooki		-	-	0	-	-	-	0	0
Gobiosoma bosci		-	-	0	-	-	-	0	0
Gobiosoma robustum		-	-	0	-	-	-	0	0
Heterandria formosa		-	-	0	-	-	-	0	0
Ictalurus spp.		-	-	0	-	-	-	0	0
Jordanella floridae		-	-	0	-	-	-	0	0
Large Gerridae spp.		-	-	0	-	-	-	0	0
LARVAE		-	-	0	-	-	-	0	0
Lepisosteus platyrhincus		-	-	0	-	-	-	0	0
Lepomis gulosus		-	-	0	-	-	-	0	0
Lepomis macrochirus	Not	-	-	0	-	-	-	0	0
Lepomis marginatus		-	-	0	-	-	-	0	0
Lepomis micolophus	Net	-	-	0	-	-	-	0	0
Lepomis punctatus		-	-	0	-	-	-	0	0
Lepomis spp.		-	-	0	-	-	-	0	0
Lophogobius cyprinoides		-	-	0	-	-	-	0	0
Lucania goodeii		-	-	0	-	-	-	0	0
Menidia peninsulae		-	-	0	-	-	-	0	0
Micropterus salmoides		-	-	0	-	-	-	0	0
Mugil cephalus		-	-	0	-	-	-	0	0
Notropis sp.		-	-	0	-	-	-	0	0
Noturus gyrinus		-	-	0	-	-	-	0	0
Opsanus beta		-	-	0	-	-	-	0	0
Oreochromis aureus		-	-	0	-	-	-	0	0
Pogonias chromis		-	-	0	-	-	-	0	0
Scianops ocellatus		-	-	0	-	-	-	0	0
Sphyraena barracuda		-	-	0	-	-	-	0	0
Strongylura notata		-	-	0	-	-	-	0	0
Syngnathus louisianae		-	-	0	-	-	-	0	0
Syngnathus scovelli		-	-	0	-	-	-	0	0
Tilapia mariae		-	-	0	-	-	-	0	0
Trinectes maculatus		-	-	0	-	-	-	0	0
Total		6.06	8.11	14.17	10.99	15.74	3.03	29.76	43.92
Mean				7.08				9.92	8.79
Net efficiency	0	0.9	0.87	0.88	0.8	0.87	0.6	0.76	0.81
Efficiency adjusted total		6.73	9.32	16.05	13.74	18.09	5.05	36.88	52.93
Efficiency adjusted Mean				8.03				12.29	10.59
Efficiency adjusted SE				1.295				3.8332	2.3809
Efficiency Adjusted variance				3.3541				44.08	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
23
Salin:
1000
Depth:
16
#Species:
58
Day:
21
Month:
12
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in December 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	23.73	6.54	19.09	49.37	12.06	8.93		20.99	70.35
Fundulus confluentus	30.16	4.63	10.61	45.4	2.46	6.01		8.47	53.87
Poecilia latipinna	22.43	1.9	2.68	27.02	0.28	0.9	Not	1.18	28.2
Gambusia holbrooki	8.4	-	0.23	8.63	0.09	0.73		0.82	9.46
Cichlasoma urophthalmus	1.22	2.13	3.21	6.56	-	0.53		0.53	7.09
Adinia xenica	5.24	-	1.54	6.78	0.23	-		0.23	7.01
Belonesox belizanus	-	-	-	0	-	0.21		0.21	0.21
Lucania parva	0.14	0.27	-	0.41	-	-	Sampled	0	0.41
Microgobius gulosus	-	-	0.18	0.18	-	-		0	0.18
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-	Sampled	0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus chrysotus	-	-	-	0	-	-		0	0
Fundulus grandis	-	-	-	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Ictalurus spp.	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepisosteus platyrhincus	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Lucania goodeii	-	-	-	0	-	-		0	0
Menidia peninsulae	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-		0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Syngnathus scovelli	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	91.33	15.47	37.54	144.35	15.12	17.31		32.43	176.78
Mean				48.11				16.22	35.35
Net efficiency	0.6	1	0.98	0.86	1	0.9	0	0.95	0.9
Efficiency adjusted total	152.22	15.47	38.31	206	15.12	19.23		34.35	240.35
Efficiency adjusted Mean				68.67				17.18	48.07
Efficiency adjusted SE				42.294				2.055	26.384
Efficiency Adjusted variance				5366.3				8.4461	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
31
Salin:
1
Depth:
10
#Species:
58
Day:
18
Month:
12
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in December 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	147.36	262.92	38.31	448.59	-	1.93	0.69	2.62	451.21
Cichlasoma urophthalmus (>6.5 cm)	98.86	30.08	73.35	202.29	-	-	-	0	202.29
Poecilia latipinna	4.05	37.71	92.32	134.08	-	-	-	0	134.08
Clarias batrachus	-	52.14	-	52.14	-	-	-	0	52.14
Cyprinodon variegatus	-	2.64	-	2.64	-	5.36	-	5.36	8
Lucania parva	3.3	0.18	0.73	4.21	0.64	1.92	0.23	2.79	7
Fundulus confluentus	-	-	-	0	0.27	2.21	-	2.48	2.48
Tilapia mariae	-	0.5	15.48	15.98	-	-	-	0	15.98
Gerridae spp.	-	-	9.28	9.28	-	-	-	0	9.28
Belonesox belizanus	-	4.88	-	4.88	-	-	-	0	4.88
Lepomis spp.	-	4.35	-	4.35	-	-	-	0	4.35
Gambusia holbrooki	-	1.12	-	1.12	-	-	-	0	1.12
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	253.57	396.52	229.47	879.56	0.91	11.42	0.92	13.26	892.82
Mean				293.19				4.42	148.8
Net efficiency	0.8	0.6	1	0.8	0.9	1	0.9	0.93	0.87
Efficiency adjusted total	316.96	660.87	229.47	1207.3	1.01	11.42	1.02	13.45	1220.8
Efficiency adjusted Mean				402.43				4.48	203.46
Efficiency adjusted SE				131.66				3.4683	106.71
Efficiency Adjusted variance				52006				36.088	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
23
Salin:
0
Depth:
10
#Species:
58
Day:
11
Month:
12
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in December 1998

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	-	4.11	6.84	10.95	12.82	4.09	-	16.92	27.87
Cichlasoma urophthalmus (>6.5 cm)	-	-	24.75	24.75	-	-	-	0	24.75
Tilapia mariae	2.42	5.89	3.64	11.95	-	-	-	0	11.95
Poecilia latipinna	-	-	-	0	-	2.45	5.2	7.65	7.65
Lucania goodeii	0.75	0.45	1.8	3	0.37	-	0.28	0.65	3.65
Cyprinodon variegatus	0.37	-	-	0.37	-	1.69	-	1.69	2.06
Lucania parva	1.65	0.21	-	1.86	-	-	-	0	1.86
Microgobius gulosus	-	0.45	-	0.45	-	-	-	0	0.45
Menidia peninsulae	-	0.04	-	0.04	-	0.06	-	0.06	0.1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	5.19	11.15	37.03	53.37	13.19	8.29	5.48	26.97	80.34
Mean				17.79				8.99	13.39
Net efficiency	0.8	0.9	1	0.9	1	0.8	0.95	0.92	0.91
Efficiency adjusted total	6.49	12.39	37.03	55.91	13.19	10.36	5.77	29.32	85.23
Efficiency adjusted Mean				18.64				9.77	14.21
Efficiency adjusted SE				9.353				2.162	4.7285
Efficiency Adjusted variance				262.44				14.022	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
24
#Species:
58
Day:
8
Month:
12
Year:
1998

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in January 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio	11.1	38.74	241.67	291.51	28.81	6.36	0.68	35.85	327.36
Strongylura notata	114.93	-	8.59	123.52	-	-	-	0	123.52
Lucania parva	0.36	1.46	2	3.81	0.64	0.88	2.29	3.81	7.62
Poecilia latipinna	-	1.59	2.5	4.09	-	0.22	1.04	1.26	5.35
Fundulus grandis (>6.5 cm)	-	-	8.61	8.61	-	-	-	0	8.61
Fundulus grandis	-	-	5.8	5.8	-	-	-	0	5.8
Microgobius gulosus	1.48	-	0.54	2.02	-	0.53	-	0.53	2.55
Gambusia holbrooki	-	-	-	0	-	-	0.19	0.19	0.19
Adinia xenica	-	-	-	0	-	0.17	-	0.17	0.17
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Cyprinodon variegatus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	127.86	41.78	269.71	439.35	29.45	8.16	4.2	41.81	481.16
Mean				146.45				13.94	80.19
Net efficiency	0.4	1	0.87	0.76	0.82	1	0.6	0.81	0.78
Efficiency adjusted total	319.65	41.78	310.01	671.44	35.91	8.16	7	51.07	722.51
Efficiency adjusted Mean				223.81				17.02	120.42
Efficiency adjusted SE				91.059				9.4493	61.76
Efficiency Adjusted variance				24875				267.87	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
21
Salin:
23
Depth:
2
#Species:
58
Day:
30
Month:
1
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in January 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	48.93	9.2	25.37	83.5	35.82	27.18	18.66	81.66	165.15
Fundulus confluentus	18.56	4.33	18.57	41.46	21.04	10.53	9.08	40.65	82.11
Fundulus grandis (>6.5 cm)	-	-	29.25	29.25	-	-	-	0	29.25
Adinia xenica	8.57	0.37	1.01	9.95	0.43	2.31	0.15	2.89	12.84
Poecilia latipinna	9.53	6.12	5.97	21.62	-	-	-	0	21.62
Gambusia holbrooki	17.95	-	0.46	18.41	-	0.17	0.24	0.41	18.82
Fundulus grandis	-	-	5.36	5.36	-	-	-	0	5.36
Jordanella floridae	-	-	-	0	-	-	0.86	0.86	0.86
Fundulus chrysotus	-	-	-	0	-	-	0.26	0.26	0.26
Lucania goodeii	-	-	0.13	0.13	-	-	0.11	0.11	0.24
Lucania parva	0.16	-	-	0.16	-	-	-	0	0.16
Heterandria formosa	-	0.05	-	0.05	-	-	-	0	0.05
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	103.69	20.07	86.12	209.88	57.28	40.19	29.36	126.83	336.72
Mean				69.96				42.28	56.12
Net efficiency	1	0.7	1	0.9	1	1	0.92	0.97	0.94
Efficiency adjusted total	103.69	28.67	86.12	218.48	57.28	40.19	31.91	129.38	347.86
Efficiency adjusted Mean				72.83				43.13	57.98
Efficiency adjusted SE				22.653				7.4694	12.566
Efficiency Adjusted variance				1539.5				167.38	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
30
Salin:
0
Depth:
9
#Species:
58
Day:
27
Month:
1
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in January 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	-	-	0	0.57	24.06	3.95	28.58	28.58
Lepomis spp.	9.03	28.24	-	37.27	-	-	-	0	37.27
Lucania parva	9.72	3.36	-	13.09	-	2.84	0.17	3.01	16.09
Poecilia latipinna	-	25.85	-	25.85	-	0.99	-	0.99	26.84
Cichlasoma urophthalmus	8.7	12.06	-	20.77	-	0.79	-	0.79	21.56
Fundulus confluentus	-	-	-	0	2.19	-	0.77	2.96	2.96
Gambusia holbrooki	2.29	3.24	0.85	6.38	-	1.13	-	1.13	7.51
Cichlasoma urophthalmus (>6.5 cm)	-	11.59	-	11.59	-	-	-	0	11.59
Lucania goodeii	0.6	0.46	1.7	2.76	-	-	0.34	0.34	3.1
Heterandria formosa	0.32	-	0.14	0.46	0.11	0.05	0.07	0.23	0.69
Menidia peninsulae	1.4	-	0.52	1.92	-	-	-	0	1.92
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	32.06	84.8	3.21	120.07	2.87	29.85	5.3	38.03	158.1
Mean				40.02				12.67	26.35
Net efficiency	1	0.9	1	0.97	0.6	1	1	0.87	0.92
Efficiency adjusted total	32.06	94.22	3.21	129.49	4.78	29.85	5.3	39.93	169.42
Efficiency adjusted Mean				43.16				13.31	28.24
Efficiency adjusted SE				26.852				8.2714	14.229
Efficiency Adjusted variance				2163.2				205.25	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
21
Salin:
0
Depth:
15
#Species:
58
Day:
21
Month:
1
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in January 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	137.59	119.98	105.33	362.91	-	2.78	-	2.78	365.69
Cichlasoma urophthalmus (>6.5 cm)	118.7	26.18	152.48	297.36	-	-	-	0	297.36
Lucania goodeii	1.81	3.67	1.11	6.59	0.81	1.39	1.98	4.17	10.76
Lepomis spp.	-	-	8.89	8.89	-	-	-	0	8.89
Cyprinodon variegatus	0.32	-	-	0.32	1.58	0.21	2.49	4.28	4.6
Lucania parva	1.5	0.61	-	2.11	0.69	-	0.83	1.52	3.63
Menidia peninsulae	-	2.46	-	2.46	-	-	-	0	2.46
Lophogobius cyprinoides	2.43	-	-	2.43	-	-	-	0	2.43
Poecilia latipinna	-	-	-	0	-	0.53	0.89	1.42	1.42
Gambusia holbrooki	-	-	-	0	0.61	0.15	0.59	1.35	1.35
Tilapia mariae	-	0.88	-	0.88	-	-	-	0	0.88
Microgobius gulosus	-	0.27	-	0.27	-	-	-	0	0.27
Heterandria formosa	-	-	-	0	0.07	0.03	-	0.1	0.1
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	262.36	154.06	267.81	684.22	3.76	5.09	6.77	15.62	699.84
Mean				228.08				5.21	116.64
Net efficiency	1	1	0.8	0.93	0.9	0.72	1	0.87	0.9
Efficiency adjusted total	262.36	154.06	334.76	751.18	4.18	7.07	6.77	18.02	769.2
Efficiency adjusted Mean				250.39				6.01	128.2
Efficiency adjusted SE				52.506				0.9174	59.479
Efficiency Adjusted variance				8270.5				2.5251	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
20
Salin:
0
Depth:
22
#Species:
58
Day:
16
Month:
1
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in February 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Floridichthys carpio		0.3	-	0.3		20.14	1.35	21.49	21.79
Gerridae spp.		-	21.22	21.22		-	-	0	21.22
Lucania parva	Sampled	1.64	0.11	1.75	Sampled	1.89	2.7	4.59	6.33
Poecilia latipinna	Not	-	3.44	3.44	Not	-	0.8	0.8	4.24
Microgobius gulosus		-	0.45	0.45		-	-	0	0.45
Gambusia holbrooki		0.11	-	0.11		-	-	0	0.11
Adinia xenica		-	-	0		-	-	0	0
Ameirus natalis		-	-	0		-	-	0	0
Anchoa mitchili		-	-	0		-	-	0	0
Belonesox belizanus		-	-	0		-	-	0	0
Cichlasoma bimaculatum		-	-	0		-	-	0	0
Cichlasoma urophthalmus		-	-	0		-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-	-	0		-	-	0	0
Clarias batrachus	Sampled	-	-	0	Sampled	-	-	0	0
Cynoscion nebulosus		-	-	0		-	-	0	0
Cyprinodon variegatus		-	-	0		-	-	0	0
Elassoma evergladei		-	-	0		-	-	0	0
Elops saurus		-	-	0		-	-	0	0
Enneacanthus gloriosus		-	-	0		-	-	0	0
Erimyzon sucetta		-	-	0		-	-	0	0
Fundulus chrysotus		-	-	0		-	-	0	0
Fundulus confluentus		-	-	0		-	-	0	0
Fundulus grandis	Net	-	-	0	Net	-	-	0	0
Fundulus grandis (>6.5 cm)		-	-	0		-	-	0	0
Fundulus seminolis		-	-	0		-	-	0	0
Fundulus similis		-	-	0		-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0		-	-	0	0
Gobiosoma bosci		-	-	0		-	-	0	0
Gobiosoma robustum		-	-	0		-	-	0	0
Heterandria formosa		-	-	0		-	-	0	0
Ictalurus spp.		-	-	0		-	-	0	0
Jordanella floridae		-	-	0		-	-	0	0
Large Gerridae spp.		-	-	0		-	-	0	0
LARVAE		-	-	0		-	-	0	0
Lepisosteus platyrhincus		-	-	0		-	-	0	0
Lepomis gulosus		-	-	0		-	-	0	0
Lepomis macrochirus	Not	-	-	0	Not	-	-	0	0
Lepomis marginatus		-	-	0		-	-	0	0
Lepomis micolophus	Net	-	-	0	Net	-	-	0	0
Lepomis punctatus		-	-	0		-	-	0	0
Lepomis spp.		-	-	0		-	-	0	0
Lophogobius cyprinoides		-	-	0		-	-	0	0
Lucania goodeii		-	-	0		-	-	0	0
Menidia peninsulae		-	-	0		-	-	0	0
Micropterus salmoides		-	-	0		-	-	0	0
Mugil cephalus		-	-	0		-	-	0	0
Notropis sp.		-	-	0		-	-	0	0
Noturus gyrinus		-	-	0		-	-	0	0
Opsanus beta		-	-	0		-	-	0	0
Oreochromis aureus		-	-	0		-	-	0	0
Pogonias chromis		-	-	0		-	-	0	0
Scianops ocellatus		-	-	0		-	-	0	0
Sphyraena barracuda		-	-	0		-	-	0	0
Strongylura notata		-	-	0		-	-	0	0
Syngnathus louisianae		-	-	0		-	-	0	0
Syngnathus scovelli		-	-	0		-	-	0	0
Tilapia mariae		-	-	0		-	-	0	0
Trinectes maculatus		-	-	0		-	-	0	0
Total		2.04	25.21	27.26		22.03	4.84	26.88	54.13
Mean				13.63				13.44	13.53
Net efficiency	0	0.8	0.87	0.84	0	0.92	1	0.96	0.9
Efficiency adjusted total		2.55	28.98	31.53		23.95	4.84	28.79	60.32
Efficiency adjusted Mean				15.77				14.4	15.08
Efficiency adjusted SE				13.215				9.555	6.6692
Efficiency Adjusted variance				349.27				182.6	

4 #NETS
2 #DEEP
2 #FLATS

Temp:
20
Salin:
1000
Depth:
20
#Species:
58
Day:
3
Month:
3
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in February 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	54.56	16.6	8	79.16	31.19	13.53	1.37	46.09	125.25
Fundulus confluentus	8.29	5.41	3	16.69	2.3	3.46	-	5.76	22.45
Poecilia latipinna	18.79	19.92	2.59	41.3	0.34	-	-	0.34	41.64
Fundulus grandis (>6.5 cm)	10.67	-	-	10.67	-	-	-	0	10.67
Adinia xenica	-	-	-	0	0.31	0.99	-	1.3	1.3
Gambusia holbrooki	2.1	0.87	0.47	3.44	-	0.6	-	0.6	4.04
Lucania parva	0.72	0.38	0.67	1.77	-	-	0.04	0.04	1.81
Lucania goodeii	-	-	0.18	0.18	-	-	-	0	0.18
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Microgobius gulosus	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	95.13	43.18	14.9	153.22	34.14	18.58	1.41	54.13	207.34
Mean				51.07				18.04	34.56
Net efficiency	0.9	1	1	0.97	1	1	0.9	0.97	0.97
Efficiency adjusted total	105.7	43.18	14.9	163.78	34.14	18.58	1.57	54.29	218.07
Efficiency adjusted Mean				54.59				18.1	36.34
Efficiency adjusted SE				26.826				9.4053	15.107
Efficiency Adjusted variance				2158.9				265.38	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
19
Salin:
10
Depth:
18
#Species:
58
Day:
1
Month:
3
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in February 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-	-	0.68	0.68	0.41	14.47	0.58	15.46	16.13
Poecilia latipinna	-	86.19	-	86.19	-	-	-	0	86.19
Lucania parva	16.83	9.72	2.12	28.66	1.04	4.61	0.75	6.41	35.07
Lepomis punctatus	3.19	15.75	-	18.94	-	-	-	0	18.94
Microgobius gulosus	0.53	-	-	0.53	-	2.14	-	2.14	2.67
Gambusia holbrooki	0.72	0.21	1.07	2	0.01	0.06	1.79	1.86	3.86
Fundulus confluentus	-	-	-	0	0.66	1.22	-	1.87	1.87
Jordanella floridae	-	-	-	0	-	1.27	0.32	1.59	1.59
Cichlasoma urophthalmus (>6.5 cm)	11.59	-	-	11.59	-	-	-	0	11.59
Cichlasoma urophthalmus	6.89	4.1	-	10.99	-	-	-	0	10.99
Lucania goodeii	0.73	1.55	1.4	3.68	-	0.51	0.07	0.58	4.26
Heterandria formosa	0.04	0.43	0.06	0.53	0.06	0.09	0.06	0.21	0.75
Fundulus similis	-	-	-	0	-	0.19	-	0.19	0.19
Belonesox belizanus	-	1	-	1	-	-	-	0	1
Lepomis spp.	0.59	-	-	0.59	-	-	-	0	0.59
Menidia peninsulae	-	-	0.24	0.24	-	-	-	0	0.24
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus glriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	41.1	118.95	5.57	165.62	2.18	24.55	3.57	30.3	195.92
Mean				55.21				10.1	32.65
Net efficiency	0.8	0.8	1	0.87	0.8	1	0.9	0.9	0.88
Efficiency adjusted total	51.37	148.69	5.57	205.63	2.72	24.55	3.97	31.24	236.87
Efficiency adjusted Mean				68.54				10.41	39.48
Efficiency adjusted SE				42.198				7.0775	23.132
Efficiency Adjusted variance				5342				150.27	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
16
Salin:
15
Depth:
15
#Species:
58
Day:
26
Month:
2
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in February 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	159.98	104.84	86.45	351.27	-	-	-	0	351.27
Cichlasoma urophthalmus (>6.5 cm)	142.39	-	111.01	253.4	-	-	-	0	253.4
Lepomis spp.	13.28	11.06	6.04	30.38	-	-	-	0	30.38
Poecilia latipinna	14.47	-	4.29	18.76	-	-	-	0	18.76
Lucania goodeii	0.26	5.74	2.62	8.62	4.15	0.78	1.12	6.06	14.68
Lepomis punctatus	-	-	13.87	13.87	-	-	-	0	13.87
Cyprinodon variegatus	-	-	-	0	9.72	0.02	0.13	9.87	9.87
Noturus gyrinus	-	-	11.06	11.06	-	-	-	0	11.06
Jordanella floridae	-	4.46	-	4.46	2.47	-	0.81	3.27	7.73
Microgobius gulosus	0.82	2.86	0.89	4.57	-	-	-	0	4.57
Lucania parva	1.26	1.37	0.63	3.26	-	-	-	0	3.26
Heterandria formosa	0.04	-	0.1	0.14	2.19	0.11	-	2.3	2.44
Fundulus confluentus	-	-	-	0	0.53	-	1.7	2.23	2.23
Tilapia mariae	-	-	1.88	1.88	-	-	-	0	1.88
Menidia peninsulae	1.4	-	-	1.4	-	-	0.18	0.18	1.58
Gambusia holbrooki	-	-	-	0	0.38	0.15	-	0.53	0.53
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	333.9	130.33	238.84	703.07	19.44	1.06	3.94	24.44	727.51
Mean				234.36				8.15	121.25
Net efficiency	0.9	0.9	1	0.93	1	0.9	0.9	0.93	0.93
Efficiency adjusted total	371	144.81	238.84	754.65	19.44	1.18	4.38	25	779.65
Efficiency adjusted Mean				251.55				8.33	129.94
Efficiency adjusted SE				65.604				5.6296	61.845
Efficiency Adjusted variance				12912				95.079	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
22
Salin:
0
Depth:
16
#Species:
58
Day:
18
Month:
2
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in March 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	54.94		26.02	80.96	11.09	97.35		108.45	189.4
Fundulus confluentus	-		-	0	2.98	22.52		25.5	25.5
Lucania parva	9.51	Sampled	2.29	11.8	0.6	1.8	Sampled	2.4	14.2
Poecilia latipinna	7.1	Not	4.06	11.16	0.3	1.43	Not	1.73	12.89
Adinia xenica	-		-	0	1.98	-		1.98	1.98
Fundulus grandis (>6.5 cm)	-		5.88	5.88	-	-		0	5.88
Gerridae spp.	-		5.16	5.16	-	-		0	5.16
Gambusia holbrooki	-		-	0	0.22	0.23		0.45	0.45
Ameirus natalis	-		-	0	-	-		0	0
Anchoa mitchili	-		-	0	-	-		0	0
Belonesox belizanus	-		-	0	-	-		0	0
Cichlasoma bimaculatum	-		-	0	-	-		0	0
Cichlasoma urophthalmus	-		-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-		-	0	-	-		0	0
Clarias batrachus	-	Sampled	-	0	-	-	Sampled	0	0
Cynoscion nebulosus	-		-	0	-	-		0	0
Elassoma evergladei	-		-	0	-	-		0	0
Elops saurus	-		-	0	-	-		0	0
Enneacanthus gloriosus	-		-	0	-	-		0	0
Erimyzon sucetta	-		-	0	-	-		0	0
Floridichthys carpio	-		-	0	-	-		0	0
Fundulus chrysotus	-		-	0	-	-		0	0
Fundulus grandis	-	Net	-	0	-	-	Net	0	0
Fundulus seminolis	-		-	0	-	-		0	0
Fundulus similis	-		-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-		-	0	-	-		0	0
Gobiosoma bosci	-		-	0	-	-		0	0
Gobiosoma robustum	-		-	0	-	-		0	0
Heterandria formosa	-		-	0	-	-		0	0
Ictalurus spp.	-		-	0	-	-		0	0
Jordanella floridae	-		-	0	-	-		0	0
Large Gerridae spp.	-		-	0	-	-		0	0
LARVAE	-		-	0	-	-		0	0
Lepisosteus platyrhincus	-		-	0	-	-		0	0
Lepomis gulosus	-		-	0	-	-		0	0
Lepomis macrochirus	-	Not	-	0	-	-	Not	0	0
Lepomis marginatus	-		-	0	-	-		0	0
Lepomis micolophus	-	Net	-	0	-	-	Net	0	0
Lepomis punctatus	-		-	0	-	-		0	0
Lepomis spp.	-		-	0	-	-		0	0
Lophogobius cyprinoides	-		-	0	-	-		0	0
Lucania goodeii	-		-	0	-	-		0	0
Menidia peninsulae	-		-	0	-	-		0	0
Microgobius gulosus	-		-	0	-	-		0	0
Micropterus salmoides	-		-	0	-	-		0	0
Mugil cephalus	-		-	0	-	-		0	0
Notropis sp.	-		-	0	-	-		0	0
Noturus gyrinus	-		-	0	-	-		0	0
Opsanus beta	-		-	0	-	-		0	0
Oreochromis aureus	-		-	0	-	-		0	0
Pogonias chromis	-		-	0	-	-		0	0
Scianops ocellatus	-		-	0	-	-		0	0
Sphyraena barracuda	-		-	0	-	-		0	0
Strongylura notata	-		-	0	-	-		0	0
Syngnathus louisianae	-		-	0	-	-		0	0
Syngnathus scovelli	-		-	0	-	-		0	0
Tilapia mariae	-		-	0	-	-		0	0
Trinectes maculatus	-		-	0	-	-		0	0
Total	71.55		43.41	114.96	17.18	123.34		140.51	255.47
Mean				57.48				70.26	63.87
Net efficiency	0.8	0	0.87	0.84	0.8	0.92	0	0.86	0.85
Efficiency adjusted total	89.44		49.9	139.34	21.47	134.07		155.54	294.88
Efficiency adjusted Mean				69.67				77.77	73.72
Efficiency adjusted SE				19.77				56.3	24.472
Efficiency Adjusted variance				781.71				6339.4	

4 #NETS
2 #DEEP
2 #FLATS

Temp:
20
Salin:
37
Depth:
4
#Species:
58
Day:
30
Month:
3
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in March 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	69.34	4.99	58.24	132.57				0	132.57
Fundulus confluentus	89.06	19.01	24.46	132.53				0	132.53
Adinia xenica	21.09	-	31.34	52.43				0	52.43
Poecilia latipinna	7.7	-	-	7.7	Dry	Dry	Dry	0	7.7
Gambusia holbrooki	2.23	0.97	0.2	3.39				0	3.39
Jordanella floridae	0.98	-	0.37	1.35				0	1.35
Ameirus natalis	-	-	-	0				0	0
Anchoa mitchili	-	-	-	0				0	0
Belonesox belizanus	-	-	-	0				0	0
Cichlasoma bimaculatum	-	-	-	0				0	0
Cichlasoma urophthalmus	-	-	-	0				0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0				0	0
Clarias batrachus	-	-	-	0	Dry	Dry	Dry	0	0
Cynoscion nebulosus	-	-	-	0				0	0
Elassoma evergladei	-	-	-	0				0	0
Elops saurus	-	-	-	0				0	0
Enneacanthus gloriosus	-	-	-	0				0	0
Erimyzon sucetta	-	-	-	0				0	0
Floridichthys carpio	-	-	-	0				0	0
Fundulus chrysotus	-	-	-	0				0	0
Fundulus grandis	-	-	-	0	Net	Net	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0				0	0
Fundulus seminolis	-	-	-	0				0	0
Fundulus similis	-	-	-	0				0	0
Fundulus similis (>6.5 cm)	-	-	-	0				0	0
Gerridae spp.	-	-	-	0				0	0
Gobiosoma bosci	-	-	-	0				0	0
Gobiosoma robustum	-	-	-	0				0	0
Heterandria formosa	-	-	-	0				0	0
Ictalurus spp.	-	-	-	0				0	0
Large Gerridae spp.	-	-	-	0				0	0
LARVAE	-	-	-	0				0	0
Lepisosteus platyrhincus	-	-	-	0				0	0
Lepomis gulosus	-	-	-	0				0	0
Lepomis macrochirus	-	-	-	0	Net	Net	Net	0	0
Lepomis marginatus	-	-	-	0				0	0
Lepomis micolophus	-	-	-	0				0	0
Lepomis punctatus	-	-	-	0				0	0
Lepomis spp.	-	-	-	0				0	0
Lophogobius cyprinoides	-	-	-	0				0	0
Lucania goodeii	-	-	-	0				0	0
Lucania parva	-	-	-	0				0	0
Menidia peninsulae	-	-	-	0				0	0
Microgobius gulosus	-	-	-	0				0	0
Micropterus salmoides	-	-	-	0				0	0
Mugil cephalus	-	-	-	0				0	0
Notropis sp.	-	-	-	0				0	0
Noturus gyrinus	-	-	-	0				0	0
Opsanus beta	-	-	-	0				0	0
Oreochromis aureus	-	-	-	0				0	0
Pogonias chromis	-	-	-	0				0	0
Scianops ocellatus	-	-	-	0				0	0
Sphyraena barracuda	-	-	-	0				0	0
Strongylura notata	-	-	-	0				0	0
Syngnathus louisianae	-	-	-	0				0	0
Syngnathus scovelli	-	-	-	0				0	0
Tilapia mariae	-	-	-	0				0	0
Trinectes maculatus	-	-	-	0				0	0
Total	190.39	24.97	114.6	329.97				0	329.97
Mean				109.99					109.99
Net efficiency	0.85	1	0.9	0.92	0	0	0		0.92
Efficiency adjusted total	223.99	24.97	127.33	376.29					376.29
Efficiency adjusted Mean				125.43					125.43
Efficiency adjusted SE				57.46					57.46
Efficiency Adjusted variance				9904.9				0	

3	#NETS
3	#DEEP
0	#FLATS
Temp:	
23	
Salin:	
17	
Depth:	
-2	
#Species:	
58	
Day:	
26	
Month:	
3	
Year:	
1999	

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in March 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	-		1.77	1.77		24.17	2.53	26.7	28.47
Fundulus confluentus	5.33		-	5.33		5.53	3.89	9.43	14.76
Poecilia latipinna	57.63	Not	0.97	58.6	Not	-	-	0	58.6
Gambusia holbrooki	10.97		7.1	18.07		3.18	1.47	4.64	22.71
Lucania parva	20.44	Sampled	3.65	24.08	Sampled	-	0.93	0.93	25.01
Lucania goodeii	0.64		0.83	1.47		0.06	0.31	0.37	1.84
Cichlasoma urophthalmus	4.1		-	4.1		-	-	0	4.1
Heterandria formosa	0.72		0.31	1.03		0.08	-	0.08	1.11
Menidia peninsulae	0.24		0.05	0.29		-	-	0	0.29
Adinia xenica	-		-	0		-	-	0	0
Ameirus natalis	-		-	0		-	-	0	0
Anchoa mitchili	-		-	0		-	-	0	0
Belonesox belizanus	-		-	0		-	-	0	0
Cichlasoma bimaculatum	-		-	0		-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-		-	0		-	-	0	0
Clarias batrachus	-	Sampled	-	0	Sampled	-	-	0	0
Cynoscion nebulosus	-		-	0		-	-	0	0
Elassoma evergladei	-		-	0		-	-	0	0
Elops saurus	-		-	0		-	-	0	0
Enneacanthus gloriosus	-		-	0		-	-	0	0
Erimyzon sucetta	-		-	0		-	-	0	0
Floridichthys carpio	-		-	0		-	-	0	0
Fundulus chrysotus	-		-	0		-	-	0	0
Fundulus grandis	-	Net	-	0	Net	-	-	0	0
Fundulus grandis (>6.5 cm)	-		-	0		-	-	0	0
Fundulus seminolis	-		-	0		-	-	0	0
Fundulus similis	-		-	0		-	-	0	0
Fundulus similis (>6.5 cm)	-		-	0		-	-	0	0
Gerridae spp.	-		-	0		-	-	0	0
Gobiosoma bosci	-		-	0		-	-	0	0
Gobiosoma robustum	-		-	0		-	-	0	0
Ictalurus spp.	-		-	0		-	-	0	0
Jordanella floridae	-		-	0		-	-	0	0
Large Gerridae spp.	-		-	0		-	-	0	0
LARVAE	-		-	0		-	-	0	0
Lepisosteus platyrhincus	-		-	0		-	-	0	0
Lepomis gulosus	-		-	0		-	-	0	0
Lepomis macrochirus	-	Not	-	0	Not	-	-	0	0
Lepomis marginatus	-		-	0		-	-	0	0
Lepomis micolophus	-	Net	-	0	Net	-	-	0	0
Lepomis punctatus	-		-	0		-	-	0	0
Lepomis spp.	-		-	0		-	-	0	0
Lophogobius cyprinoides	-		-	0		-	-	0	0
Microgobius gulosus	-		-	0		-	-	0	0
Micropterus salmoides	-		-	0		-	-	0	0
Mugil cephalus	-		-	0		-	-	0	0
Notropis sp.	-		-	0		-	-	0	0
Noturus gyrinus	-		-	0		-	-	0	0
Opsanus beta	-		-	0		-	-	0	0
Oreochromis aureus	-		-	0		-	-	0	0
Pogonias chromis	-		-	0		-	-	0	0
Scianops ocellatus	-		-	0		-	-	0	0
Sphyraena barracuda	-		-	0		-	-	0	0
Strongylura notata	-		-	0		-	-	0	0
Syngnathus louisianae	-		-	0		-	-	0	0
Syngnathus scovelli	-		-	0		-	-	0	0
Tilapia mariae	-		-	0		-	-	0	0
Trinectes maculatus	-		-	0		-	-	0	0
Total	100.07		14.67	114.74		33.02	9.13	42.14	156.88
Mean				57.37				21.08	39.22
Net efficiency	0.75	0	0.8	0.78	0	0.7	0.5	0.6	0.69
Efficiency adjusted total	133.43		18.34	151.77		47.17	18.26	65.43	217.2
Efficiency adjusted Mean				75.89				32.72	54.3
Efficiency adjusted SE				57.545				14.455	27.24
Efficiency Adjusted variance				6622.9				417.89	

4 #NETS
2 #DEEP
2 #FLATS

Temp:
20
Salin:
21
Depth:
11
#Species:
58
Day:
23
Month:
3
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in March 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	318.3	105.06	111.06	534.42	-		-	0	534.42
Cichlasoma urophthalmus (>6.5 cm)	286.45	27.06	108.44	421.95	-		-	0	421.95
Lucania goodeii	3.53	12.8	4.63	20.96	1.07		0.08	1.15	22.11
Lepomis marginatus	5.13	-	17.73	22.86	-		-	0	22.86
Poecilia latipinna	8.04	3.31	7.45	18.8	1.5	Not	-	1.5	20.3
Lucania parva	6.73	8.19	1.47	16.39	-	Sampled	0.29	0.29	16.69
Fundulus confluentus	-	-	-	0	7.91		-	7.91	7.91
Cyprinodon variegatus	1.56	-	0.78	2.34	3.39		0.1	3.49	5.83
Jordanella floridae	-	-	-	0	2.86		1.54	4.39	4.39
Enneacanthus gloriosus	-	3.52	-	3.52	-		-	0	3.52
Gambusia holbrooki	-	-	-	0	1.79		-	1.79	1.79
Heterandria formosa	-	0.09	0.37	0.46	0.98		0.04	1.02	1.48
Menidia peninsulae	-	0.76	-	0.76	-		-	0	0.76
Microgobius gulosus	-	0.38	-	0.38	-		-	0	0.38
Adinia xenica	-	-	-	0	-		-	0	0
Ameirus natalis	-	-	-	0	-		-	0	0
Anchoa mitchili	-	-	-	0	-		-	0	0
Belonesox belizanus	-	-	-	0	-		-	0	0
Cichlasoma bimaculatum	-	-	-	0	-		-	0	0
Clarias batrachus	-	-	-	0	-	Sampled	-	0	0
Cynoscion nebulosus	-	-	-	0	-		-	0	0
Elassoma evergladei	-	-	-	0	-		-	0	0
Elops saurus	-	-	-	0	-		-	0	0
Erimyzon sucetta	-	-	-	0	-		-	0	0
Floridichthys carpio	-	-	-	0	-		-	0	0
Fundulus chrysotus	-	-	-	0	-		-	0	0
Fundulus grandis	-	-	-	0	-	Net	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-		-	0	0
Fundulus seminolis	-	-	-	0	-		-	0	0
Fundulus similis	-	-	-	0	-		-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-		-	0	0
Gerridae spp.	-	-	-	0	-		-	0	0
Gobiosoma bosci	-	-	-	0	-		-	0	0
Gobiosoma robustum	-	-	-	0	-		-	0	0
Ictalurus spp.	-	-	-	0	-		-	0	0
Large Gerridae spp.	-	-	-	0	-		-	0	0
LARVAE	-	-	-	0	-		-	0	0
Lepisosteus platyrhincus	-	-	-	0	-		-	0	0
Lepomis gulosus	-	-	-	0	-		-	0	0
Lepomis macrochirus	-	-	-	0	-	Not	-	0	0
Lepomis micolophus	-	-	-	0	-	Net	-	0	0
Lepomis punctatus	-	-	-	0	-		-	0	0
Lepomis spp.	-	-	-	0	-		-	0	0
Lophogobius cyprinoides	-	-	-	0	-		-	0	0
Micropterus salmoides	-	-	-	0	-		-	0	0
Mugil cephalus	-	-	-	0	-		-	0	0
Notropis sp.	-	-	-	0	-		-	0	0
Noturus gyrinus	-	-	-	0	-		-	0	0
Opsanus beta	-	-	-	0	-		-	0	0
Oreochromis aureus	-	-	-	0	-		-	0	0
Pogonias chromis	-	-	-	0	-		-	0	0
Scianops ocellatus	-	-	-	0	-		-	0	0
Sphyraena barracuda	-	-	-	0	-		-	0	0
Strongylura notata	-	-	-	0	-		-	0	0
Syngnathus louisianae	-	-	-	0	-		-	0	0
Syngnathus scovelli	-	-	-	0	-		-	0	0
Tilapia mariae	-	-	-	0	-		-	0	0
Trinectes maculatus	-	-	-	0	-		-	0	0
Total	629.74	161.17	251.92	1042.8	19.49		2.05	21.54	1064.4
Mean				347.61				10.77	212.87
Net efficiency	0.9	1	1	0.97	0.8	0	0.9	0.85	0.92
Efficiency adjusted total	699.71	161.17	251.92	1112.8	24.36		2.28	26.64	1139.4
Efficiency adjusted Mean				370.93				13.32	227.89
Efficiency adjusted SE				166.46				11.04	126.48
Efficiency Adjusted variance				83129				243.76	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
20
Salin:
7
Depth:
15
#Species:
58
Day:
18
Month:
3
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in April 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	1.58	5.89		7.47	6.96	0.36		7.32	14.79
Lucania parva	8.5	5.58	Sampled	14.09	0.64	2.27	Sampled	2.91	17
Gerridae spp.	-	3.98		3.98	0.86	-		0.86	4.84
Microgobius gulosus	2.22	0.49		2.72	-	-		0	2.72
Menidia peninsulae	0.69	2.02		2.71	-	-		0	2.71
Poecilia latipinna	-	1.04	Not	1.04	-	-	Not	0	1.04
Floridichthys carpio	-	0.85		0.85	-	-		0	0.85
Gambusia holbrooki	0.44	-		0.44	-	-		0	0.44
Strongylura notata	-	-		0	-	0.01		0.01	0.01
Adinia xenica	-	-		0	-	-		0	0
Ameirus natalis	-	-		0	-	-		0	0
Anchoa mitchili	-	-		0	-	-		0	0
Belonesox belizanus	-	-		0	-	-		0	0
Cichlasoma bimaculatum	-	-		0	-	-		0	0
Cichlasoma urophthalmus	-	-		0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-		0	-	-		0	0
Clarias batrachus	-	-	Sampled	0	-	-	Sampled	0	0
Cynoscion nebulosus	-	-		0	-	-		0	0
Elassoma evergladei	-	-		0	-	-		0	0
Elops saurus	-	-		0	-	-		0	0
Enneacanthus gloriosus	-	-		0	-	-		0	0
Erimyzon sucetta	-	-		0	-	-		0	0
Fundulus chrysotus	-	-		0	-	-		0	0
Fundulus confluentus	-	-		0	-	-		0	0
Fundulus grandis	-	-	Net	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-		0	-	-		0	0
Fundulus seminolis	-	-		0	-	-		0	0
Fundulus similis	-	-		0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-		0	-	-		0	0
Gobiosoma bosci	-	-		0	-	-		0	0
Gobiosoma robustum	-	-		0	-	-		0	0
Heterandria formosa	-	-		0	-	-		0	0
Ictalurus spp.	-	-		0	-	-		0	0
Jordanella floridae	-	-		0	-	-		0	0
Large Gerridae spp.	-	-		0	-	-		0	0
LARVAE	-	-		0	-	-		0	0
Lepisosteus platyrhincus	-	-		0	-	-		0	0
Lepomis gulosus	-	-		0	-	-		0	0
Lepomis macrochirus	-	-	Not	0	-	-	Not	0	0
Lepomis marginatus	-	-		0	-	-		0	0
Lepomis micolophus	-	-	Net	0	-	-	Net	0	0
Lepomis punctatus	-	-		0	-	-		0	0
Lepomis spp.	-	-		0	-	-		0	0
Lophogobius cyprinoides	-	-		0	-	-		0	0
Lucania goodeii	-	-		0	-	-		0	0
Micropterus salmoides	-	-		0	-	-		0	0
Mugil cephalus	-	-		0	-	-		0	0
Notropis sp.	-	-		0	-	-		0	0
Noturus gyrinus	-	-		0	-	-		0	0
Opsanus beta	-	-		0	-	-		0	0
Oreochromis aureus	-	-		0	-	-		0	0
Pogonias chromis	-	-		0	-	-		0	0
Scianops ocellatus	-	-		0	-	-		0	0
Sphyraena barracuda	-	-		0	-	-		0	0
Syngnathus louisianae	-	-		0	-	-		0	0
Syngnathus scovelli	-	-		0	-	-		0	0
Tilapia mariae	-	-		0	-	-		0	0
Trinectes maculatus	-	-		0	-	-		0	0
Total	13.43	19.86		33.29	8.46	2.64		11.1	44.39
Mean				16.65				5.55	11.1
Net efficiency	0.78	0.9	0	0.84	0.6	1	0	0.8	0.82
Efficiency adjusted total	17.22	22.07		39.29	14.1	2.64		16.74	56.03
Efficiency adjusted Mean				19.65				8.37	14.01
Efficiency adjusted SE				2.425				5.73	4.1287
Efficiency Adjusted variance				11.761				65.666	

4 #NETS
2 #DEEP
2 #FLATS

Temp:
25
Salin:
36
Depth:
19
#Species:
58
Day:
30
Month:
4
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in April 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	10.25	14.7	6	30.95	12.5	21.44		33.94	64.89
Fundulus confluentus	12.11	20.84	6.44	39.39	6.02	11.66		17.68	57.07
Poecilia latipinna	2.26	1.56	13.4	17.22	10.14	6.55	Not	16.69	33.91
Adinia xenica	-	0.7	-	0.7	-	2.07		2.07	2.77
Lucania parva	5.12	6.57	2.66	14.35	0.18	0.31	Sampled	0.49	14.84
Gambusia holbrooki	1.54	0.26	0.93	2.73	-	0.81		0.81	3.54
Strongylura notata	-	-	0.78	0.78	-	-		0	0.78
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-	Sampled	0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus chrysotus	-	-	-	0	-	-		0	0
Fundulus grandis	-	-	-	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gerridae spp.	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Ictalurus spp.	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepisosteus platyrhincus	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Lucania goodeii	-	-	-	0	-	-		0	0
Menidia peninsulae	-	-	-	0	-	-		0	0
Microgobius gulosus	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-		0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Syngnathus scovelli	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	31.28	44.63	30.21	106.12	28.84	42.84		71.68	177.8
Mean				35.37				35.84	35.56
Net efficiency	0.8	1	1	0.93	1	1	0	1	0.96
Efficiency adjusted total	39.1	44.63	30.21	113.94	28.84	42.84		71.68	185.62
Efficiency adjusted Mean				37.98				35.84	37.12
Efficiency adjusted SE				4.2002				7	3.2353
Efficiency Adjusted variance				52.925				98	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
27
Salin:
31
Depth:
11
#Species:
58
Day:
26
Month:
4
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in April 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus		6.19	5.9	12.09		12.12	3.65	15.77	27.86
Lucania parva	Sampled	27.16	31.54	58.7	Sampled	0.23	0.76	0.99	59.69
Fundulus confluentus		50.54	9.27	59.81		0.28	0.19	0.46	60.28
Gambusia holbrooki		7.79	3.21	11		0.53	3.19	3.73	14.73
Poecilia latipinna	Not	16.21	9.43	25.64	Not	-	-	0	25.64
Menidia peninsulae		-	18.52	18.52		-	-	0	18.52
Cichlasoma urophthalmus		4.17	-	4.17		-	-	0	4.17
Belonesox belizanus		1.94	-	1.94		-	-	0	1.94
Jordanella floridae		0.67	-	0.67		-	-	0	0.67
Heterandria formosa		-	-	0		-	0.07	0.07	0.07
Adinia xenica		-	-	0		-	-	0	0
Ameirus natalis		-	-	0		-	-	0	0
Anchoa mitchili		-	-	0		-	-	0	0
Cichlasoma bimaculatum		-	-	0		-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-	-	0		-	-	0	0
Clarias batrachus	Sampled	-	-	0	Sampled	-	-	0	0
Cynoscion nebulosus		-	-	0		-	-	0	0
Elassoma evergladei		-	-	0		-	-	0	0
Elops saurus		-	-	0		-	-	0	0
Enneacanthus gloriosus		-	-	0		-	-	0	0
Erimyzon sucetta		-	-	0		-	-	0	0
Floridichthys carpio		-	-	0		-	-	0	0
Fundulus chrysotus		-	-	0		-	-	0	0
Fundulus grandis	Net	-	-	0	Net	-	-	0	0
Fundulus grandis (>6.5 cm)		-	-	0		-	-	0	0
Fundulus seminolis		-	-	0		-	-	0	0
Fundulus similis		-	-	0		-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0		-	-	0	0
Gerridae spp.		-	-	0		-	-	0	0
Gobiosoma bosci		-	-	0		-	-	0	0
Gobiosoma robustum		-	-	0		-	-	0	0
Ictalurus spp.		-	-	0		-	-	0	0
Large Gerridae spp.		-	-	0		-	-	0	0
LARVAE		-	-	0		-	-	0	0
Lepisosteus platyrhincus		-	-	0		-	-	0	0
Lepomis gulosus		-	-	0		-	-	0	0
Lepomis macrochirus	Not	-	-	0	Not	-	-	0	0
Lepomis marginatus		-	-	0		-	-	0	0
Lepomis micolophus	Net	-	-	0	Net	-	-	0	0
Lepomis punctatus		-	-	0		-	-	0	0
Lepomis spp.		-	-	0		-	-	0	0
Lophogobius cyprinoides		-	-	0		-	-	0	0
Lucania goodeii		-	-	0		-	-	0	0
Microgobius gulosus		-	-	0		-	-	0	0
Micropterus salmoides		-	-	0		-	-	0	0
Mugil cephalus		-	-	0		-	-	0	0
Notropis sp.		-	-	0		-	-	0	0
Noturus gyrinus		-	-	0		-	-	0	0
Opsanus beta		-	-	0		-	-	0	0
Oreochromis aureus		-	-	0		-	-	0	0
Pogonias chromis		-	-	0		-	-	0	0
Scianops ocellatus		-	-	0		-	-	0	0
Sphyraena barracuda		-	-	0		-	-	0	0
Strongylura notata		-	-	0		-	-	0	0
Syngnathus louisianae		-	-	0		-	-	0	0
Syngnathus scovelli		-	-	0		-	-	0	0
Tilapia mariae		-	-	0		-	-	0	0
Trinectes maculatus		-	-	0		-	-	0	0
Total		114.67	77.87	192.55		13.16	7.86	21.02	213.57
Mean				96.27				10.51	53.39
Net efficiency	0	1	0.9	0.95	0	0.9	0.6	0.75	0.85
Efficiency adjusted total		114.67	86.52	201.19		14.62	13.1	27.72	228.91
Efficiency adjusted Mean				100.6				13.86	57.23
Efficiency adjusted SE				14.075				0.76	25.691
Efficiency Adjusted variance				396.21				1.1552	

4 #NETS
2 #DEEP
2 #FLATS

Temp:
21
Salin:
30
Depth:
8
#Species:
58
Day:
21
Month:
4
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in April 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	187.62	228.91	-	416.53	-	-	-	0	416.53
Tilapia mariae	-	-	95.54	95.54	2.58	-	-	2.58	98.12
Cichlasoma urophthalmus	16.3	26.88	44.71	87.89	-	-	-	0	87.89
Fundulus confluentus	-	-	-	0	17.57	4.54	15.13	37.24	37.24
Lucania parva	6.2	0.67	2.29	9.16	0.68	1.74	0.55	2.97	12.14
Gambusia holbrooki	2.34	5.1	2.68	10.12	1.63	-	0.25	1.88	12
Cyprinodon variegatus	0.29	-	1.02	1.31	3.95	0.3	2.46	6.71	8.02
Microgobius gulosus	3.94	4.19	0.51	8.63	-	-	-	0	8.63
Menidia peninsulae	3.71	-	1.47	5.18	-	-	-	0	5.18
Jordanella floridae	-	-	-	0	2.94	0.71	0.32	3.97	3.97
Lucania goodeii	2.39	0.65	-	3.03	-	-	-	0	3.03
Poecilia latipinna	-	-	0.49	0.49	0.99	-	0.14	1.13	1.62
Heterandria formosa	0.85	-	0.64	1.49	-	0.06	-	0.06	1.55
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	223.64	266.4	149.34	639.38	30.34	7.35	18.85	56.54	695.92
Mean				213.13				18.85	115.99
Net efficiency	0.9	0.95	0.6	0.82	1	0.72	0.9	0.87	0.84
Efficiency adjusted total	248.49	280.42	248.9	777.81	30.34	10.21	20.94	61.49	839.3
Efficiency adjusted Mean				259.27				20.5	139.88
Efficiency adjusted SE				10.576				5.8153	53.663
Efficiency Adjusted variance				335.53				101.45	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
25
Depth:
12
#Species:
58
Day:
16
Month:
4
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in June 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus		15.23	4.53	19.77	13.8	5.96	40.74	60.51	80.27
Gerridae spp.		2.79	2.35	5.13	3.82	1.74	7.98	13.55	18.68
Lucania parva	Sampled	7.07	5.12	12.19	0.38	2.02	3.4	5.81	17.99
Poecilia latipinna	Not	12.9	9.92	22.82	-	-	-	0	22.82
Microgobius gulosus		4.13	4.44	8.57	1.92	1.42	1.03	4.37	12.94
Gambusia holbrooki		-	1.41	1.41	-	0.08	-	0.08	1.49
Opsanus beta		-	0.94	0.94	-	-	-	0	0.94
Fundulus confluentus		0.24	-	0.24	-	-	-	0	0.24
Adinia xenica		0.1	-	0.1	-	-	-	0	0.1
Ameirus natalis		-	-	0	-	-	-	0	0
Anchoa mitchili		-	-	0	-	-	-	0	0
Belonesox belizanus		-	-	0	-	-	-	0	0
Cichlasoma bimaculatum		-	-	0	-	-	-	0	0
Cichlasoma urophthalmus		-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-	-	0	-	-	-	0	0
Clarias batrachus	Sampled	-	-	0	-	-	-	0	0
Cynoscion nebulosus		-	-	0	-	-	-	0	0
Elassoma evergladei		-	-	0	-	-	-	0	0
Elops saurus		-	-	0	-	-	-	0	0
Enneacanthus gloriosus		-	-	0	-	-	-	0	0
Erimyzon sucetta		-	-	0	-	-	-	0	0
Floridichthys carpio		-	-	0	-	-	-	0	0
Fundulus chrysotus		-	-	0	-	-	-	0	0
Fundulus grandis	Net	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)		-	-	0	-	-	-	0	0
Fundulus seminolis		-	-	0	-	-	-	0	0
Fundulus similis		-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0	-	-	-	0	0
Gobiosoma bosci		-	-	0	-	-	-	0	0
Gobiosoma robustum		-	-	0	-	-	-	0	0
Heterandria formosa		-	-	0	-	-	-	0	0
Ictalurus spp.		-	-	0	-	-	-	0	0
Jordanella floridae		-	-	0	-	-	-	0	0
Large Gerridae spp.		-	-	0	-	-	-	0	0
LARVAE		-	-	0	-	-	-	0	0
Lepisosteus platyrhincus		-	-	0	-	-	-	0	0
Lepomis gulosus		-	-	0	-	-	-	0	0
Lepomis macrochirus	Not	-	-	0	-	-	-	0	0
Lepomis marginatus		-	-	0	-	-	-	0	0
Lepomis micolophus	Net	-	-	0	-	-	-	0	0
Lepomis punctatus		-	-	0	-	-	-	0	0
Lepomis spp.		-	-	0	-	-	-	0	0
Lophogobius cyprinoides		-	-	0	-	-	-	0	0
Lucania goodeii		-	-	0	-	-	-	0	0
Menidia peninsulae		-	-	0	-	-	-	0	0
Micropterus salmoides		-	-	0	-	-	-	0	0
Mugil cephalus		-	-	0	-	-	-	0	0
Notropis sp.		-	-	0	-	-	-	0	0
Noturus gyrinus		-	-	0	-	-	-	0	0
Oreochromis aureus		-	-	0	-	-	-	0	0
Pogonias chromis		-	-	0	-	-	-	0	0
Scianops ocellatus		-	-	0	-	-	-	0	0
Sphyraena barracuda		-	-	0	-	-	-	0	0
Strongylura notata		-	-	0	-	-	-	0	0
Syngnathus louisianae		-	-	0	-	-	-	0	0
Syngnathus scovelli		-	-	0	-	-	-	0	0
Tilapia mariae		-	-	0	-	-	-	0	0
Trinectes maculatus		-	-	0	-	-	-	0	0
Total		42.46	28.71	71.17	19.93	11.22	53.16	84.3	155.47
Mean				35.59				28.1	31.1
Net efficiency	0	0.8	0.87	0.84	1	0.93	1	0.98	0.92
Efficiency adjusted total		53.07	33	86.07	19.93	12.06	53.16	85.15	171.22
Efficiency adjusted Mean				43.03				28.38	34.24
Efficiency adjusted SE				10.035				12.595	8.3988
Efficiency Adjusted variance				201.4				475.9	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
28
Salin:
29
Depth:
15
#Species:
58
Day:
29
Month:
7
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in June 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	5.49	1.84	29.97	37.3	12.67	29.85	42.32	84.84	122.15
Fundulus confluentus	-	1.73	-	1.73	-	-	7.63	7.63	9.36
Poecilia latipinna	6.23	0.62	-	6.85	-	3.45	2.66	6.11	12.96
Lucania parva	5.1	4.97	1.31	11.38	-	2.4	1.41	3.82	15.19
Gerridae spp.	-	-	-	0	-	1.17	-	1.17	1.17
Microgobius gulosus	2.67	0.89	-	3.56	0.3	-	-	0.3	3.86
Menidia peninsulae	-	-	-	0	-	0.55	-	0.55	0.55
Cichlasoma urophthalmus	0.57	-	0.33	0.9	-	-	-	0	0.9
Gambusia holbrooki	0.2	-	-	0.2	-	-	-	0	0.2
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	20.26	10.05	31.61	61.92	12.97	37.42	54.03	104.42	166.34
Mean				20.64				34.81	27.72
Net efficiency	1	0.8	1	0.93	1	0.8	1	0.93	0.93
Efficiency adjusted total	20.26	12.56	31.61	64.43	12.97	46.77	54.03	113.77	178.2
Efficiency adjusted Mean				21.48				37.92	29.7
Efficiency adjusted SE				5.5328				12.651	7.1874
Efficiency Adjusted variance				91.836				480.18	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
27
Salin:
4
Depth:
19
#Species:
58
Day:
15
Month:
7
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in June 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus	0.6	1.6	0.68	2.88	1.59	12.92		14.51	17.39
Cichlasoma urophthalmus (>6.5 cm)	-	139.7	-	139.7	-	-		0	139.7
Lucania parva	10.04	8.83	3.35	22.22	3.96	0.86	Sampled	4.81	27.03
Fundulus grandis	-	-	-	0	-	6.01	Net	6.01	6.01
Trinectes maculatus	33.65	-	-	33.65	-	-		0	33.65
Poecilia latipinna	-	-	-	0	-	2.24	Not	2.24	2.24
Gerridae spp.	-	-	2.08	2.08	-	1.67		1.67	3.75
Fundulus confluentus	-	0.66	-	0.66	1.55	-		1.55	2.21
Menidia peninsulae	-	-	-	0	-	0.43		0.43	0.43
Adinia xenica	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Cichlasoma urophthalmus	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-	Sampled	0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus chrysotus	-	-	-	0	-	-		0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gambusia holbrooki	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Ictalurus spp.	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepisosteus platyrhincus	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Lucania goodeii	-	-	-	0	-	-		0	0
Microgobius gulosus	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-		0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Syngnathus scovelli	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Total	44.29	150.79	6.11	201.19	7.09	24.13		31.22	232.41
Mean				67.06				15.61	46.48
Net efficiency	0.78	0.8	1	0.86	0.4	1	0	0.7	0.8
Efficiency adjusted total	56.78	188.49	6.11	251.38	17.72	24.13		41.85	293.23
Efficiency adjusted Mean				83.79				20.93	58.65
Efficiency adjusted SE				54.353				3.205	33.533
Efficiency Adjusted variance				8862.9				20.544	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
33
Salin:
0
Depth:
18
#Species:
58
Day:
22
Month:
7
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in June 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	-	-	39.1	39.1	-	-	12.58	12.58	51.68
Cyprinodon variegatus	5.67	1.59	3.88	11.15	11.73	0.5	7.94	20.17	31.32
Lucania parva	3.85	7.62	5	16.47	1.47	2.66	1.49	5.62	22.09
Microgobius gulosus	3.91	7.05	2.05	13	3.25	0.85	1.81	5.9	18.91
Poecilia latipinna	0.52	11.51	2.6	14.63	-	1.11	-	1.11	15.75
Menidia peninsulae	0.61	-	7.22	7.83	6.43	-	-	6.43	14.26
Lophogobius cyprinoides	1.12	2.9	9.47	13.49	-	-	-	0	13.49
Fundulus confluentus	-	-	-	0	-	1.29	2.77	4.06	4.06
Cichlasoma urophthalmus	-	-	-	0	-	3.67	-	3.67	3.67
Gambusia holbrooki	0.62	-	-	0.62	-	-	-	0	0.62
Belonesox belizanus	-	-	-	0	-	0.22	-	0.22	0.22
LARVAE	0.06	-	-	0.06	-	-	-	0	0.06
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Strongylura notata	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	16.36	30.67	69.31	116.35	22.88	10.3	26.59	59.77	176.12
Mean				38.78				19.92	29.35
Net efficiency	0.92	0.95	0.5	0.79	1	0.5	0.9	0.8	0.79
Efficiency adjusted total	17.78	32.28	138.62	188.68	22.88	20.6	29.54	73.02	261.7
Efficiency adjusted Mean				62.89				24.34	43.62
Efficiency adjusted SE				38.094				2.682	19.131
Efficiency Adjusted variance				4353.5				21.58	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
29
Salin:
1
Depth:
32
#Species:
58
Day:
7
Month:
7
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at BS in September 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Gerridae spp.	-	-	-	0	10.6	-	3.43	14.03	14.03
Lucania parva	1.14	2.96	1.06	5.15	0.71	0.99	1.23	2.93	8.08
Cyprinodon variegatus	-	0.24	0.21	0.45	0.51	0.19	1.19	1.89	2.34
Microgobius gulosus	0.64	-	0.21	0.85	0.69	0.31	0.72	1.72	2.57
Strongylura notata	-	-	7.93	7.93	-	-	-	0	7.93
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus	-	-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus confluentus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gambusia holbrooki	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lophogobius cyprinoides	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Menidia peninsulae	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Poecilia latipinna	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	1.78	3.2	9.41	14.39	12.51	1.49	6.57	20.56	34.95
Mean				4.8				6.86	5.83
Net efficiency	0.78	0.87	0.6	0.75	0.82	0.6	0.77	0.73	0.74
Efficiency adjusted total	2.28	3.68	15.68	21.64	15.26	2.48	8.53	26.27	47.91
Efficiency adjusted Mean				7.21				8.76	7.98
Efficiency adjusted SE				4.2526				3.691	2.5418
Efficiency Adjusted variance				54.253				40.871	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
26
Salin:
7
Depth:
37
#Species:
58
Day:
7
Month:
10
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at HC in September 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cyprinodon variegatus		8.11	4.22	12.33	5.24	2.83	2.08	10.15	22.47
Fundulus confluentus		2.92	-	2.92	-	-	-	0	2.92
Lucania parva	Sampled	0.82	0.61	1.43	-	0.21	0.08	0.29	1.72
Cichlasoma urophthalmus		1.39	-	1.39	-	-	-	0	1.39
Adinia xenica		-	-	0	-	-	-	0	0
Ameirus natalis		-	-	0	-	-	-	0	0
Anchoa mitchili		-	-	0	-	-	-	0	0
Belonesox belizanus		-	-	0	-	-	-	0	0
Cichlasoma bimaculatum		-	-	0	-	-	-	0	0
Cichlasoma urophthalmus (>6.5 cm)		-	-	0	-	-	-	0	0
Clarias batrachus	Sampled	-	-	0	-	-	-	0	0
Cynoscion nebulosus		-	-	0	-	-	-	0	0
Elassoma evergladei		-	-	0	-	-	-	0	0
Elops saurus		-	-	0	-	-	-	0	0
Enneacanthus gloriosus		-	-	0	-	-	-	0	0
Erimyzon sucetta		-	-	0	-	-	-	0	0
Floridichthys carpio		-	-	0	-	-	-	0	0
Fundulus chrysotus		-	-	0	-	-	-	0	0
Fundulus grandis	Net	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)		-	-	0	-	-	-	0	0
Fundulus seminolis		-	-	0	-	-	-	0	0
Fundulus similis		-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)		-	-	0	-	-	-	0	0
Gambusia holbrooki		-	-	0	-	-	-	0	0
Gerridae spp.		-	-	0	-	-	-	0	0
Gobiosoma bosci		-	-	0	-	-	-	0	0
Gobiosoma robustum		-	-	0	-	-	-	0	0
Heterandria formosa		-	-	0	-	-	-	0	0
Ictalurus spp.		-	-	0	-	-	-	0	0
Jordanella floridae		-	-	0	-	-	-	0	0
Large Gerridae spp.		-	-	0	-	-	-	0	0
LARVAE		-	-	0	-	-	-	0	0
Lepisosteus platyrhincus		-	-	0	-	-	-	0	0
Lepomis gulosus		-	-	0	-	-	-	0	0
Lepomis macrochirus	Not	-	-	0	-	-	-	0	0
Lepomis marginatus		-	-	0	-	-	-	0	0
Lepomis micolophus	Net	-	-	0	-	-	-	0	0
Lepomis punctatus		-	-	0	-	-	-	0	0
Lepomis spp.		-	-	0	-	-	-	0	0
Lophogobius cyprinoides		-	-	0	-	-	-	0	0
Lucania goodeii		-	-	0	-	-	-	0	0
Menidia peninsulae		-	-	0	-	-	-	0	0
Microgobius gulosus		-	-	0	-	-	-	0	0
Micropterus salmoides		-	-	0	-	-	-	0	0
Mugil cephalus		-	-	0	-	-	-	0	0
Notropis sp.		-	-	0	-	-	-	0	0
Noturus gyrinus		-	-	0	-	-	-	0	0
Opsanus beta		-	-	0	-	-	-	0	0
Oreochromis aureus		-	-	0	-	-	-	0	0
Poecilia latipinna	Not	-	-	0	-	-	-	0	0
Pogonias chromis		-	-	0	-	-	-	0	0
Scianops ocellatus		-	-	0	-	-	-	0	0
Sphyraena barracuda		-	-	0	-	-	-	0	0
Strongylura notata		-	-	0	-	-	-	0	0
Syngnathus louisianae		-	-	0	-	-	-	0	0
Syngnathus scovelli		-	-	0	-	-	-	0	0
Tilapia mariae		-	-	0	-	-	-	0	0
Trinectes maculatus		-	-	0	-	-	-	0	0
Total		13.24	4.83	18.07	5.24	3.04	2.16	10.44	28.5
Mean				9.04				3.48	5.7
Net efficiency	0	0.92	0.98	0.95	1	0.95	0.4	0.78	0.85
Efficiency adjusted total		14.39	4.93	19.32	5.24	3.2	5.4	13.84	33.16
Efficiency adjusted Mean				9.66				4.61	6.63
Efficiency adjusted SE				4.73				0.7082	1.9789
Efficiency Adjusted variance				44.746				1.5046	

5 #NETS
2 #DEEP
3 #FLATS

Temp:
27
Salin:
0
Depth:
34
#Species:
58
Day:
30
Month:
9
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at JB in September 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus (>6.5 cm)	-	-	-	0	41.48	-		41.48	41.48
Cyprinodon variegatus	0.08	-	0.83	0.91	26.7	7.61		34.31	35.22
Lucania parva	6.89	4.08	3.42	14.38	3.86	1.11	Sampled	4.97	19.36
Gerridae spp.	-	-	-	0	-	1.37		1.37	1.37
Fundulus confluentus	-	2.08	-	2.08	-	-		0	2.08
Cichlasoma urophthalmus	0.2	0.83	-	1.03	-	-		0	1.03
Adinia xenica	-	-	-	0	-	-		0	0
Ameirus natalis	-	-	-	0	-	-		0	0
Anchoa mitchili	-	-	-	0	-	-		0	0
Belonesox belizanus	-	-	-	0	-	-		0	0
Cichlasoma bimaculatum	-	-	-	0	-	-		0	0
Clarias batrachus	-	-	-	0	-	-	Sampled	0	0
Cynoscion nebulosus	-	-	-	0	-	-		0	0
Elassoma evergladei	-	-	-	0	-	-		0	0
Elops saurus	-	-	-	0	-	-		0	0
Enneacanthus gloriosus	-	-	-	0	-	-		0	0
Erimyzon sucetta	-	-	-	0	-	-		0	0
Floridichthys carpio	-	-	-	0	-	-		0	0
Fundulus chrysotus	-	-	-	0	-	-		0	0
Fundulus grandis	-	-	-	0	-	-	Net	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-		0	0
Fundulus seminolis	-	-	-	0	-	-		0	0
Fundulus similis	-	-	-	0	-	-		0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-		0	0
Gambusia holbrooki	-	-	-	0	-	-		0	0
Gobiosoma bosci	-	-	-	0	-	-		0	0
Gobiosoma robustum	-	-	-	0	-	-		0	0
Heterandria formosa	-	-	-	0	-	-		0	0
Ictalurus spp.	-	-	-	0	-	-		0	0
Jordanella floridae	-	-	-	0	-	-		0	0
Large Gerridae spp.	-	-	-	0	-	-		0	0
LARVAE	-	-	-	0	-	-		0	0
Lepisosteus platyrhincus	-	-	-	0	-	-		0	0
Lepomis gulosus	-	-	-	0	-	-		0	0
Lepomis macrochirus	-	-	-	0	-	-	Not	0	0
Lepomis marginatus	-	-	-	0	-	-		0	0
Lepomis micolophus	-	-	-	0	-	-	Net	0	0
Lepomis punctatus	-	-	-	0	-	-		0	0
Lepomis spp.	-	-	-	0	-	-		0	0
Lophogobius cyprinoides	-	-	-	0	-	-		0	0
Lucania goodeii	-	-	-	0	-	-		0	0
Menidia peninsulae	-	-	-	0	-	-		0	0
Microgobius gulosus	-	-	-	0	-	-		0	0
Micropterus salmoides	-	-	-	0	-	-		0	0
Mugil cephalus	-	-	-	0	-	-		0	0
Notropis sp.	-	-	-	0	-	-		0	0
Noturus gyrinus	-	-	-	0	-	-		0	0
Opsanus beta	-	-	-	0	-	-		0	0
Oreochromis aureus	-	-	-	0	-	-		0	0
Poecilia latipinna	-	-	-	0	-	-	Not	0	0
Pogonias chromis	-	-	-	0	-	-		0	0
Scianops ocellatus	-	-	-	0	-	-		0	0
Sphyraena barracuda	-	-	-	0	-	-		0	0
Strongylura notata	-	-	-	0	-	-		0	0
Syngnathus louisianae	-	-	-	0	-	-		0	0
Syngnathus scovelli	-	-	-	0	-	-		0	0
Tilapia mariae	-	-	-	0	-	-		0	0
Trinectes maculatus	-	-	-	0	-	-		0	0
Total	7.17	6.99	4.25	18.4	72.04	10.09		82.13	100.53
Mean				6.14				41.07	20.11
Net efficiency	0.78	0.8	0.95	0.84	0.72	0.93	0	0.83	0.84
Efficiency adjusted total	9.19	8.74	4.47	22.4	100.06	10.85		110.91	133.31
Efficiency adjusted Mean				7.47				55.45	26.66
Efficiency adjusted SE				1.504				44.605	18.38
Efficiency Adjusted variance				6.7856				3979.2	

5 #NETS
3 #DEEP
2 #FLATS

Temp:
28
Salin:
3
Depth:
48
#Species:
58
Day:
18
Month:
9
Year:
1999

Biomass of fish collected by species, summary statistics and physical parameters collected at TR in September 1999

Species	NET 4	NET 5	NET 6	DEEP	NET 10	NET 11	NET 12	FLATS	TOTAL
Cichlasoma urophthalmus	5.34	1.16	6.77	13.26	10.65	13.68	0.37	24.71	37.97
Cichlasoma urophthalmus (>6.5 cm)	11.19	-	-	11.19	-	-	-	0	11.19
Strongylura notata	-	-	-	0	8.43	-	-	8.43	8.43
Lucania parva	1.32	3.9	2.14	7.36	1.45	-	0.45	1.9	9.26
Microgobius gulosus	3.74	2.73	0.37	6.84	0.23	-	1.63	1.86	8.7
Poecilia latipinna	-	1.68	-	1.68	5.77	-	-	5.77	7.45
Lophogobius cyprinoides	4.21	3.29	0.65	8.15	-	-	-	0	8.15
Cyprinodon variegatus	2.08	-	0.31	2.38	-	0.04	1.59	1.63	4.01
Menidia peninsulae	-	-	1.09	1.09	-	-	-	0	1.09
Fundulus confluentus	-	-	-	0	-	0.6	-	0.6	0.6
Gambusia holbrooki	-	-	-	0	-	0.35	-	0.35	0.35
Adinia xenica	-	-	-	0	-	-	-	0	0
Ameirus natalis	-	-	-	0	-	-	-	0	0
Anchoa mitchili	-	-	-	0	-	-	-	0	0
Belonesox belizanus	-	-	-	0	-	-	-	0	0
Cichlasoma bimaculatum	-	-	-	0	-	-	-	0	0
Clarias batrachus	-	-	-	0	-	-	-	0	0
Cynoscion nebulosus	-	-	-	0	-	-	-	0	0
Elassoma evergladei	-	-	-	0	-	-	-	0	0
Elops saurus	-	-	-	0	-	-	-	0	0
Enneacanthus gloriosus	-	-	-	0	-	-	-	0	0
Erimyzon sucetta	-	-	-	0	-	-	-	0	0
Floridichthys carpio	-	-	-	0	-	-	-	0	0
Fundulus chrysotus	-	-	-	0	-	-	-	0	0
Fundulus grandis	-	-	-	0	-	-	-	0	0
Fundulus grandis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Fundulus seminolis	-	-	-	0	-	-	-	0	0
Fundulus similis	-	-	-	0	-	-	-	0	0
Fundulus similis (>6.5 cm)	-	-	-	0	-	-	-	0	0
Gerridae spp.	-	-	-	0	-	-	-	0	0
Gobiosoma bosci	-	-	-	0	-	-	-	0	0
Gobiosoma robustum	-	-	-	0	-	-	-	0	0
Heterandria formosa	-	-	-	0	-	-	-	0	0
Ictalurus spp.	-	-	-	0	-	-	-	0	0
Jordanella floridae	-	-	-	0	-	-	-	0	0
Large Gerridae spp.	-	-	-	0	-	-	-	0	0
LARVAE	-	-	-	0	-	-	-	0	0
Lepisosteus platyrhincus	-	-	-	0	-	-	-	0	0
Lepomis gulosus	-	-	-	0	-	-	-	0	0
Lepomis macrochirus	-	-	-	0	-	-	-	0	0
Lepomis marginatus	-	-	-	0	-	-	-	0	0
Lepomis micolophus	-	-	-	0	-	-	-	0	0
Lepomis punctatus	-	-	-	0	-	-	-	0	0
Lepomis spp.	-	-	-	0	-	-	-	0	0
Lucania goodeii	-	-	-	0	-	-	-	0	0
Micropterus salmoides	-	-	-	0	-	-	-	0	0
Mugil cephalus	-	-	-	0	-	-	-	0	0
Notropis sp.	-	-	-	0	-	-	-	0	0
Noturus gyrinus	-	-	-	0	-	-	-	0	0
Opsanus beta	-	-	-	0	-	-	-	0	0
Oreochromis aureus	-	-	-	0	-	-	-	0	0
Pogonias chromis	-	-	-	0	-	-	-	0	0
Scianops ocellatus	-	-	-	0	-	-	-	0	0
Sphyraena barracuda	-	-	-	0	-	-	-	0	0
Syngnathus louisianae	-	-	-	0	-	-	-	0	0
Syngnathus scovelli	-	-	-	0	-	-	-	0	0
Tilapia mariae	-	-	-	0	-	-	-	0	0
Trinectes maculatus	-	-	-	0	-	-	-	0	0
Total	27.87	12.75	11.32	51.95	26.54	14.67	4.03	45.24	97.19
Mean				17.31				15.08	16.2
Net efficiency	0.92	0.95	0.82	0.9	0.95	0.7	0.9	0.85	0.87
Efficiency adjusted total	30.29	13.42	13.8	57.51	27.94	20.96	4.48	53.38	110.89
Efficiency adjusted Mean				19.17				17.79	18.48
Efficiency adjusted SE				5.5611				6.9549	3.9943
Efficiency Adjusted variance				92.777				145.11	

6 #NETS
3 #DEEP
3 #FLATS

Temp:
28
Salin:
2
Depth:
41
#Species:
58
Day:
9
Month:
9
Year:
1999

Editorial Note: Appendix A has been previously published and should be referenced by the following citation. Reprints are available from the first author.

Lorenz, J.J. 1999. The Response of Fishes to Physicochemical Changes in the Mangroves of Northeast Florida Bay. Estuaries 22(2B):500-517.

Appendix D. The Response of Fishes to Physicoc h emical Changes in the Mangroves of Northeast Florida Bay

ABSTRACT

Historically, large volumes of freshwater from the Everglades reached Florida Bay in the form of overland sheet flow. South Florida's extensive canal system has diverted freshwater from its historic course, resulting in shorter hydroperiods and higher salinities. Presumably, these physical changes had an impact on the biota of the system. The mixing zone between the freshwater Everglades and euryhaline Florida Bay is primarily characterized as a dwarf red mangrove forest. The small, demersal fishes found in this habitat are an important food source for a variety of predators and are excellent bio-indicators for both short-term and long-term perturbations in the system. I examine the effect of fluctuating water level, salinity, and temperature on this fish community in order to better understand the impact of water diversion on the ecotone. Fishes were collected at 4 sites within the ecotone over a 5 yr period using a $9m^2$ drop-trap. Principal Components Analysis was used to generate 10 composite variables (PC's) from a temporal array of 59 physicochemical variables. These composite variables were used in regression analyses to evaluate spatial and temporal changes in the fish community. Regression analysis indicated that fish density was significantly related to short term and long term changes in water level and with long term temperature variation (R^2= 0.50). ANOVA of density between sites supports the regression results, indicating that sites with longer hydroperiod had higher density than shorter hydroperiod sites. The impact of changes in density on biomass was reflected by regression analysis which indicated that increased water level and decreased variability in depth were correlated with higher biomass (R^2= 0.61). However, biomass was also influenced by changes in the salinity regime, presumably through increases in individual fish body size or through a shift in the community toward heavier bodied fish species. ANOVA of biomass between sites indicates that sites with longer freshwater periods had higher biomass than sites with shorter freshwater periods. The first two axis of a Detrended Correspondence Analysis

on community biomass explained 59.2 % of the variance in the community and supported the hypothesis that salinity was a primary determinant of community structure. These results indicate that historic changes in water delivery could have altered the mangrove fish community, thereby lowering prey availability for higher trophic levels.

INTRODUCTION

Historically, large volumes of freshwater from the Everglades reached Florida Bay via sheet flow through Taylor Slough (Figure D.1). Since 1960, historic flow patterns have been altered by the construction and operation of a series of canals known as the South Dade Conveyance System (SDCS). The SDCS was designed, in part, to supply the eastern Everglades and Florida Bay with appropriate water deliveries from upstream sources (Light and Dineen 1994; U. S. Army Corps of Engineers 1994). In contrast to the original design, the SDCS has functioned primarily as a flood control system that ultimately drained that part of the Everglades which it was designed to support (U. S. Army Corps of Engineers 1994). Many researchers have concluded that the resulting reduction in freshwater flow from the Everglades is at least partially responsible for recent ecological changes in Florida Bay (Boesch et al. 1993). Furthermore, Loftus and Eklund (1994) suggest that canal operation has disrupted the natural pattern of water quantity, flow, and hydroperiod in the Everglades resulting in reduced abundance of demersal marsh fishes. Bancroft et al. (1994) indicate that a decline in the available prey base may account for observed reduction in Everglades wading bird populations. Similar impacts may be occurring in Florida Bay and associated wetlands due to construction and operation of the SDCS.

Hydrologic models indicate that the amount of water flowing through the Everglades toward Florida Bay has been greatly reduced compared to historic flows (Fennema et al. 1994). A consequence of water diversion is that less freshwater reaches the mangrove zone and Florida Bay (McIvor et al. 1994). McIvor et al. (1994) developed a model of historic salinities for the euryhaline area between the fresh water Everglades and salt water Florida Bay. The model indicated that since construction of the SDCS, marine conditions have occurred more frequently and that brackish and marine periods have been longer in duration than in the pre-canal period. Meeder et al. (1996) used paleo-ecological techniques to demonstrate that the marine environment had intruded into the historically freshwater wetlands north of Florida Bay at a rate faster than could be accounted for by sea level rise. They also showed that changes in the rate of

marine intrusion were correlated with the construction and changes in operation of the SDCS. Ross et al. (in press) performed vegetation surveys between the C-111 canal (the southern most canal in the SDCS) and Florida Bay and compared the results to similar surveys of the same area performed by Egler in 1948 (Egler 1952). The comparisons indicated that the mangrove dominated area has expanded inland by as much as 3.3 km since the 1948 study, supplanting historic freshwater sawgrass marshes. Cumulatively, these studies indicate that the wetlands north of Florida Bay have experienced higher salinities, longer periods of saline intrusion and shorter hydroperiods due to anthropogenic manipulation of water resources than would happen in a non-managed system.

To date, only a few studies have been initiated that directly link water deliveries to the changes in the fauna of Florida Bay. The underlying hypothesis of the research presented here was that alterations in the resident fish fauna would have almost certainly occurred along with the historic changes in hydrology and vegetation. Unfortunately, historical data is unavailable to substantiate this hypothesis. Therefore, an alternative strategy was adopted that examined the impact of fluctuations in physicochemical variables (i.e., salinity, water level and temperature) on the demersal mangrove fish community so as to better understand the implications of historical anthropogenic changes in these parameters on these ecologically important animals.

The community of demersal euryhaline fishes is an excellent subject for studies relating physical conditions to the biota for several reasons. Most of these fishes are considered to be annual fishes (Loftus and Kushlan 1987), so comparisons from year to year are unencumbered by year classes as in many other fisheries studies. Several species have generation periods as short as of 60 d (Foster 1967; Haake and Dean 1983). As a result of their high reproductive and mortality rates, the demersal fish community responds very quickly to changes in hydrology. Unlike larger fish species, birds and reptiles, many of these fish cannot leave the system when adverse conditions arise and then return when conditions improve making them better indicators of short term perturbations (e.g. Frederick and Loftus 1993). Furthermore, through trophic stages, top predators such as piscivorous fishes, alligators, crocodiles, and birds (especially wading birds of the order Ciconiiformes), are directly or indirectly dependent on these small fishes. If past changes in water delivery to the mixing zone can be linked to a negative impact on this prey base, it may help explain the imperiled state of many of these animal populations in the Florida Bay area.

Study Location

Browder and Moore (1981) proposed that secondary production in the estuarine mixing zone is a function of the degree overlap between the stationary habitat (e.g. substrate type, vegetation, etc.) and the dynamic habitat (e.g. hydrology and hydrography). When comparing fish communities from multiple locations, observed differences in the community could be due to differences in the stationary habitat, dynamic habitat or both. The focus of this study was the impact that anthropogenic changes to the dynamic habitat (specifically hydroperiod and salinity regimes) had on the fish community. To effectively accomplish this, sites were selected that had similar stationary habitat but different in these key aspects of the dynamic habitat.

Stationary habitat

The four sampling sites (Figure D.1) were located in similar dwarf mangrove habitat and each was characterized by a deep central creek (creek microhabitat) surrounded by shallow flats (flats microhabitat) that became seasonally exposed. The percentage of sampling sites that was flats microhabitat ranged from about 75% to 90%. Vegetation consisted of widely spaced (0.5-5.0 m between plants) dwarf red mangrove (Rhizophora mangle) trees (0.5-2.0 m tall) with varying amounts of vegetation between trees. The substrate at all sites was flocculent, unconsolidated, carbonate marl (Browder et al. 1994).

Dynamic habitat

General areas for site locations were selected based on the potential to show spatial and temporal differences in water level, salinity and temperature. Specific sampling sites were selected based on proximity (within 1 km) to ENP hydrological monitoring stations so that data collected at these stations could be used to interpret the results of fish collections. The eastern most sampling site was located on Biscayne Bay near the northern end of Card Sound Bridge on Barnes Sound (BS: 25° 17.65N by 80° 24.57'W). This site was impounded by roadbeds and received no freshwater sheet flow from the Everglades, therefore, all freshwater input to BS was from local rainfall or groundwater seepage. The BS site experienced diurnal tides approximately 7 to 12 cm in amplitude.

The other three sites were non-tidal and were located just north of Florida Bay in the Taylor Slough/C-111 drainage area of ENP (Figure D.1). These sites were located north of Little Madeira Bay on Taylor River (TR: 25° 13.20'N by 80° 39.00'W), north of the eastern end of Joe Bay (JB: 25° 15.00'N by 80° 31.92'W), and on a tributary west of Highway Creek near US Highway 1 (HC: 25° 15.25'N by 80° 27.28'W). Historically, the amount of fresh water these three sites received from the Everglades presumably decreased from west (TR) to east (HC) based on site proximity to Taylor Slough. However, sheet flow currently reaches northeastern Florida Bay via both Taylor Slough and the C-111 canal. Water from the C-111 exits the canal through 55 gaps in the southern levee along the lower (east to west) reach of the canal, resulting in sheet flow into northeastern Florida Bay (Ley et al. 1995). Between 1983 and 1990, approximately 75% to 90% of water arriving at Florida Bay was delivered via the C-111 canal (Ley et al. 1995; Chiappone 1996). Because the eastern most gaps were at a lower elevation than the central or western gaps, most of this water exited the canal near US-1. This resulted in the majority of fresh water being delivered to the Highway Creek region (the HC site) of Florida Bay with decreasing amounts of fresh water being delivered to the bay at more western locations (Ley et al. 1995). Starting in about 1990, a series of operational changes were made concerning the C-111 canal so that a more equitable distribution of water was delivered across the northeastern coast of Florida Bay (Ley et al. 1995). These changes resulted in a variety of hydrological regimes at the three Florida Bay mangrove sampling sites since 1990 (Ley et al. 1995). Based on these conditions, the four sites were assumed to experience high spatial and temporal variation in the dynamic habitat while the stationary habitat remained relatively constant.

MATERIALS AND METHODS

Hydrologic monitoring

In addition to the ENP hydrostations, water levels were continuously monitored at each site using a Telog brand 2108 potentiometric recorder with a float and pulley design. Accuracy of the equipment was checked by comparing the current measurement of the recorder against a nearby staff gauge each time the system was downloaded. Gaps in the water record were supplemented with data from nearby ENP water level recorders. Salinity was measured at the site on the day of fish collections with an optical refractometer. These data were strongly

correlated to the data recorded by the ENP hydrostations, however, there were minor differences between the two at the JB, HC and BS sites (the hydrostation at TR was located immediately adjacent to the site). Therefore, the continuous records from the ENP hydrostations were refined to better reflect conditions at the sites through the application of regression models generated from salinity data collected on the same dates at both the site and the hydrostation. All regression equations were significant ($p<0.001$) and the adjusted R^2 for the equations were 0.96, 0.92 and 0.98 for JB, HC and BS, respectively. A review of residuals indicated that none of the assumptions for regression analysis were violated (Neter et al. 1996).

To investigate changes in fish abundance along a time gradient, means for hydrologic variables were calculated for a series of time steps prior to each sample. Means and standard deviations for salinity, water level, and temperature were calculated for the day on which each sample was collected and for the 30, 60, 90, 120, 180, 240, 300 and 360 d prior to each sample. A dryness index (DI) was also calculated for the same time intervals. The DI was the number of days out of the period that water level was below the point where the flats began to dry. For example, a 30 d DI of 5 indicates that the flats were exposed 5 of the 30 days prior to the sample.

The time series array of variables resulted in a very large number (59) of potential independent physical variables that could be used to derive linear models of fish abundance (Table D.1). Furthermore, the variables were highly collinear since subsets of the data used to generate the long term variables were also used to generate the short term variables. These problems precluded the direct use of the time series array of variables in any meaningful linear model of fish abundance. Therefore, Principal Components Analysis (PCA) was used as a data reduction tool so that a smaller, orthogonal set of physical composite variables (PC's) could be derived for use in the analysis of fish abundance (Ludwig and Reynolds 1988, Statsoft 1995). The PCA solution was VARIMAX rotated to facilitate interpretation of the principal components. All principle components with an eigenvalue greater than 1 were retained (Kaiser 1960) and the factor scores used in the analysis of fish abundance.

To investigate the impact of the periodicity of physical conditions, thresholds were established for each physical variable and the number of days that the threshold was exceeded was calculated for the period just prior to sample collection (hereafter called threshold period variables). Thresholds were set at greater than 5 cm relative water depth, less than 5 parts per thousand (ppt) salinity, and less than 18° C for temperature. A relative water depth of 5 cm was

chosen because this was the point at which the flats began to become exposed (flats were fully dry at a relative depth of 0 cm). The salinity threshold was chosen based on the observation that some species of submerged aquatic vegetation (important to fishes as habitat and food source) was negatively impacted by salinity above 5 ppt (Unpublished Data. The temperature threshold was chosen based on the work of Frederick and Loftus (1992) which indicated that Everglades fish behavior was unaltered by temperatures at or above this temperature but was altered in lower temperatures. As an example, a salinity threshold period of 250 indicates that salinity was less than 5 ppt for the 250 d prior to collection of the sample. Inclusion of these variable in the PCA would have resulted in their elimination from further analyses because the large number of closely related variables in the PCA would have caused the threshold period variables to have eigenvalues of less than 1. As a result, these variables were used in addition to the composite variables from the PCA in the analyses of fish abundance.

Fish collections

A $9m^2$ drop net method was developed for this study and has been demonstrated to be an effective and unbiased sampling method in this habitat (Appendix A). Nets were set up, left over night and deployed the following day within 2 hrs after sunrise. Each net surrounded an individual dwarf mangrove tree, thereby sampling both prop root habitat and the open area between trees. Trees were selected for sampling such that each site had a similar array of tree sizes with roughly equivalent prop root density sampled between sites i.e., there was consistent sampling of the stationary habitat (as per Browder and Moore 1981) from site to site. Fish were cleared from the net using the fish toxicant rotenone. Any fish missed in the initial collection were found floating on the surface the next day and added to the sample (Appendix A). Net clearing efficiencies ranged from 78% to 90% for the most common fish species and averaged 86% for all marked and recaptured fish (Appendix A). All fish collected were identified, weighed and measured. Weights for specimens collected during the second day collection were calculated from length-weight regressions generated from first day collection fishes.

Fish were collected from HC and JB starting in September 1990. TR was first sampled in December 1991 and BS in April 1992. Data are presented through April 1996. The majority of fish collections were made during the dry season and transitional periods so that the impact of fluctuations in hydrology could be assessed. Sample collections were made in June, September,

and monthly from November through April. Samples were not collected in December 1993, February, June and September 1994, and June and December 1995 for financial reasons. Three nets were collected in each microhabitat (creek and flats) at each site, for a total of six nets per sample.

While the $9m^2$ drop net was designed to catch the small demersal fish (Appendix A), incidental collections of larger fishes did occur. A single large bodied fish could weigh more than the entire sample of smaller fish thereby biasing estimates of biomass. Length frequency distributions indicated that the collection of fish larger than 6.5 cm was rare in the creek microhabitat and did not occur on the flats. The flats microhabitat made up 75 to 90 percent of the habitat utilized by the demersal fish (<6.5 cm) community, indicating that fish larger than 6.5 were not functioning as an integral part of the demersal fish community. In order to accurately analyze the community of small demersal fishes, all fish larger than 6.5 cm (3.2% of total fish collected) were eliminated from the data set.

Preliminary data indicated that the abundance of demersal fishes differed between creek and flats even though the physicochemical parameters were uniform across the two microhabitats. For example, during periods of declining water level, high mortality may occur as fish on the flats are stranded. Those that survive are forced into the creeks. In this situation, sampling only the creek microhabitat would result in the conclusion that sharp declines in water level resulted in increased fish abundance (due to the concentration of fishes into the remaining wetted habitat). However, when the entire landscape subjected to the water decline is considered, the observed effect would be that decreasing water level resulted in fewer fish overall (due to stranding mortality). The concentration effect obfuscates the impact of declining water levels on the demersal fish community across the entire landscape. In order to make statements about the impact of water level (or other physiochemical parameters) on the community as a whole, the estimated abundance of fishes in both microhabitats would have to be combined into a single meaningful estimate of abundance that is uniform across the entire landscape. Therefore, a stratified mean biomass and number of fish per m^2 (density) was calculated for each sample by averaging the weighted means for each habitat type (Cochran 1963). These data were log transformed for use in regression and analysis of variance (ANOVA) models.

Calculation of a stratified estimate requires that the weight of each strata (in this case the wetted area of the creeks and the flats respectively) be known. Since wetted area changed in response to water level variations, remote sensing techniques were employed to estimate wetted area of each strata at any given water depth. High altitude false color images (1:1800 scale) depicting 1 km^2 of wetland centered on each sampling site were acquired from ENP. Using the selection criteria of the Idrisi GIS package (Eastman 1995), each image was separated into several discrete color bands representing small incremental changes (on the order of about 5 cm) in wetland surface elevation. Each site was then surveyed physically to determine the depth range of each color relative to the continuous water level recorder. The ground truthed GIS images could then be used to estimate wetted area for each sample and a stratified mean biomass and density calculated based on the strata weights.

Statistical analysis

Spatial differences in density and biomass were examined by a one-way analysis of variance (ANOVA) between sites. Significant ANOVA were followed by Student-Newman-Keuls multiple range tests to determine the relationship between sites.

To determine which aspects of hydrology best explained the variance among samples, stepwise regressions were performed for each dependent variable (biomass and density) using the composite variable factor scores from the PCA and the threshold period variables as independent variables. The use of stepwise regression as a screening technique for large sets of independent variables has been brought into question because the sequence in which the variables are entered into the stepwise process can impact the results (James and McCulloch 1990). Because forward and backward stepwise techniques enter the variables in a different order (Neter et al. 1996), both techniques were employed to determine if the order in which the variables entered had an impact on the model outcome.

Annual community composition at each site was analyzed by applying Detrended Correspondence Analysis (DCA) (ter Braak 1995) to twelve of the most common species. DCA is an ordination technique that can be used to evaluate differences in community structure between samples (Ludwig and Reynolds 1988; ter Braak 1995). Interpretation of the DCA is such that samples proximal to one another on a plot of the ordination scores have similar species structure (ter Braak 1995). Species were selected for inclusion in DCA if they made up more

than 5% of the catch in any given sample (Table D.2). It proved difficult to evaluate the results of a DCA of 120 samples from 4 sites and 5 years, so the data set was simplified by calculating total biomass for each of the 12 species for each year at each site. A hydrologic year was defined as June 1 to May 31 to coincide with one wet/dry season hydrologic cycle (Kushlan 1980). To determine if any environmental parameters were correlated with the DCA axes, various estimators of annual water level, salinity and temperature (annual mean, standard deviation, minimum, maximum, total number of days per year less than threshold, longest continuous period per year less than threshold) were compared with their associated ordination scores using indirect gradient analysis (Ludwig and Reynolds 1988; ter Braak 1995).

RESULTS

Dynamic habitat

There was a high degree of spatial, inter-annual and intra-annual variation of physical conditions in the mangrove zone (Figure D.2). However, the means of daily water level and salinity at each site indicate a typical annual cycle in the physical environment (Figure D.2). The cycle began in June when water level started to rise following the dry season (Figure D.2A; Kushlan 1980). High temperatures (Figure D.2C) play a role in increasing sea level (Holmquist et al. 1989) and rainfall (Duever et al. 1994) during the summer months thus explaining this increase in water level. Water levels typically climbed throughout the summer (with the exception of a slight dip in August) and peaked in late September or early October. As temperature cooled (Figure D.2C), water level declined through October and November culminating in dry season conditions from February through April and early May (Figure D.2A). Salinity (Figure D.2B) followed an inverted pattern to water level. Salt concentrations were typically highest in late May and declined over the summer months. Fresh water or near fresh water conditions occurred in September and October, followed by a steady rise in salinity beginning in November and continuing through February. In March there was a sharp rise in salinity with the highest salinity generally occurring in April or May.

The PCA identified ten composite variables (hereafter called PC_I, PC_{II} etc.) that had eigenvalues greater than 1 and accounted for 87.8% of the variability in the physicochemical data. The factor loadings (Table D.1) indicate that the variation explained by each composite variable (PC) was discretely correlated with the means or standard deviations of one of the three

main physical variables (water level, salinity and temperature). Furthermore, the factor loadings indicated that the composite variables accounted for variability in the physical data along temporal lines by distinguishing relatively short term from long term trends (Table D.1).

Physicochemical differences between the sites were examined using the factor scores for the composite variables. The median factor score and the 10th, 25th, 75th, and 90th percentiles are presented for the water level (Figure D.3) salinity (Figure D.4) and temperature (Figure D.5) composite variables for each site. To relate the PC factor score variability with actual physicochemical variation, the same parameters (median and CI's) are presented for the physicochemical variable with the highest factor loading for each PC (Table D.1). Box plots for threshold period variables are presented in Figure D.6.

Composite variables for water level (Figure D.3) and continuous hydroperiod (Figure D.6A) allow for the general characterization of TR and BS as high water sites, HC as a low water site, and JB as intermediate relative to one another. Short term water level variability was very similar across the sites except at TR which was less variable than the other sites (Figure D.3C). All four sites had similar ranges of long term standard deviations in water level (Figure D.3D).

Composite variables for salinity (Figure D.4) and continuous low salinity period (Figure D.6B) allow for the general characterization of BS as a high salinity site, TR as a low salinity site, and JB and HC as intermediate. The factor scores for PC_{VIII} (short term salinity variability) indicated that salinity at TR did not change much over relatively short periods of time when compared to the other sites (Figure D.4B), however, over the long term the range in salinity variation was relatively wide at TR (Figure D.4C). The salinity period of record (Figure D.2B) indicated that TR had long periods of fresh water conditions (explaining the low short term variability) punctuated by sharply rising than falling salinity in the late spring thereby increasing the standard deviation around the mean (explaining the wide range in variation over the long term). When considering the other three sites, salinity variability was similar between BS and HC and these two sites had lower variability than JB (Figure D.4B and 4.4C).

The four sites exhibited great similarity in temperature related composite variables (Figure D.5) and in low temperature period (Figure D.6C). However, temporal variation in temperature was pronounced (Figure D.2C) and, therefore, could explain some of the variability observed in the system as whole.

Fish Density

Table D.2 lists the species collected and their relative abundance by percent catch for each site. The most abundant species were the members of the families Cyprinodontidae, Poeciliidae and Cichlidae. The results of the one way ANOVA indicated that there was an effect of site on density ($F=20.03$; $p<0.001$; $df=3$; $dfe=127$) and the Student-Newman-Keuls test results showed that the sites were all different from one another (p_0.05). TR had the highest density followed by BS, JB and HC respectively. An examination of the stratified mean density estimates used in the analyses clearly indicates the differences between sites (Figure D.7).

Stepwise regression analysis of the three threshold period variables and the factor scores from the ten PC's indicated that PC_{VII} (short term mean water level), PC_{I} (long term mean water level), PC_{VI} (short term variation in water level), and PC_{III} (long term variation in temperature) significantly contributed to explaining the 50% of the variance in fish density (Table D.3, Figure D.8). Fish density was positively related to PC_{VII}, PC_{I}, and PC_{III} and negatively related to PC_{VI} (Table D.3). Identical regression equations resulted from forward and backward procedures, indicating that the outcome of the stepwise procedure was not biased by the order in which the variables were entered. Residuals were evaluated according to Neter et al. (1996) and indicated that none of the assumptions for regression analysis were violated.

Fish Biomass

The results of the ANOVA indicated that there was an effect of site on density ($F=34.18$; $p<0.001$; $df=3$; $dfe=127$) and the Student-Newman-Keuls test results showed that the sites were all different from one another (p_0.005). TR had the highest biomass followed by JB, HC and BS respectively. An examination of the stratified mean biomass estimates used in the analyses clearly indicates the differences between sites (Figure D.9).

Stepwise regression analysis of the three threshold period variables and the factor scores from the ten PC's indicated that 'low salinity period' (number of days prior to sample that salinity was less than 5 ppt), PC_{IV} (long term variation in salinity), PC_{VI} (short term variation in water level), PC_{II} (mean salinity), and PC_{I} (long term mean water level), significantly contributed to explaining 61% of the variance in fish biomass (Table D.3, Figure D.10). Fish biomass was positively related to 'low salinity period,' PC_{IV}, and PC_{I} , and negatively related to PC_{VI} and PC_{II} (Table D.3). Identical regression equations resulted from forward and backward procedures,

indicating that the outcome of the stepwise procedure was not biased by the order in which the variables were entered. Residuals were evaluated according to Neter et al. (1996) and indicated that none of the assumptions for regression analysis were violated.

Community Analysis

Species used in the DCA are listed in Table D.2. Axis 1, Axis 2 and Axis 3 of the DCA ordination explained 45.2%, 14.0% and 3.5% of the variance in the mangrove fish community respectively. Axis 3 will not be discussed further since it only explained a small amount of the variance. The ordination along the first two axes split the yearly estimators of community into groupings well defined by site (Figure D.11). Coefficients of correlation between the DCA axes and hydrologic parameters indicate that Axis 1 separated annual communities by the number of low salinity days and the length of the longest low salinity period (Table D.4). Axis 2 was correlated with a variety of parameters, half of which were also estimators of salinity (Table D.4).

DISCUSSION

Dynamic Habitat

The results of the PCA indicate clear distinctions between the dynamic habitat at each site. Differences in water level allow the sites to be characterized as high water, long hydroperiod (TR and BS); low water, short hydroperiod (HC); and variable in hydroperiod (JB). The salinity regime allows for further classification of sites by long periods of high salinity (BS), long periods of low salinity (TR) and variable in salinity and salinity periodicity (JB and HC). Also the sites can be classified by salinity range; TR had the widest range followed by JB, HC and BS respectively. The ANOVA site effect for both density and biomass indicate that these differences in the dynamic habitat may have had a measurable impact on the abundance of fishes within the ubiquitous dwarf mangrove stationary habitat. Regression analyses were used to indicate specific aspects of the dynamic habitat that impact fish abundance.

Fish Density

Regression results indicate that density of fish was positively related to higher water levels over both short term (PC_{VII}) and long term (PC_I) periods. The short term response of

density to water level can be explained by the annual cycle in water level which causes the flats to dry for parts of the year. During low water periods, many fish may become stranded on the wetland surface (pers. obs.), resulting in a decrease in the number of fish. This may also explain the negative relationship between density and short term fluctuations in water level (PC_{VI}). Higher frequency of fluctuations would result in multiple strandings as fish try to exploit the flats between dry periods. Individuals that escape the drying wetland are concentrated into any remaining deeper water habitats, resulting in the number of fish per square meter being initially very high (Higer and Kolipinski 1967; Kushlan 1976a; Kushlan 1980; Loftus and Eklund 1994; Pers. Obs.). This concentration effect attracts predators and depletes oxygen resulting in additional mass mortality of fishes (Hunt 1952; Odum and Heald 1975; Kushlan 1976b; Tramer 1977; Loftus and Kushlan 1987; Master 1992; Bancroft 1994; Pers. Obs.). Based on these observations, low water events would quickly result in an overall decline in the number of resident fish (Kushlan 1976b; Masters 1992; Loftus and Eklund 1994; Pers. Obs.).

The longer term response of density to water level may indicate the time needed for fish to recover from drying events. As early colonizers of newly inundated wetlands, these species have a very quick reproductive response to increasing water levels and, thereby, can successfully take advantage of ephemeral wetlands (Harrington 1959; Foster 1967; Wourms 1972; Haake and Dean 1983; Loftus and Kushlan 1987). However, it may take several reproductive events for the population to recover after experiencing significant loses to drying events (Heald et al 1974; Kushlan 1980; Loftus and Kushlan 1987; Loftus and Eklund 1994). As a result, the increases in the number of fish may be a long term response of the fish populations.

The finding that increased water level is positively related to fish density is supported by the ANOVA post hoc tests. TR or BS had the longest hydroperiod, longest continuous flooded period, and the highest mean water level every year and also had the greatest density of fishes. HC was a relatively shallow site with a short hydroperiod and experienced lower fish density. JB was intermediate in regards to estimates of water level and density.

Long term variation in temperature (PC_{III}) was also positively correlated with density. Taylor (1990) stated that temperature was one of the primary controllers of reproduction in estuarine fishes, particularly athrinids and cyprinodontids. Changes in temperature would, therefore, be expected to impact the reproductive output and influence fish density through recruitment potential. The optimal temperature range for oocyte growth and egg hatching is both

much narrower and well defined than other physiological processes in many fishes (Gerking 1980; Munro 1990). Increased long term variation in temperatures might indicate that a diverse set of fish species had been within their optimum reproductive range during a discrete time period (e.g. 240 d) such that recruitment was enhanced and overall density increased over that time period.

Fish Biomass

Fish biomass can increase through: 1) an increase in the number of fish within the existing populations; 2) an increase in the mean size of fishes (i.e., condition factor) within the existing population; and 3) a change in community species structure with the new populations having biomass in excess of any populations that were displaced over the same time period (Kushlan 1976a). The duplication of two water level related regression variables (PC_I: long term mean water level and PC_{VI}: short term water level variation) in both the density and biomass models indicates that at least some of the changes in biomass were the result of changes in recruitment due to hydroperiod length. However, the other biomass regression components ('low salinity period,' PC_{II}: mean salinity, and PC_{IV}: long term variation in salinity) were different than those for the density regression, indicating that changes in biomass were not simply due to changes in density but were independently impacted by the salinity regime.

Fish biomass responded negatively to periods of high salinity as indicated by inclusion of PC_{II} (mean salinity) in the regression model. The model also indicated that biomass was positively correlated with long freshwater periods ('low salinity period'), further indicating that fishes were negatively impacted by chronically high salinity. The ANOVA post hoc tests supported these findings. BS experienced near marine salinities year round and had the lowest biomass of the sites. TR generally exhibited a prolonged annual freshwater period compared to the other sites and had the highest biomass. JB and HC had similar salinity regimes, however, JB experienced longer periods of low salinity than HC, possibly explaining the lower biomass at HC than at JB.

Presumably the salinity regime impacted biomass by either changing the individual fish size within the existing community or changing the species structure of the community toward smaller or larger bodied species. The indirect gradient analysis of DCA scores showed that community structure was associated with changes in salinity possibly indicating the latter.

Furthermore, the regression analysis indicated that high mean salinity (PC_{II}) had a negative impact on mangrove resident fishes even though most of the species commonly collected were euryhaline (Simpson and Gunter 1956; Foster 1967; Loftus and Kushlan 1987; Nordlie et al. 1992). Since the biomass of euryhaline species should remain relatively unaffected by changes in mean salinity, the implication is that observed changes in biomass were most likely the result of adding species sensitive to salinity during low salinity periods.

The concept that increased mean salinity negatively impacted fishes on the individual level can not be fully dismissed from these findings, however. Although the euryhaline fish themselves may be physiologically unaffected by changes in salinity, the availability of preferred food items may be lower during high salinity periods, thereby resulting in less or lower quality food for these fish. Consequently, the habitat available to fishes may be inferior at even moderate salinity levels. In a study of submerged aquatic macrophytes of northeastern Florida Bay, Montague and Ley (1993) demonstrated the importance of the salinity regime on primary production. In an associated manuscript, Ley et al. (1994), indicated that locations with impoverished primary production due to the salinity regime resulted in lower quality diets of mangrove fishes. Preliminary results from standardized counts of aquatic macrophytes at the sampling sites indicated that submerged vegetation was negatively impacted by ambient salinities above ~5 ppt, potentially explaining the biomass/salinity relationship. A more detailed analysis of both plant and fish communities, an examination of fish condition factor at the population level and controlled field and laboratory growth/salinity experiments on the most common species would help resolve this question.

An enigmatic result of the regression analysis was that biomass was positively correlated with variables that represented both stable salinity ('low salinity period') and variable salinity (PC_{IV}: long term variation in salinity) over relatively long periods. One possible explanation is that there was a bi-model response at the community level. Prolonged low salinity would favor oligohaline species while high variation favors true euryhaline fishes. Extremes in either parameter might result in increased biomass overall. The findings of the DCA (that salinity was a major factor in determining the species composition) could be interpreted as supporting this possibility, however, a more detailed analysis of community structure and population responses to salinity would be needed to successfully evaluate this possibility.

A second possible explanation is that, although pulsed salinity events may be detrimental to some submerged plants (Montague and Ley 1993) and fish (Serafy et al. 1997) in the short term, the long term effect may be positive (Odum et al. 1995). Infrequent pulses of marine water into the mangrove system might deliver to, or cause deposition of, biotically important compounds (e.g.. sulfate, bicarbonate, orthophosphate) thus facilitating greater primary and secondary production (Kemp 1989). If followed by relatively long periods of low salinity, oligohaline plant species may exploit the relative abundance of these compounds (as compared to fresh water systems) resulting in increased production. Over time these compounds may again become limiting if not replenished by a pulse of marine water resulting in a decline in production (Odum et al. 1995). In this study, samples were collected with both long periods of low salinity and high long term salinity variation. This could happen only if salinity immediately preceding the sample was below 5 ppt for a prolonged period (> 200 d) and if prior to the low salinity period, salinity was relatively high (20 ppt). Perhaps the pulses of marine water into the mangroves provided the raw materials for high primary productivity and resultant secondary productivity. The relative low stress of the stable salinity period following the pulses allowed the deposited compounds to be fully exploited (Montague and Ley 1993) resulting in the observed high fish biomass under these circumstances.

Montague and Ley (1993) periodically sampled Florida Bay macrophytes and benthic crustaceans in conjunction with a variety of physicochemical parameters and found that variation in salinity had a negative impact on the flora and fauna examined. Ley (1992) also found that the standard deviation of mean salinity was negatively correlated with fish biomass. Finally, Ley et al. (1994) concluded that the diets of fishes in areas of high salinity variation were inferior to those of more stable salinity environments. The authors speculated that higher variance in ambient salinity caused reduced productivity in benthic plants and crustaceans resulting in lower quality prey and lower biomass in fishes (Ley et al. 1994). Stable salinity had the opposite effect. These findings support the inclusion of 'low salinity period' as a positive correlate with biomass but are contradictory to the inclusion of PC_{IV} (long term salinity variation).

It is possible that the seemingly contradictory components of the biomass regression model ('low salinity period' and PC_{IV}: long term salinity variation) are an artifact of the annual cycling of physicochemical parameters within the dwarf mangrove sites. During a given year, peak salinity was about the same at all sites so the major differences between sites was the period

of low salinity. Sites with a longer low salinity period had lower mean salinity than sites with shorter periods (Figure D.4A and Figure D.6B). Since peak salinity was about the same at all sites, the standard deviation of the mean would be higher at the site with the lower mean salinity. The result is that prolonged periods of low salinity tend to co-occur with high long term salinity standard deviations. Given the results of Ley (1992), Montague and Ley (1993), and Ley et al. (1994), it is possible that in the current analysis the period of low salinity was a determining factor in fish biomass but the inclusion of high salinity variation in the regression model was an artifact of the parameters included for the analysis. However, the very weak relationship between the variables PC_{IV} and 'low salinity period' ($r = -0.24$) places some doubt about the probability of this being simply an analytical artifact.

This exploratory observational study established correlations but did not establish causal relationships (Neter et al. 1996). Observed differences in fish abundance and community structure between sites could be the result of factors other than salinity, water level and temperature. For example, differential predation rates, interspecies competition, historical artifacts in site conditions or random chance could have resulted in the observed differences between sites. However, the analyses performed strongly suggest a causal relationship between hydroperiod and salinity and the demersal fish community. Controlled experiments and further analyses are needed to verify this conclusion.

CONCLUSIONS AND DISSERTATION SIGNIFICANCE

Fish density was found to be primarily correlated with hydroperiod and water level, presumably through greater recruitment during high water periods and high mortality during low water periods. The influence of water level on density was also reflected by increases in biomass with increased water level. In addition to increased biomass through increased density, biomass was also influenced by changes in the salinity regime. Presumably biomass increased as a result of changes in individual fish body size or through a shift in the community toward heavier-bodied fish species. The regression analysis and the ANOVA indicated that higher mean salinity resulted in lower biomass within the demersal fish community. Periods of high salinity variability and prolonged periods of low salinity over relatively long time-periods (e.g.. 300 d) were both correlated with increased biomass. Three plausible explanations for the inclusion of these seemingly contradictory variables were suggested. 1) The presence of oligohaline

specialists and euryhaline species in the community resulted in a bi-modal pattern in biomass. 2) The combination of low salinity periods punctuated by high salinity events promotes primary and resultant secondary production. 3) The observed contradiction was an artifact of the parameters used in the analysis, and long periods of stable salinity were the more likely determinant of biomass.

Several conclusions can be drawn from this chapter regarding the abundance of prey for higher trophic levels, and it's relationship to demersal fish abundance in the mainland coastal wetlands of northeastern Florida Bay. First, overall prey base abundance is closely associated with wet season hydroperiod. The duration of the period determines the length of time that fish can exploit seasonally inundated portions of the wetland. Fish density is, therefore, a function of hydroperiod length and the individual generation times and growth rates of the various fish species (DeAngelis et al 1997). Second, the biomass of the prey base is impacted by hydrographic conditions; specifically, fish production is related to the salinity regime such that increased freshwater flow is correlated with increased prey base fish stock. These conclusions are supported by prior studies of similar fish communities in the Everglades/Florida Bay hydroscape (Kushlan 1978; Loftus and Kushlan 1987; Montague and Ley 1993; Ley et al. 1994; Loftus and Eklund 1994; DeAngelis et al. 1997).

As described in the previous chapter, anthropogenic diversion of water has resulted in shortened hydroperiods and longer periods of relatively high salinity in the mangrove zone. Based on the above conclusion, water management practices likely resulted in a prey-base fish community that was less robust than the historic one. Fewer fish (due to shortened hydroperiod) and lower biomass (due to higher and more variable salinity) would have far-reaching implications for higher trophic levels.

Many predators take advantage of this prey base fish community during periods of high concentration. Unlike Roseate Spoonbill, many of these predators can switch to other food resources during periods of low fish abundance. Because of their unique tactile feeding behavior, Roseate Spoonbills feed almost exclusively on this concentrated prey base fish community and are highly dependant on high prey availability if they are to successfully reproduce in Florida Bay. If the above conclusions regarding the impact of water management on the prey base are correct (a declining prey base associated with the diversion of water away from the Northeastern Basin), a measurable decline in nesting parameters would be expected for

spoonbills that forage in the mainland coastal wetlands of northeastern Florida Bay. The next chapter examines this hypothesis.

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Table D.1 Results of principle components analysis shown as factor loadings for the first ten principal components after VARIMAX rotation. Highlighted loadings indicate absolute scores >0.7 except for PC_{IX} for which the highest scores were 0.34 to 0.38. Parameters are calculated from continuously recorded data for the period (#d) indicated prior to the date of fish collections.

Parameter	Period	PC_I	PC_{II}	PC_{III}	PC_{IV}	PC_V	PC_{VI}	PC_{VII}	PC_{VIII}	PC_{IX}	PC_X
MEAN	1	-.27	.13	-.01	.02	.1	-.11	**.72**	-.1	.16	.03
WATER	30	-.38	.01	-.09	-.08	.02	0	**.83**	-.07	.15	-.04
LEVEL	60	**-.44**	-.03	-.09	-.12	.01	.06	**.81**	-.14	.09	-.14
	90	-.5	-.08	-.05	-.16	.02	.09	**.77**	-.14	0	-.18
	120	-.62	-.1	-.02	-.16	.01	.11	.65	-.16	-.06	-.22
	180	**-.83**	-.09	-.01	-.11	.04	.09	.39	-.16	-.11	-.18
	240	**-.94**	-.02	.02	-.02	.1	0	.19	-.14	.01	-.06
	300	**-.94**	.07	.05	.1	.13	-.07	.13	-.11	.1	.04
	360	**-.87**	.13	.06	.17	.17	-.09	.21	-.12	.15	.08
WATER	30	-.01	.23	-.03	-.01	.04	**.75**	.04	.15	.13	-.02
LEVEL	60	.03	.17	.02	.05	.11	**.86**	.09	-.02	0	-.12
STD.	90	-.05	.19	.06	.06	.3	**.76**	.05	.01	-.23	-.18
DEV.	120	-.06	.13	.08	.07	.47	.52	.06	.13	-.38	-.27
	180	-.12	.06	-.05	.2	**.76**	.21	-.07	.16	-.37	-.14
	240	-.03	.04	.16	-.02	**.9**	.1	-.1	-.08	.08	.05
	300	-.12	-.1	.24	-.3	**.79**	.15	-.03	-.16	.17	.08
	360	-.22	-.21	.17	-.4	**.74**	.08	-.01	-.13	.08	.13
DRYNESS	30	.41	.13	.02	.02	.16	.05	**-.76**	-.04	.02	0
INDEX	60	.48	.16	.03	.05	.16	.02	**-.76**	-.01	.15	.04
	90	.53	.2	.03	.05	.12	-.01	**-.73**	-.05	.22	.05
	120	.62	.21	.02	.06	.1	-.06	-.65	-.05	.24	.06
	180	**.8**	.17	.05	.03	.07	-.13	-.42	-.01	.23	.04
	240	**.92**	.07	.04	-.08	0	-.08	-.21	.01	.15	-.01
	300	**.92**	-.05	.01	-.23	-.09	.04	-.14	.02	.02	-.05
	360	**.84**	-.13	-.04	-.31	-.17	.09	-.23	.06	-.07	-.08
MEAN	1	-.02	**.87**	-.03	.07	.14	.07	-.26	.05	.12	.01
SALINITY	30	.01	**.92**	.04	.11	.01	.06	-.2	.09	.14	.05
	60	.02	**.94**	.02	.12	-.01	.08	-.17	.06	.14	.06
	90	.02	**.96**	.02	.13	-.01	.08	-.1	.05	.09	.08
	120	.07	**.96**	.03	.11	.01	.03	.02	.08	.02	.1
	180	.1	**.94**	.02	.03	.01	.02	.22	.12	-.06	.08
	240	.07	**.89**	.05	-.14	-.03	.11	.32	.08	-.11	.06
	300	-.01	**.87**	.03	-.25	-.08	.16	.28	.1	-.19	.02
	360	-.06	**.86**	-.03	-.28	-.1	.17	.18	.14	-.2	0
SALINITY	30	-.03	.15	.02	-.11	-.24	.14	-.08	**.78**	.08	.09
STD.	60	.21	.18	.01	-.07	-.12	.15	-.21	**.79**	.02	.13
DEV.	90	.4	.25	.01	-.17	.14	-.05	-.07	**.76**	-.06	.14
	120	.49	.19	.01	-.23	.27	-.18	.15	.55	-.16	.17
	180	.58	.2	-.11	-.38	.28	-.2	.24	.33	-.02	.05
	240	.43	.09	.04	**-.77**	.13	.04	.23	.07	.05	-.03
	300	.19	-.02	-.05	**-.9**	.07	-.03	.01	.12	-.04	-.14
	360	.1	-.07	-.17	**-.86**	.08	-.11	-.14	.17	-.02	-.13
MEAN	1	-.03	.09	-.04	.29	-.01	-.22	-.33	.12	.16	.5
TEMP.	30	.12	.2	-.05	.22	.08	-.32	-.3	.25	.29	.67
	60	.22	.2	-.09	.22	.09	-.26	-.07	.28	***.34***	.71
	90	.27	.19	-.18	.22	.08	-.19	.15	.24	***.38***	.69

	120	.31	.19	-.22	.2	.08	-.12	.4	.21	***.38***	.58
	180	.26	.2	-.27	.11	.03	.07	.75	.09	.21	.26
	240	.09	.26	-.32	.12	-.01	.17	.82	0	-.07	.01
	300	-.03	.33	-.31	.22	-.03	.17	.73	-.11	-.26	-.01
	360	-.1	.41	-.25	.36	-.05	.04	.51	-.11	-.33	.23
TEMP.	30	.04	-.05	.15	-.06	-.08	.12	.13	.01	.08	**-.85**
STD.	60	.04	-.03	.19	-.02	0	-.03	.02	-.05	.05	**-.93**
DEV.	90	.07	.01	.3	.06	.08	-.07	-.04	.03	.09	**-.89**
	120	.06	-.01	**.44**	.17	.11	-.04	-.12	.01	.19	**-.73**
	180	.12	-.07	**.79**	.1	.11	.03	-.1	-.06	.12	-.33
	240	-.04	0	**.88**	.04	.03	0	-.16	-.01	-.08	-.28
	300	-.07	.09	**.87**	.02	.11	.02	-.22	.03	-.11	-.24
	360	-.03	.15	**.83**	0	.2	.04	-.15	.07	.03	-.24
% Total Variance		24.5	17.4	12.7	9.9	6.6	4.8	4.4	3.5	2.1	2.0

Cumulative Variance Explained = 87.8%

Table D.2 Phylogenetic list of all species sampled and the percent of catch at each site. Percent catch for all sites combined, total fish collected per site, number of species collected, number of dates and total nets sampled are also included. All fish collected are represented, however, only fish less than 6.5 cm were used in subsequent analyses. Species used in the community analysis (DCA) are marked with an asterisk (*).

ORDER Family Genus species	Common Name	TR	JB	HC	BS	All Sites
SILURIFORMES						
Ictaluridae	Freshwater catfish					
Ameiurus natalis	Yellow Bullhead		0.02			0.01
Noturus gyrinus	Tadpole Madtom			0.02		<0.01
Clariidae	Labyrinth catfishes					
Clarias batrachus	Walking catfish		0.02			0.01
BATRACHOIDIFORMES						
Batrachoididae	Toadfishes					
Opsanus beta (juv)	Gulf Toadfish		0.01		0.24	0.04
ATHERINIFORMES						
Atherinidae	Silversides					
Menidia sp	Inland Silverside	2.72	4.10	0.98	6.61	3.45
Belonidae	Needlefishes					
Strongylura notata (juv)	Redfin Needlefish	0.01	0.06	0.02	0.32	0.08
Cyprinodontidae	Killifishes					
Adinia xenica	Diamond Killifish		0.09	1.54	0.28	0.42
Cyprinodon variegatus*	Sheepshead Minnow	5.18	17.25	37.90	14.10	18.05
Floridichthys carpio*	Goldspotted Killifish	0.44	1.11	6.30	29.21	6.94
Fundulus chrysotus	Golden Topminnow	0.29	0.35	0.02		0.20
F. confluentus*	Marsh Killifish	0.52	4.61	9.17	0.18	3.76
F. grandis*	Gulf Killifish	0.09	2.79	8.61	1.30	3.10
F. seminolis	Seminole Killifish	0.06				0.02
F. similis	Longnose Killifish	0.07	0.28	0.77	0.22	0.32
Jordanella floridae*	Florida Flagfish	0.02	0.23	0.09		0.10
Lucania goodei*	Bluefinned Killifish	14.13	1.98	0.89		4.71
Lucania Parva*	Rainwater Killifish	32.17	25.86	13.49	16.02	23.10
Poeciliidae	Livebearers					
Belonesox belizanus	Pike Killifish	0.24	0.49	0.11	0.02	0.25
Gambusia holbrooki*	Mosquitofish	1.11	2.00	2.86	0.81	1.74
Poecilia latipinna*	Sailfin Molly	5.83	13.14	9.91	5.88	9.17
CYPRINIFORMES						
Cyprinidae	Minnows					
Notropis sp	Shiner	0.50	0.01			0.14
Catostomidae	Suckers					
Erimyzon sucetta	Lake Chubsucker		0.01			<0.01
GASTEROSTEIFORMES						
Syngnathidae	Pipefishes					
Syngnathus louisianae	Chain Pipefish				0.12	0.02
PERCIFORMES						
Gerreidae	Mojarras	0.04	0.05	0.03	3.47	0.63
Gobiidae	Gobies					
Gobiosoma bosc	Naked Goby	0.29	0.02			0.08
Gobiosoma robustum	Code Goby	0.01				<0.01
Lophogobius cyprinoides*	Crested Goby	8.01	0.02			2.19
Microgobius gulosus*	Clown Goby	8.31	1.13	0.45	21.10	6.38
Centrarchidae	Sunfish spp.	0.37	0.96	0.02		0.42
Elassoma evergladei	Pygmy sunfish	0.12				0.03
Enneacanthus gloriosus	Blue Spotted Sunfish	0.09		0.02		0.03

Lepomis marginatus	Dollar Sunfish	0.05	0.08	0.02		0.04
Lepomis punctatus	Spotted Sunfish	0.24	0.26	0.03		0.16
Lepomis microlophus	Redear Sunfish			0.02		<0.01
Micropterus salmoides	Large mouth Bass	0.05				0.01
Cichlidae	Cichlids					
Cichlasoma bimaculatum	Black Acara		0.02	0.03		0.01
*C. urophthalmus**	Mayan Cichlid	14.73	22.49	6.60		12.93
Tilapia mariae	Spotted Tilapia	4.31	0.55	0.09		1.38
PLEURONECTIFORMES						
Soleidae	Soles					
Trinectes maculatus	Hogchoker		0.01	0.02	0.14	0.03
Totals		8026	9711	6607	5070	29414
Number Of Species		29	31	26	17	39
Number Of Nets Sampled		149	187	172	152	660
Number Of Dates Sampled		29	39	37	27	132

Table D.3 Results of regression analyses. Forward and backward stepwise regressions yielded identical equations for both independent variables. The factor loadings for PC_I and PC_{IV} were negative and they were negative in the regression resulting in a positive relationship between these variables and biomass

Ind. Variable	ANOVA	R^2	Y-Int	Dependent Variable	B	t	p
Log Density	N=121	.50	.594	PC_{VII}: Short Term Mean Water Level	.132	8.82	<.001
	F=26.65			PC_I: Neg Long Term Mean Water Level	-.086	-5.37	<.001
	p<.0001			PC_{VI}: Short Term Water Level Variability	-.051	-3.42	<.001
	df=4, 116			PC_{III}: Long Term Temperature Variability	.039	2.52	.013
Log Biomass	N=121	.61	.477	Low Salinity Period	.063	3.39	<.001
	F=37.72			PCIV: Neg Long Term Salinity Variation	-.079	-5.94	<.001
	p<.0001			PCVI: Short Term Water Level Variation	-.057	-4.52	<.001
	df=5, 115			PCII: Mean Salinity	-.071	-4.13	<.001
				PCI: Neg Long Term Water Level	-.053	-3.96	<.001

Table D.4 Coefficients of correlation (r^2) for hydrologic factors with annual scores on the first two DCA axes. "Period" and "# Days Per Year" refers to the longest continuous period and the total number of days per year (respectively) that temperature was below 18C, water level was above 5 cm on the flats or salinity was less than 5 ppt. ns = not significant at $p<0.01$

	AXIS 1			AXIS 2		
PARAMETER	Salinity	Water Level	Temp.	Salinity	Water Level	Temp.
MEAN	ns	ns	ns	0.69	ns	0.57
STD. DEV.	ns	ns	ns	ns	ns	ns
MINIMUM	ns	ns	ns	0.67	ns	ns
MAXIMUM	ns	ns	ns	ns	0.67	ns
RANGE	ns	ns	ns	ns	ns	ns
# DAYS PER YEAR	-0.67	ns	ns	-0.63	0.58	ns
PERIOD	-0.67	ns	ns	ns	ns	ns

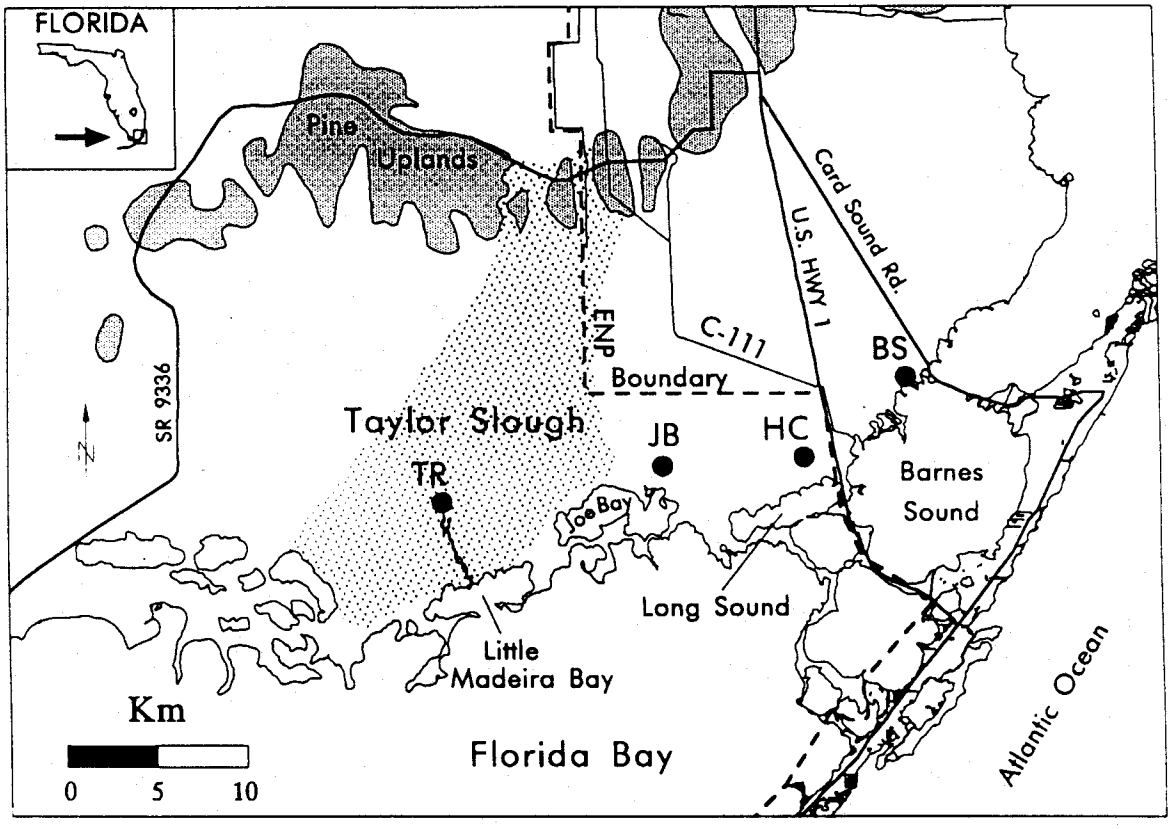


Figure D.1 Map of Southern Florida and Florida Bay showing location of sampling sites, Taylor Slough, Everglades National Park (ENP) boundary and the southern terminus of the South Dade Conveyance System (C-111 canal). Site locations are Taylor River (TR), north of Joe Bay (JB), west of Highway Creek (HC), and north of Barnes Sound (BS).

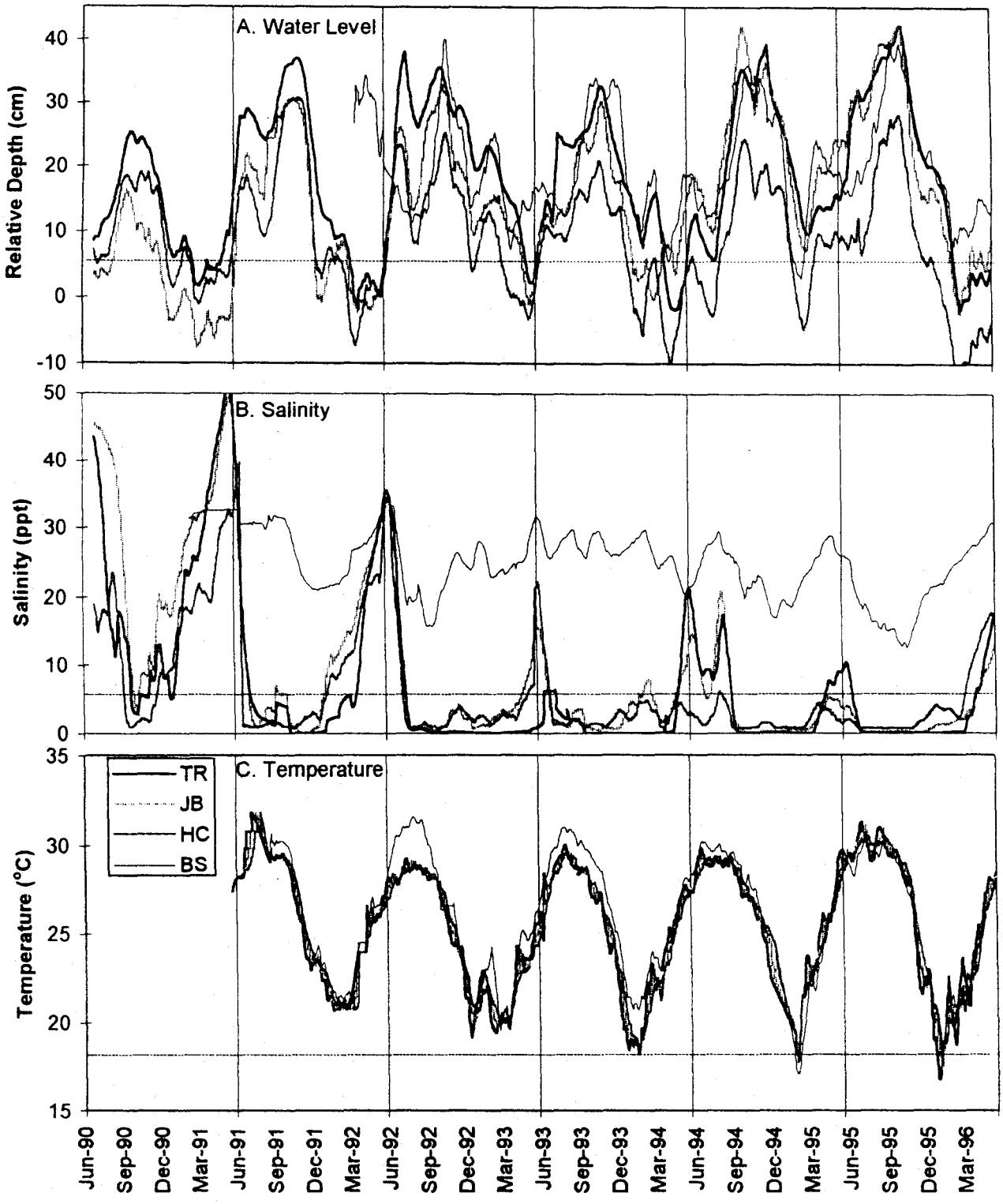


Figure D.2 Period of record for water level (A), Salinity (B), and Temperature (C) from continuous data recorders. Data presented are 30 d running averages. Horizontal lines on each graph indicate the threshold set for each parameter (Water Level = 5 cm, Salinity = 5 ppt, Temperature = 18°C). Temperature data from 1990-1991 are unavailable.

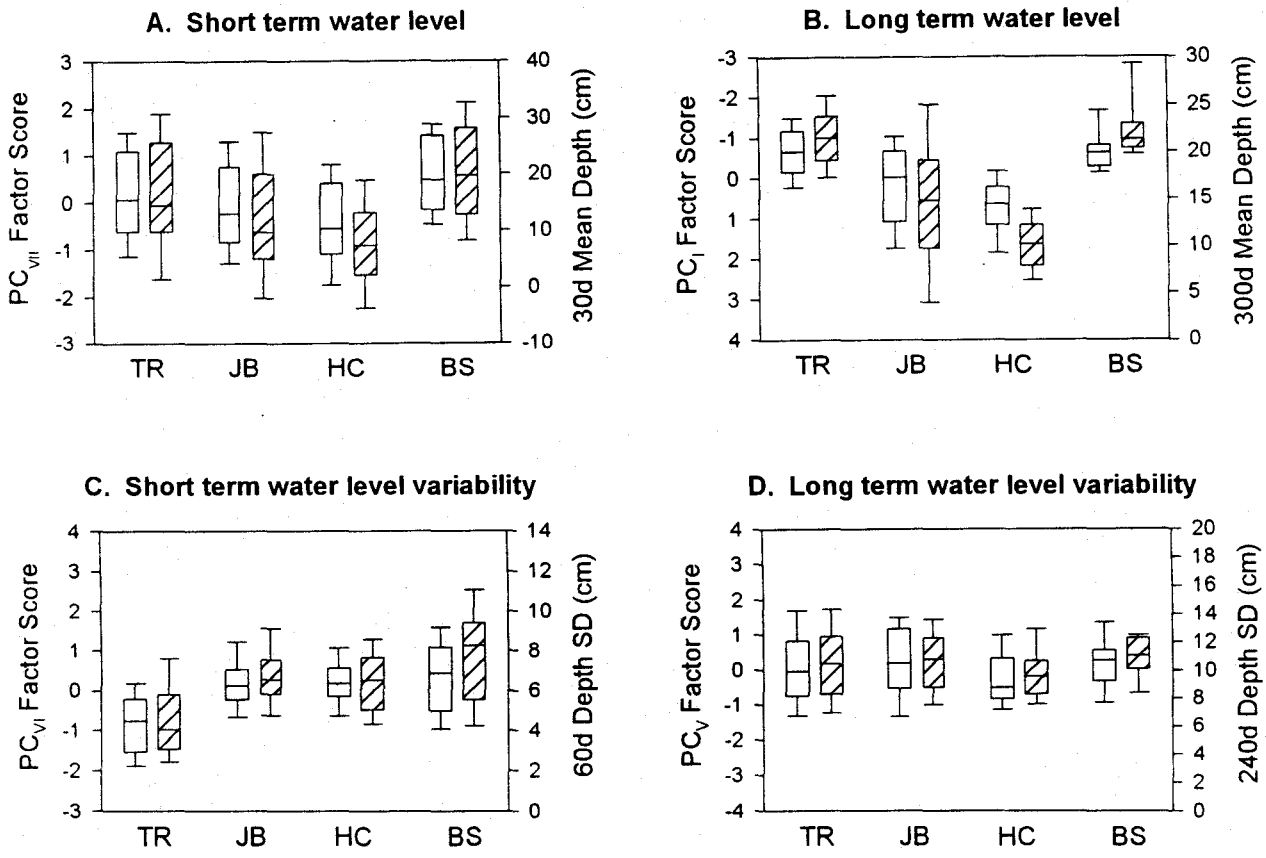


Figure D.3 Box and whisker plots for water level composite variables (PC's). To relate the PC factor score variability with actual physicochemical variation, the physicochemical variable with the highest factor loading for each PC (see Table D.1) is also presented. The left and right Y-axes are arranged so that the medians for the PC's and the physicochemical variables are synchronous. PC's with a negative factor loading with the correlated physicochemical variable are presented with an inverted axis for ease of comparison.

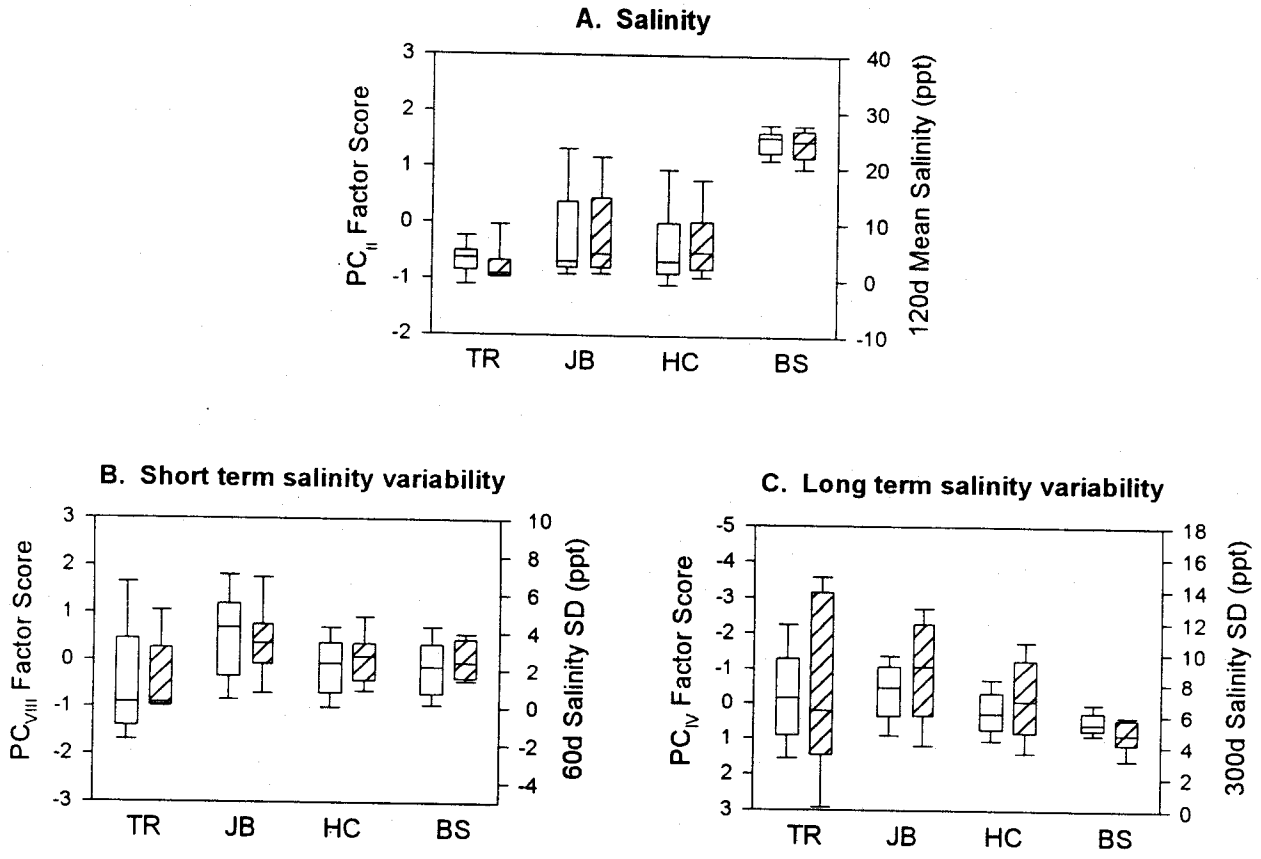


Figure D.4 Box and whisker plots for salinity composite variables (PC's).

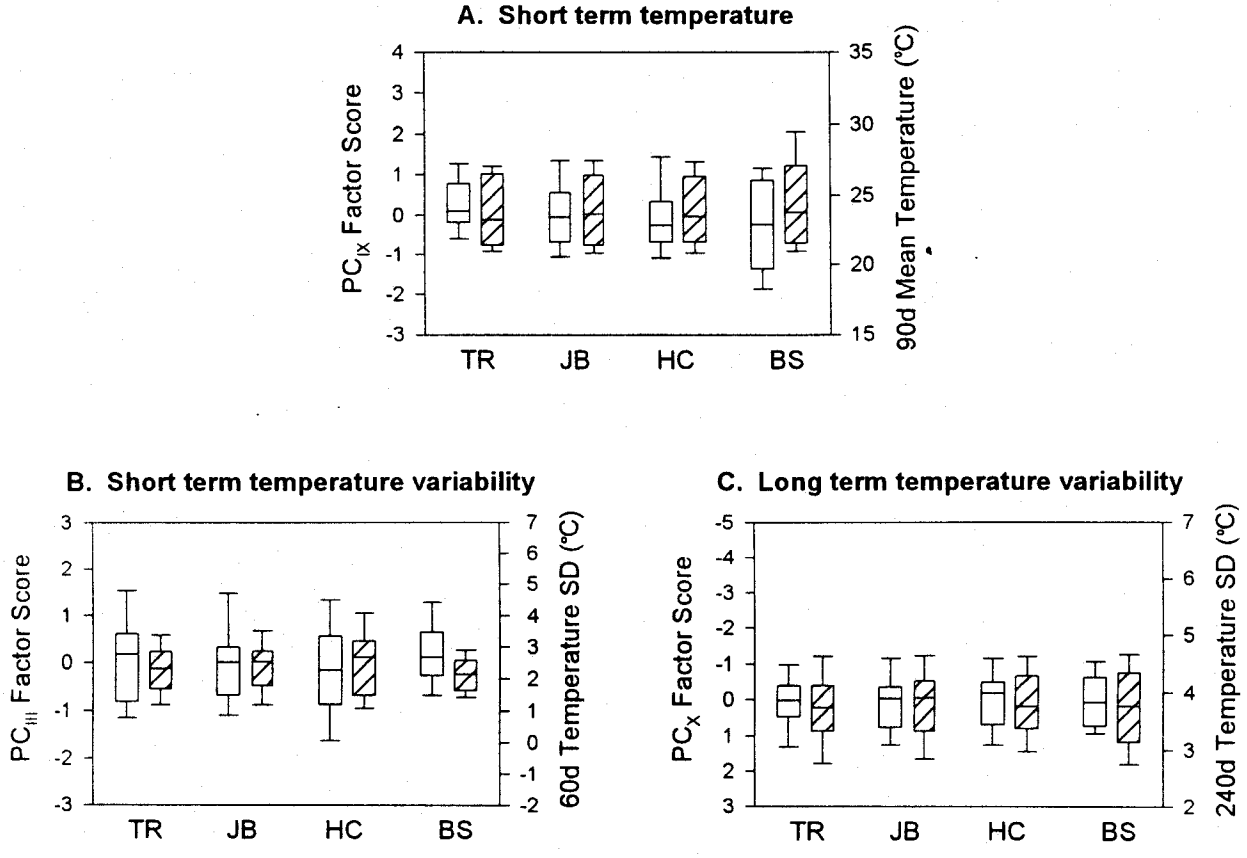


Figure D.5 Box and whisker plots for temperature composite variables (PC's).

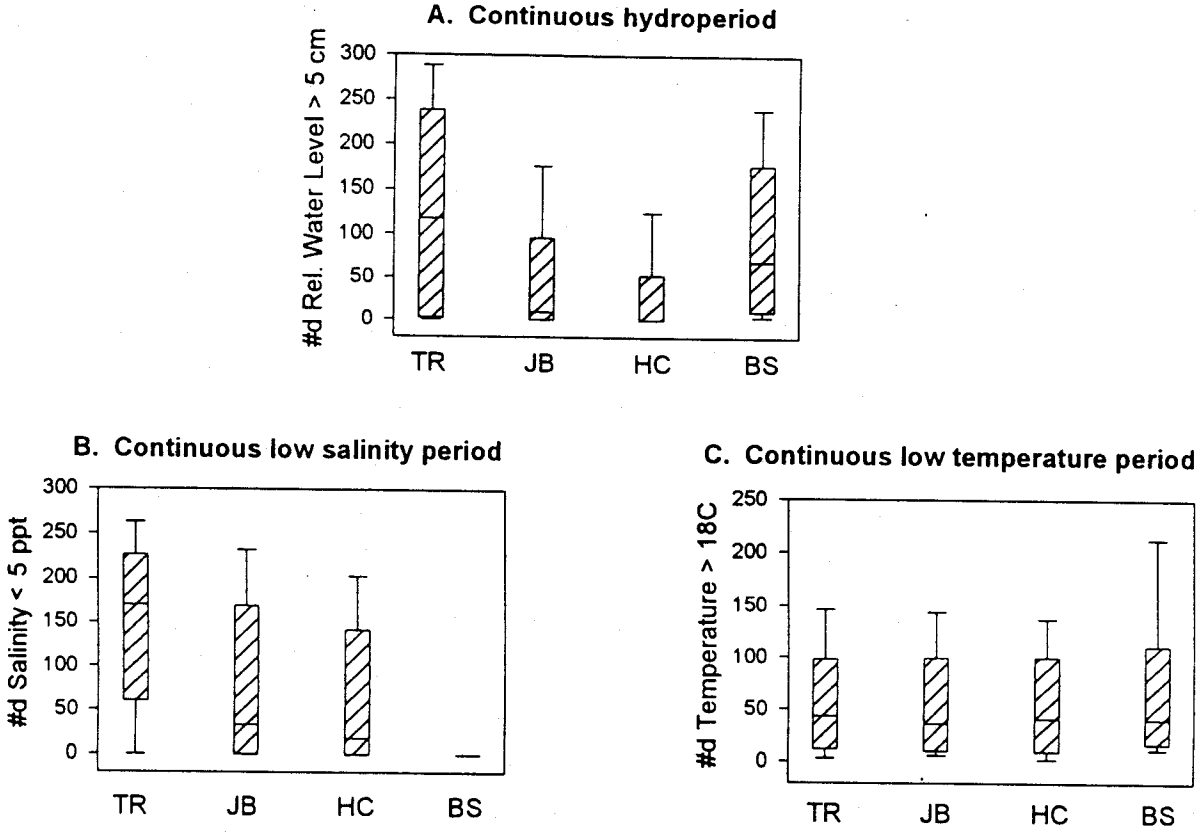


Figure D.6 Box and whisker plots for threshold period variables. The center horizontal line in the box is the median number of days that the threshold was exceeded (water level > 5 cm, salinity < 5 ppt, and temperature < 18°C),. The top and bottom of the box are the 25th and 75th percentiles (quartiles) and the ends of the whiskers are the 10th and 90th percentiles.

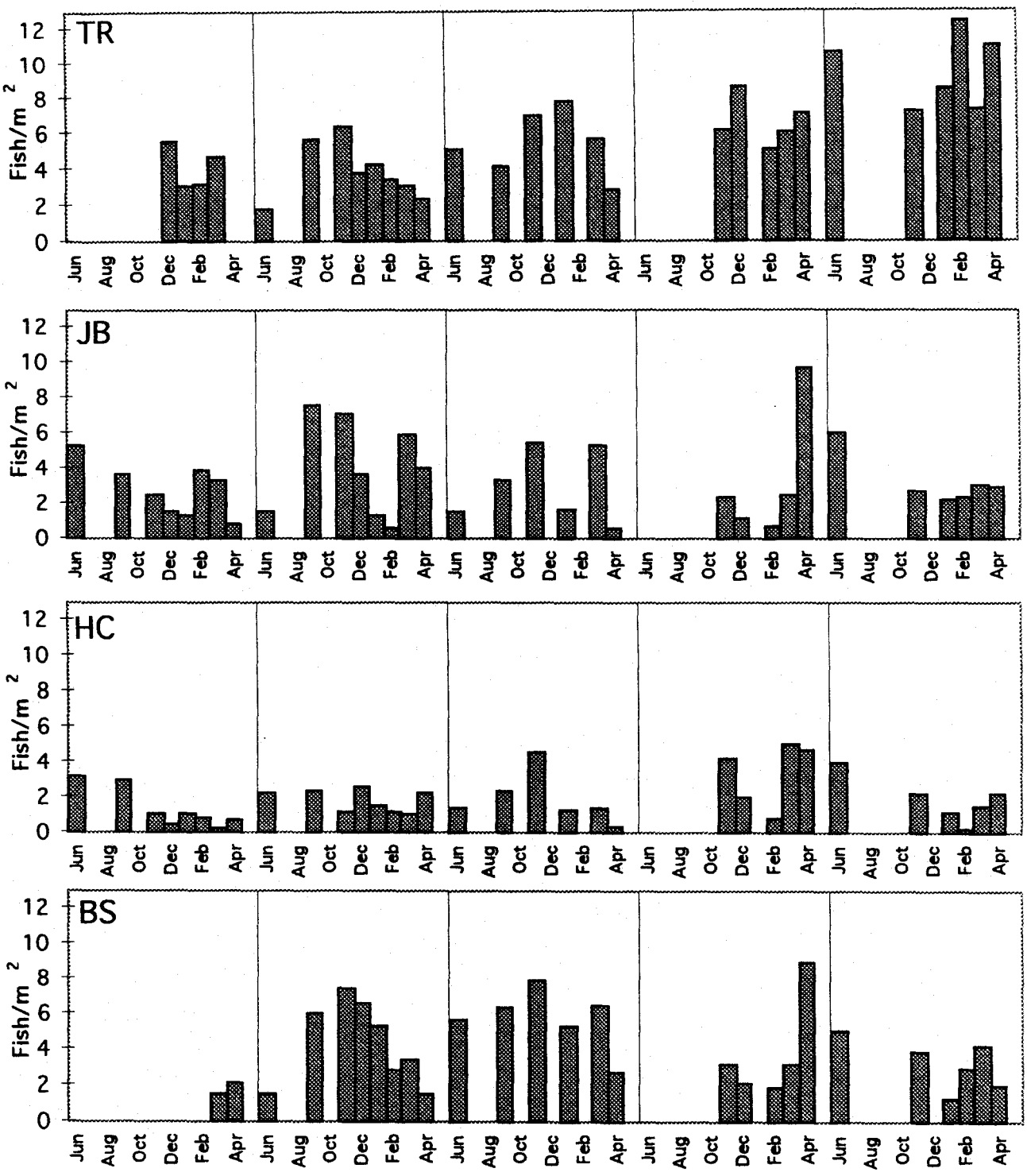


Figure D.7 Stratified mean density of fish for every sample collection. Sites ranked by density are TR>BS>JB>HC and sites are all significantly different from each other. Sampling did not begin at TR and BS until December 1991 and March 1992 respectively. Ideally, samples were scheduled for June, September and monthly from November through April, however not all months were sampled every year.

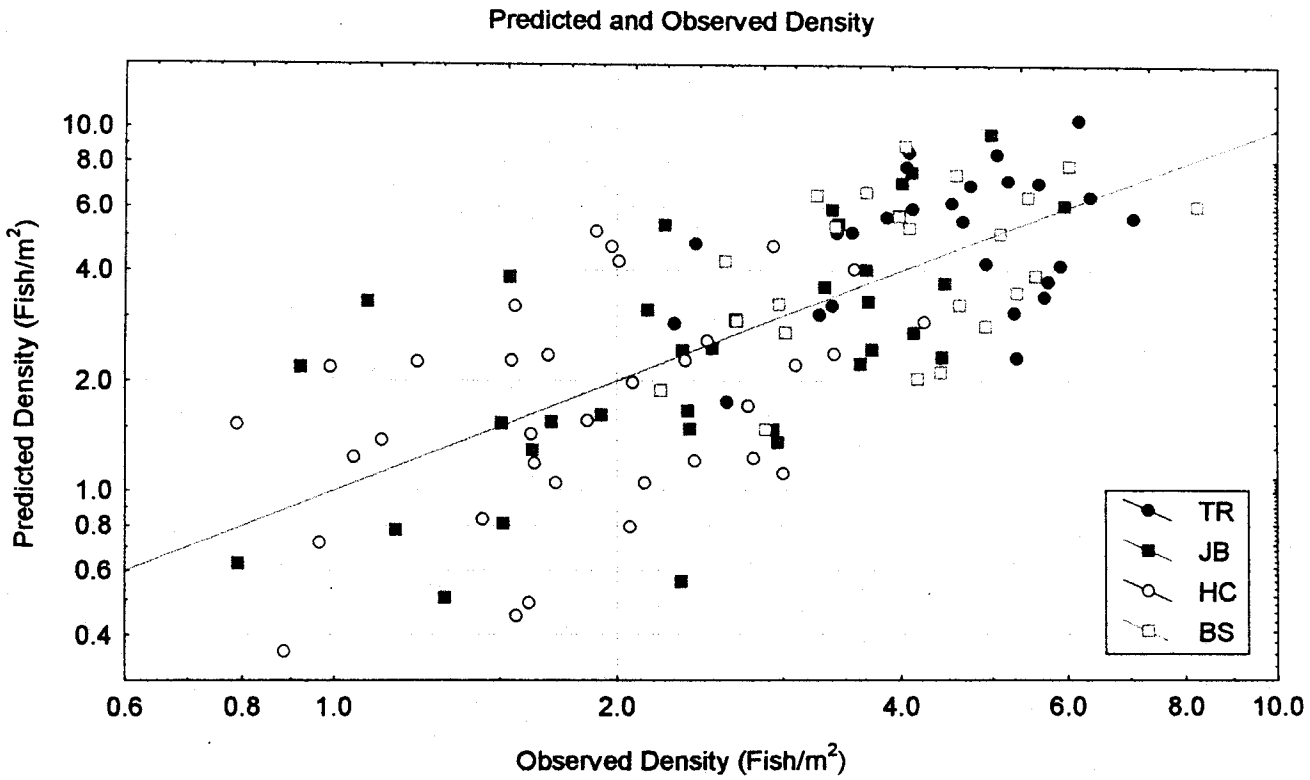


Figure D.8 Log-Log plot of predicted and observed (stratified mean per m^2) density of fishes for each sample by site.

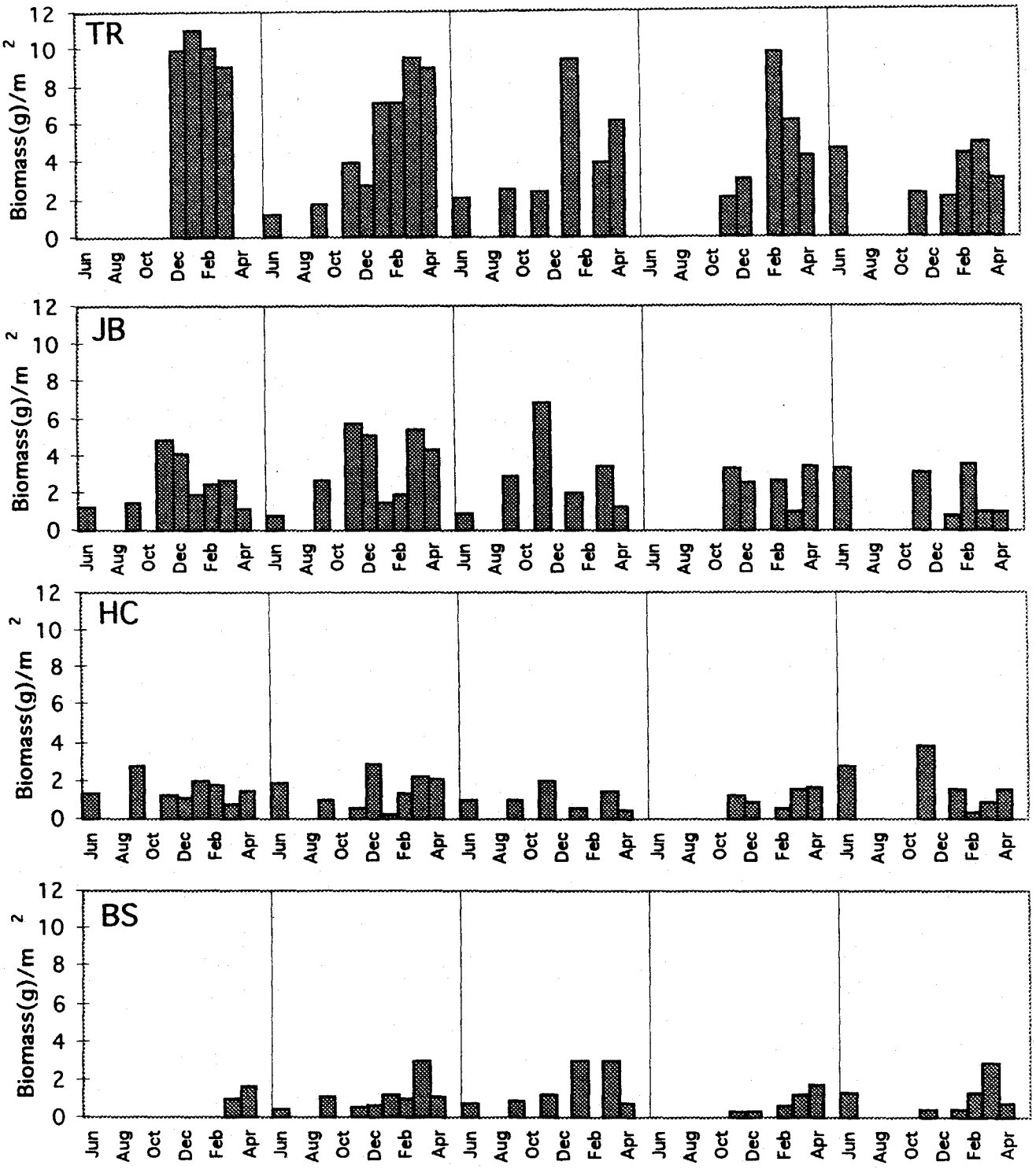


Figure D.9 Stratified mean biomass of fish for every sample collection. Sites ranked by biomass are TR>JB>HC>BS and sites are all significantly different from each other. Sampling did not begin at TR and BS until December 1991 and March 1992 respectively. Ideally, samples were scheduled for June, September and monthly from November through April, however not all months were sampled every year.

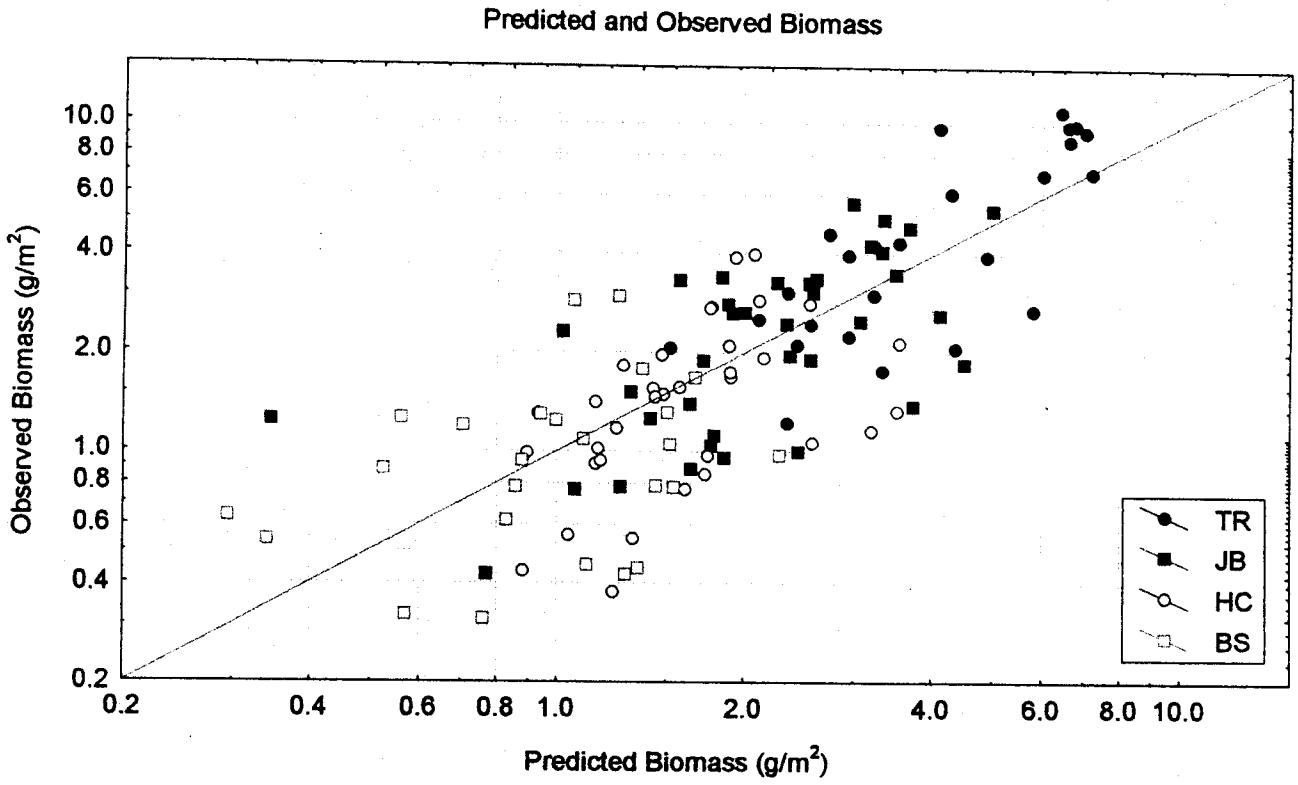


Figure D.10 Log-Log plot of predicted and observed (stratified mean per m^2) biomass of fishes for each sample by site.

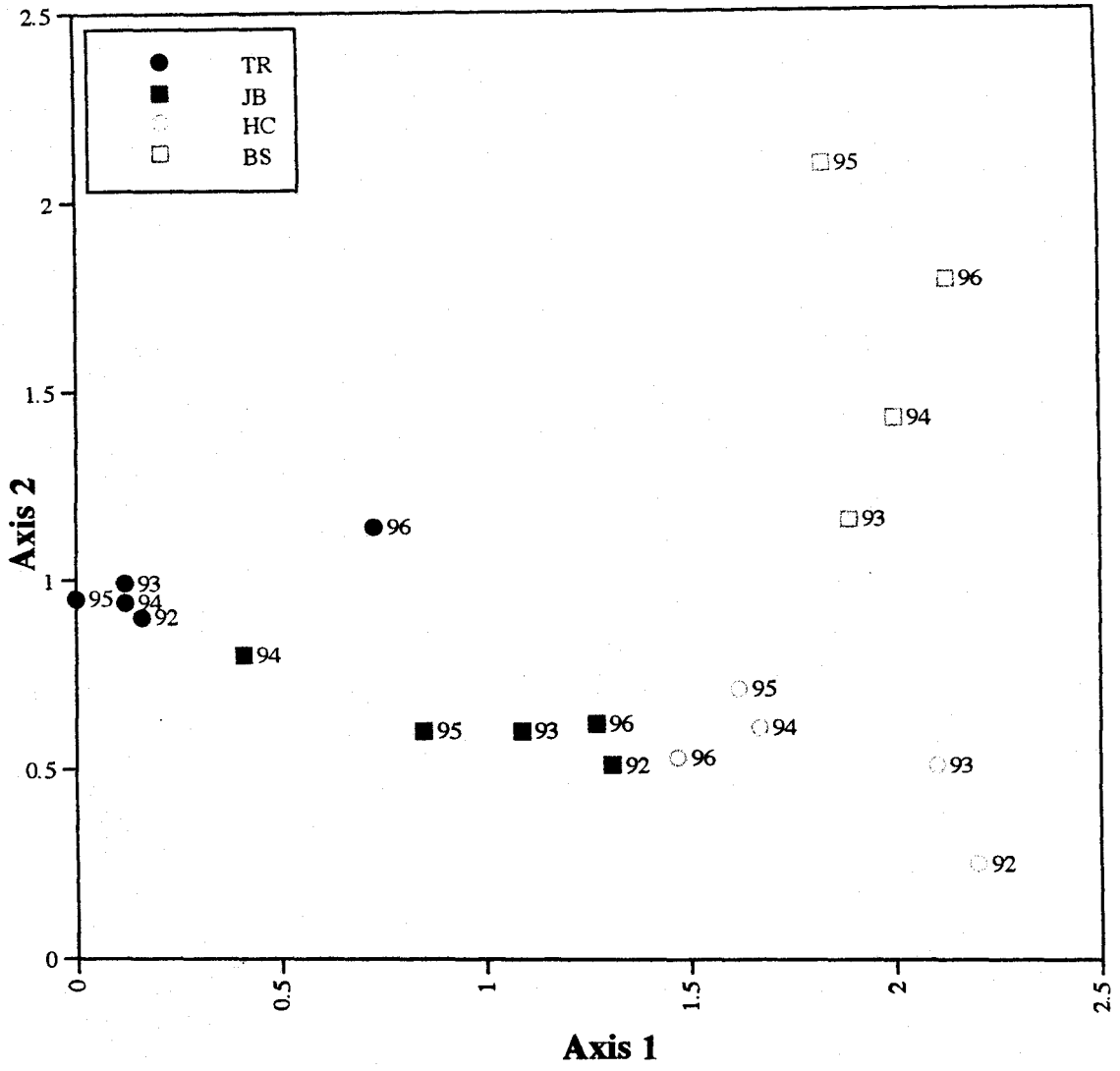


Figure D.11 Plot of Detrended Correspondence Analysis Axis 1 and Axis 2 scores for annual collections at four sampling sites. Axis 1 and axis 2 account for 45.2% and 14.0% of the variation in community structure respectively. Axis 1 separated sampling sites by the number of low salinity days and the length of the longest low salinity period. Axis 2 was associated with several parameters, half of which were estimators of salinity.

Appendix E. Test 7 Year 2 Ecological Monitoring Results: 1996-1997. An Analysis of the Hydrology and Resident Fishes within the Coastal Mangrove Wetlands of Everglades National Park

Jerome J. Lorenz, John Paul McLendon, and Craig H. Faunce

ABSTRACT

The impact of Test 7 operations on the hydrology, hydrography and ecology of the mangrove wetlands of northeastern Florida Bay was examined for the hydrologic year 1996-97. An evaluation of 20 years of rainfall data indicated that 1993-94 was spatially, temporally and quantitatively similar to 1996-97. Test 7 was initiated after the 1995 dry season and therefore, a comparison of these two years allows for a classic before and after analysis. Analyses of water level and salinity patterns between the two years indicated differences between years. Differences in hydrology and hydrography resulted in apparent differences in fish abundance and community structure. It was not clear whether the differences in water level, salinity and the fish community could be attributed to Test 7 or were the result of other, more significant changes in the operation of the SDCS. However, it is unlikely that Test 7 operations resulted in the observed differences because the substantive changes in operation were to occur during phase two of Test 7 and phase two has never been implemented. Furthermore, Test 7 was suspended in November 1996 when Hurricane Lily threatened south Florida. Over a five day period, much of the regions water supply was pumped to tide even though the hurricane never made landfall. Based on these observations, we conclude that it is unlikely that Test 7 had any appreciable impact on northeastern Florida Bay because Test 7 was not implemented.

1. INTRODUCTION

Implementation of Test Iteration 7 of the Experimental Program of Water Deliveries to Everglades National Park (ENP) officially began October 1, 1995 (USACOE 1995). Under the auspices of the Test 7 monitoring program, the charge was to evaluate

the relative impact of Test 7 on the fishes of the coastal mangrove wetland that makes up the transition zone between the fresh water environs of the Taylor Slough/C-111 basins and Florida Bay. This report evaluates the impact of Test 7 during the period of June 1996 to May 1997. Hydroperiod and salinity of mangrove sites are affected by both rainfall and water management (Appendices A and D). The strategy used in this report to evaluate Test 7 was to identify a year similar in rainfall pattern to the subject year (1996-97). Once a comparable rainfall year had been identified, comparisons of mangrove hydrology and aspects of the fish community were made between the years to see if the Test 7 year was different.

Statistical analysis. Critical regions for all Analyses of variance (ANOVA) were set at the traditional $p<0.05$. Multiple means separations were performed for each significant ANOVA. Unless otherwise indicated, the critical region for least squares means post hoc tests was set at $p<0.01$ thus reducing the likelihood of Type I errors (Sokal and Rohlf 1980). The post hoc test used was Tukey HSD test for unequal sample sizes (Statsoft 1995).

2. RAINFALL COMPARISONS BETWEEN YEARS

The National Oceanic and Atmospheric Administration operates rain collection gages at 26 locations across southern Florida (Table E.1) and publishes the data in annual summaries for the state. Analysis of Variance was used to analyze twenty years (1978-1997) of total annual (June-May) rainfall data from the 26 stations (i.e., one datum per year per location) in an effort to identify years with spatially similar annual rainfall patterns to 1996-97.

Although the total quantity of rainfall across south Florida is critical to understanding hydropatterns in the southern Everglades, the timing of rainfall is just as important when making comparisons between years. Correspondence Analysis (CA) (ter Braak 1995) was performed on mean monthly rainfall averaged across the 26 locations (i.e., one datum per month) in an effort to analyze intra-annual rainfall patterns from years that ANOVA identified as having similar spatial patterns to 1996-97.

Results and Discussion. Results of the ANOVA of annual rainfall indicates that there was a significant year effect (F_{18}=16.42, $p<0.001$). The results of *post hoc* analysis of the least squares means (Figure E.2) indicated that seven out of the 19 years were not significantly different ($p<0.01$) from 1996-97 in total rainfall across southern Florida.

To determine similarities in temporal rainfall patterns among these 8 years (1996-97 and seven similar years), CA was performed on the mean monthly rainfall from all 26 collection locations. The primary and secondary axes accounted for 33% and 25% of the temporal variability in rainfall across southern Florida, respectively. In essence, the CA ordination technique condenses a distribution of data into a single point in 2 (or occasionally 3) dimensional space. When plotted, points that are relatively close to each other represent distributions with similar patterns. Figure E.3a indicates that 1993-94 was similar in monthly rainfall distribution to 1996-97.

The results of correspondence analyses are somewhat subjective in that similarities and differences are relative to the distributions included in the analyses. Figure E.3a indicates that 1996-97 was more similar to 1993-94 than to any other of the 6 years used in the analysis, however, it does not actually indicate how similar the two years were in rainfall patterns. Direct comparisons of temporal changes can be made between the two years through a two-way ANOVA of year and month across the 26 sampling sites. The results indicate a significant interaction ($F_{11,541}$=5.48, $p<0.01$), i.e., the two years were significantly different in some aspect of the temporal rainfall pattern. The results of the least squares means *post hoc* tests (Figure E.3b) indicate that the two years were, overall, very similar in temporal rainfall pattern with only two months showing significant differences ($p<0.01$). 1996-97 had higher rainfall in June while 1993-94 had higher rainfall in July. Since the two months were consecutive and the differences between the two years over these months offset one another, it would be reasonable to conclude that the two years were very similar in overall rainfall patterns.

3. WATER LEVEL AND SALINITY

Introduction. The combined results of the Analyses of Variance (Figure E.2, Figure E.3b) and the Correspondence Analysis (Figure E.3a) of rainfall strongly indicate

that 1996-97 and 1993-94 were very similar in rainfall intensity on both temporal and spatial scales. This similarity potentially allows for the examination of the impacts of Test 7 through a classic before/after analysis of dependent physical and biological variables. In this case, 1993-94 represents before and 1996-97 after Test 7 initiation. Since Test 7 was designed to impact the Taylor Slough/C-111 basins but would not impact the area east of US-1, the BS site can be considered a control while TR, JB and HC are experimental sites. The main assumption of this design is that, in the absence of changes in water management practices, years with similar rainfall patterns should result in similar salinity and water level patterns in the mangrove zone. Therefore, any observed differences in salinity and water level between 1993-94 and 1996-97 would be the result of changes in water management practices. The null hypothesis that the coastal mangrove wetlands did not differ in physical attributes (i.e., salinity and water level) between 1993-94 and 1996-97 at any of the four sites will be evaluated in this section. Should the null hypotheses be rejected, a reasonable conclusion might be to attribute any differences in physical parameters between the two years at the experimental sites to the implementation of Test 7.

It should be recognized that the main assumption of the null hypothesis implicitly states that differences between years would be caused by changes in management practices and not specifically changes attributable to Test 7. This distinction is made because other changes in the operation of the canal system occurred between 1993 and 1997 outside of Test 7 being implemented. Specifically, in November of 1996, S-197 (the control structure that allows water from C-111 to flow into southern Biscayne Bay) was fully opened in preparation for the impact of Hurricane Lily (Thomas Van Lent, ENP, Pers. Comm.). The justification used to open the structure was to mitigate flooding caused by the intense rainfall that was expected to occur with the storm. Even though Hurricane Lily never made landfall, the gated culverts at S-197 were left open for five days. The result was the effective lowering of the water table by as much as 1.5 ft (Thomas van Lent, ENP, Pers. Comm.). The effective impact of this event was the immediate depletion of water stores that would have provided fresh water flow to Florida Bay throughout the upcoming dry season. The impact of this single event was so dramatic that it probably

masked any of the subtle impacts that may have resulted from the relatively anemic design changes of Test 7 phase 1.

Furthermore, the main assumption (that all observed changes would be caused by water management) may not be fully accurate. For example, wind speed and direction have been shown to be causal agents in determining mangrove water levels, especially during the dry season (Holmquist et al 1987, Lorenz 1997). Although such events would be relatively short lived and the impact negligible when comparisons are made over a full year, the combined impact of non management related impacts can not be fully discounted. These and other alternative explanations for observed differences in mangrove zone parameters will discussed in more detail below.

Methods. The methods for the collection of water level and salinity data are presented in the main text of this report. Water level and salinity were analyzed using a 3 way ANOVA for the effects of site, year, and month for 1996-97 and 1993-94.

Results. The ANOVA of salinity revealed significant two-way interactions between month and year ($F_{11,2789}$=229.8, $p<0.01$) and between site and year ($F_{3,2789}$=49.3, $p<0.01$). Means separations of the month and year interaction (Figure E.4a) indicated that during most of the year (July through February), 1996-97 trended toward lower salinity than 1993-94, however, only two of the months were significant (July and October; $p<0.01$). During the late dry season, the trend dramatically reversed with 1993-94 having much lower salinity through March, April and May ($p<0.01$). The *post hoc* tests for the site and year interaction indicated that mean salinity was higher at the three experimental sites (TR, JB and HC) following initiation of Test 7 while the control site (BS) remained unchanged (Figure E.4b).

The trends in salinity were supported by a significant three way interaction between site, month, and year ($F_{33,2789}$=20.3, $p<0.01$). All four sites showed at least one month between June and February where salinity was significantly lower during the 1996-97 hydrologic year (Figure E.5). TR and JB results also indicate that the fresh water period (zero salinity) was longer in duration during 1996-97 than in 1993-94 (Figure E.5). However, all four sites also had much higher salinities from March through May 1997 (Figure E.5). The ANOVA of water level revealed a significant two-way interaction

between site and year ($F_{3,2746}$=39.3, $p<0.01$). The *post hoc* tests indicated that mean annual water level was higher at JB but lower at HC during 1996-97 when compared to 1993-94 (Figure E.6). A significant three way interaction between site, month and year ($F_{33,2746}$=6.87, $p<0.01$) indicated that, in general, all the sites had significantly higher water for some or all of the months during the late dry season (March-May) of 1996-97 (Figure E.7). Furthermore, the hydroperiod (defined as the period of time water level was above 5 cm relative depth as this is the stage at which the flats begin to go dry) is different among the sites with TR and JB having longer hydroperiods in 1996-97, HC having longer hydroperiod in 1993-94 and BS remaining unchanged.

Discussion. Under current conditions, Test 7 appears to have resulted in higher mean salinity in the mangrove zone. This increase seems to be fully explained by higher mean salinities during the late dry season of 1997. Results from month, year and site interaction indicated that 1996-97 had lower salinity during the wet season but higher salinity during the late dry season. It is possible that, under Test 7, water delivery schedules were more effective at providing fresh water to the estuary during the wet season and not as effective during the dry season. It is also possible that Test 7 operations were so effective at conveying water toward Florida Bay that water stores were depleted by the late dry season. These seem unlikely given that only minor changes were made to the system under phase 1 of Test 7.

Another possible explanation has little to do with water management. Differences between the two years in the strength and direction of the wind during March - May may account for the observed contrast in salinity. Strong dry season winds result in bay water being pushed into the mangrove zone, consequently increasing salinity. Greater strength or frequency of such wind events would result in higher overall salinities in the mangrove zone. Wind events would also be expected to raise water levels. Therefore, the observation of higher water levels (Figure E.7) concurrent with the high salinity period (Figure E.5) support this possibility. However, a cursory examination of wind data during the months of March through May indicated that wind mixing was probably more likely to have occurred during 1993 as the famous 'Century Storm' occurred during this period (Lorenz and Harrington 1994).

The most plausible explanation for higher observed salinity during 1997 concerns the Hurricane Lily event. It is possible that Test 7 may have been slightly more effective at delivering fresh water, as indicated by lower wet season salinity. However, this trend was masked during the late dry season because of preparations for a storm that never arrived. The opening of S-197 during the storm threat resulted in water stores being depleted by March thus explaining the subsequent high salinities found in the mangrove zone. The higher water levels could be explained by a higher Florida Bay water levels for a variety of reasons (Holmquist et al. 1989, Pattullo 1963). As a result of this event, the impact of Test 7 on mangrove salinities can not be fully evaluated at this time.

One of the goals of Test 7 was to redistribute fresh water from upstream sources (Taylor Slough and C-111 canal) more evenly across the ecotonal region (USACOE 1995). Environmental data suggest this may have been accomplished in 1996-97. In 1993-94, salinity remained low at the eastern most site (HC) during the late dry season while at the western site (TR) salinity increased substantially in April and May. The centrally located site (JB) exhibited a trend intermediate between the two. In 1996-97, all three sites had very similar rise in salinity late in the wet season (Figure E.5). Comparisons of mean water levels between sites provides further evidence for this conclusion: in 1996-97, water levels were lower at HC but higher at JB than in 1993-94 (Figure E.6), possibly indicating that greater fresh water flow was reaching areas west of US-1. Hydroperiods were also longer in 1996-97 at TR and JB (possibly indicating increased fresh water to these areas) while hydroperiod was shorter at HC. Hydroperiod length remained the same at BS. These results may indicate that the east to west gradient in fresh water flow has been mediated. It is not clear whether Test 7 was responsible for this result since several physical and operational changes were made between 1993 and 1997. Not the least of these changes was the back filling of the eastern most gaps in the C-111 so that water exited across a longer stretch of the canal.

4. IMPACT ON MANGROVE FISHES

Introduction. Although analyses of the impact of Test 7 on water level and salinity were inconclusive as to whether the two years were different, an examination of

the fish community could help clarify if any differences did occur. Previous analyses indicated that fish abundance and community structure are linked to salinity and water level (Appendix D). Based on this finding, the null hypothesis tested in this section is that the coastal mangrove wetlands the fish community (fish abundance and community structure) did not differ between 1993-94 and 1996-97 at any of the four sites. Should the null hypotheses be rejected, a reasonable conclusion might be to attribute any differences in these biological parameters between the two years at the experimental sites to the implementation of Test 7.

Methods. The methods for the collection of fish samples are summarized in the main text of this report and presented in detail in Appendix A. As described in the main text of this report, standardized numerical manipulations were performed on the data in preparation for statistical analyses. Estimates of density and biomass per square meter of wetland for each of the two years were examined with ANOVA and CA.

Results. A thorough presentation of each sample collection is presented in Appendices B and C. The percent of catch by site for all species collected is presented for 1993-94 in Table E.2 and for 1996-97 in Table E.3. Total percent for all sites combined, total number of species and individuals collected, and total sampling effort are also provided in these tables. Rainwater killifish (Lucania parva) and Mayan cichlids (Cichlasoma urophthalmus) showed the greatest decrease in percent catch from 1993-94 to 1996-97 while mosquitofish (Gambusia holbrooki) and sailfin molly (Poecilia latipinna) showed the greatest increase. The number of fish collected in 1996-97 was double the amount collected in 1993-94 and the number of species was 36 compared to only 29.

Analysis of variance indicated a significant difference in density of fish ($F_{1,46}$=4.0, p=0.05) with 1993-94 averaging 3.99 fish per m^2 (SE=0.48) and 1996-97 averaging 6.99 fish per m^2 (SE=1.42). There was also a significant interaction between site and year (Figure E.8a; $F_{3,40}$=7.69, p<0.01). The test for an interaction between years and month was not significant, however a plot of the means (Figure E.8b) possibly indicated a trend toward increasing fish density during the dry season of 1996-97 while density decreased over the same period in 1993-94.

Analysis of variance of biomass per m^2 revealed no significant differences between years or months within sites. Plots of mean biomass and standard errors are presented to demonstrate that biomass was similar both spatially (Figure E.9a) and temporally (Figure E.9b) between the two years.

The primary and secondary axis of the CA explained for 46% and 32% of the variability in community structure between sites and years (Figure E.10). The ordination scores fall into three groups as indicated in Figure E.10. The primary axis most strongly defines differences between BS and the other three sites. The secondary axis is defined by differences in the two years among the experimental sites, however, the community at HC in 1993-94 closely resembles the community at all three experimental sites in 1996-97.

Discussion. The greater number of total fish collected and number of species in 1996-97 over 1993-94 can be accounted for by increases at 2 of the sites: in 1996-97 total catch more than tripled at TR and more doubled at JB (Tables 2 and 3). While sampling effort was higher during 1996-97, the interaction between site and year for density indicated that the increases observed at TR and JB were dramatic even when sampling effort was standardized (Figure E.8). Increases in sheepshead minnow (Cyprinodon variegatus), mosquitofish and sailfin molly principally accounted for the overall increase in total fish numbers at these two sites (Tables 2 and 3).

The results of the CA indicate the great sensitivity of community structure to changes in hydrology. Clearly the experimental sites (TR, JB and HC) exhibited dissimilar hydrologic and hydrographic patterns in 1993-94 (Figure E.5 and 6) and the community analyses indicated the three sites varied greatly in community composition (Figure E.10). However, in 1996-97, when temporal patterns in water level and salinity were very similar across the sites, the fish community at the sites converged and became similar.

The analysis of the fish community indicates that a redistribution of flows to the ecotone occurred between 1993-94 and 1996-97 (as speculated in the previous section) and that this change had an impact on the biota. A redistribution of water delivery patterns on the west side of US-1 should have had little impact on the hydrology east of the highway. The results of the CA indicate that the community structure at BS (east of US-1) was almost identical between the two years. However, at the experimental sites

(west of US-1) we would anticipate major changes between the two years. In 1993-94, the spatial disparity in the delivery of fresh water to the mangrove zone resulted in dissimilar physical conditions at the sites. We would therefore expect very different communities suited to the unique physical parameters at each site. However, with a more equitable distribution of water (as in 1996-97), conditions on the sites would become similar resulting in a more cosmopolitan community structure. The ordination plot from the CA reflects these anticipated results. Although the community structure at HC in 1993-94 was very similar to the common structure found at all 3 sites in 1996-97, this might have been anticipated since HC was the site receiving the most fresh water in 1993-94.

Previously, mangrove fish density was demonstrated to be partially determined by length of hydroperiod (Appendix D). Comparisons of density and water level between the two years support this finding. Mean fish density per month across all sites indicated that density continued to increase during the dry season in 1996-97 but decreased over the dry season in 1993-94 (although the relationship was not significant). Both TR and JB had hydroperiods that extended through the dry season in 1996-97 and these two sites account for the overall increase in fish density. BS (the control site) had about the same hydroperiod length and fish density between the two years. Inconsistent with this trend was that the shorter hydroperiod at HC during 1996-97 did not result in lower density overall, as would have been expected. This inconsistency is explained by the fact that HC had relatively short hydroperiods in both years when compared to the other sites. Simply stated, neither year had a long enough hydroperiod at HC to recruit large quantities of new fish into the community (Appendix D). This may also be the reason why HC had the lowest mean density of all the sites. As implied in the previous paragraph, the changes in water level and the resultant changes in fish density are probably not a direct result of Test 7 influences but may be a product of a more equitable distribution of fresh water flow across the northeastern coast of Florida Bay in 1996-97.

In stark contrast to the temporal and spatial changes observed in fish density, fish biomass per m^2 remained basically unchanged between the two years. Mean biomass remained unchanged at all four sites and the temporal pattern of change remained about

the same for both years. Biomass production has been shown to be related to long term salinity patterns (Appendix D). There are two components of long term salinity patterns that determine this relationship. Increased duration of low salinity (<8ppt) periods is positively correlated with increased fish biomass while increased annual variability has a negative effect (Appendix D, Montague and Ley 1993, Ley 1992). At the three experimental sites, 1996-97 was characterized by longer low salinity periods but also had greater salinity variability. These conditions may have had a palliative impact on the response of biomass to salinity. The resulting situation was that production of biomass was very similar between the two years.

5. SYNTHESIS, CONCLUSIONS, AND SUMMARY

The combined results of the temporal and spatial analyses of annual rainfall patterns strongly indicated that 1993-94 was very similar to the subject year (1996-97). Comparisons of mangrove characteristics between the two years was used to evaluate Test 7. Hydrology and fish abundance were evaluated and significant differences found between the two years. Although Test 7 was expected to increase fresh water flow to the mangrove zone, only phase 1 of the test had been implemented. Since the substantive changes were to occur in phase 2, it is doubtful that the observed differences in hydrology and fish fauna are purely a result of Test 7.

Differences in salinity and water level patterns between the two years may indicate that the long standing problem of inequities in fresh water distribution between the C-111 and Taylor Slough basins has been resolved. It is not clear whether Test 7 was fully or even partially responsible for this result since several physical and operational changes were made in this regard between 1993 and 1997. Not the least of which was the back filling of the eastern most gaps along the southern reach of the C-111 canal. An expected consequence was that, in 1993-94 the sites had very different communities suited to the unique physical parameter at each site. In 1996-97, with a more equitable distribution of water, conditions on the sites become similar and the community structure of the sites was very similar.

Previously, mangrove fish density was demonstrated to be partially determined by length of hydroperiod (Appendix D). Comparisons of density and water level between the two years support this finding. As implied in the previous paragraph, the changes in water level and the resultant changes in fish density are probably not a direct result of Test 7 influences but are rather a product of a more equitable distribution of fresh water flow across the northeastern coast of Florida Bay in 1996-97.

Analysis of hydrologic conditions indicated that 1996-97 had lower salinity during the wet season but higher salinity during the late dry season when compared to 1993-94. It is possible that Test 7 was responsible for the lower salinities during the wet season, however, the most plausible explanation for higher observed salinity during the dry season of 1997 concerns the opening of structure S-197 during the Hurricane Lily threat. This event resulted in water stores being depleted by March thus explaining the subsequent high salinities found in the mangrove zone.

Biomass production in mangrove fishes has been shown to be related to long term salinity patterns. Fish biomass remained unchanged between the two years. The two opposing salinity parameters between the years (longer periods of low salinity possibly due to Test 7 and greater variance in annual salinity due to the opening of S-197) had canceling effects on the fish community, thereby explaining why biomass was very similar even though salinity patterns were different.

The results from the analyses of community structure and fish density were very similar to what might have been predicted from previous findings and indicate that this monitoring program has a high degree of sensitivity to changes in hydrology and the resultant biotic changes. The lack of observed change in biomass was authentic and does not indicate a short fall of the monitoring program. Rather, this outcome likely resulted from contradictory water management protocols implemented with in the same year.

6. LITERATURE CITED

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Table E.1. NOAA rainfall gage locations

Everglades Division	Lower East Coast Division
Belle Glade	Coral Springs
Canal Point	Ft Lauderdale
Clewiston	Hialeah
Devils Garden	Homestead
Everglades	Loxahatchee
Flamingo	Miami Beach
Fort Myers	Miami Airport
Immokalee	Perrine
La Belle	Pompano Beach
Moore Haven	Royal Palm
Naples	Stuart
Oasis	West Palm Beach
Punta Gorda	
Tamiami	

Table E.2. Phylogenetic list of all species collected at all four sites in 1993-94 and the percent of catch at each site. Species used in the community analysis (CA) are marked with an asterisk (*).

ORDER Family Genus species	Common Name	TR	JB	HC	BS	Total
SILURIFORMES						
Ictaluridae	Freshwater catfish					
Ameiurus natalis	Yellow Bullhead					0
Noturus gyrinus	Tadpole Madtom					0
Clariidae	Labyrinth catfishes					
Clarias batrachus	Walking Catfish		0.05			0.02
BATRACHOIDIFORMES						
Batrachoididae	Toadfishes					
Opsanus beta (juv)	Gulf Toadfish				0.31	0.07
ATHERINIFORMES						
Atherinidae	Silversides					
Menidia sp*	Inland Silverside	5.28	3.01	1.17	4.83	3.53
Belonidae	Needlefishes					
Strongylura notata (juv)	Redfin Needlefish				0.38	0.08
Cyprinodontidae	Killifishes					
Adenia xenica	Diamond Killifish			3.24	1.00	0.98
Cyprinodon variegatus*	Sheepshead Minnow	1.65	9.07	42.58	17.79	17.06
Floridichthys carpio*	Goldspotted Killifish		0.05	2.21	31.29	7.23
Fundulus chrysotus	Golden Topminnow	0.26	0.11			0.10
F. confluentus*	Marsh Killifish		6.17	22.64	0.46	7.33
F. grandis<6.5cm *	Gulf Killifish			0.69	0.08	0.18
F. grandis>6.5cm	Gulf Killifish		0.44	1.66	0.31	0.59
F. Seminolus	Seminole Killifish					0
F. similis<6.5cm	Longnose Killifish					0
F. similis>6.5cm	Longnose Killifish					0
Heterandria formosa*	Least Killifish					0
Jordinella floridae*	Florida Flagfish		0.05	0.35		0.10
Lucania goodei*	Bluefinned Killifish	5.02	2.62			2.03
Lucania Parva*	Rainwater Killifish	51.12	31.31	11.25	13.27	27.60
Poeciliidae	Livebearers					
Belonesox belizanus	Pike Killifish	0.33	0.71			0.30
Gambusia affinis*	Mosquitofish		1.97	4.42	0.38	1.72
Poecilia latipinna*	Sailfin Molly	5.15	6.89	4.76	3.91	5.31
CYPRINIFORMES						
Cyprinidae	Minnows					
Notropis sp	Shiner					0
GASTEROFORMES						
Syngnathidae	Pipefishes					
Syngnathus louisianae	Chain Pipefish				0.08	0.02
PERCIFORMES						
Gerreidae<6.5cm	Mojarras	0.13	0.05		2.30	0.54

Gerreidae>6.5cm	Mojarras				0.08	0.02
Gobiidae	Gobies					
Gobiosoma bosc	Naked Goby	0.07				0.02
Lophogobius cyprinoides	Crested Goby					0
Microgobius gulosus*	Clown Goby	6.27	0.98	0.14	23.39	6.89
Centrarchidae	Sunfish spp.	0.07	1.04			0.33
Elassoma evergladi	Pygmy Sunfish	0.13				0.03
Lepomis gulosus	Warmouth					0
L. marginatus	Dollar Sunfish	0.07				0.02
L. punctatus	Spotted Sunfish	0.07				0.02
L. macrochirus	Bluegill					0
Micropterus salmoides	Largemouth Bass	0.20				0.05
Cichlidae	Cichlids					
Cichlasoma bimaculatum	Black Acara		0.05	0.14		0.05
C. urophthalmus<6.5cm*	Mayan Cichlid	21.00	29.13	4.35		14.99
C. urophthalmus>6.5cm	Mayan Cichlid	2.51	4.64	0.28		2.08
Tilapia mariae	Spotted Tilapia	0.66	1.64	0.13		0.69
PLEURONECTIFORMES						
Soledae	Soles					
Trinectes maculatus	Hogchoker				0.15	0.03
TOTALS		1514	1830	1449	1304	6097
NUMBER OF SPECIES		17	18	14	16	29
NUMBER OF NETS SAMPLED		33	29	27	35	124
NUMBER OF DATES SAMPLED		6	6	6	6	24

Table E.3. Phylogenetic list of all species collected at all four sites in 1996-97 and the percent of catch at each site. Species used in the community analysis (CA) are marked with an asterisk (*).

ORDER Family Genus species	Common Name	TR	JB	HC	BS	Total
SILURIFORMES						
Ichtaluridae	Freshwater catfish					
Ameiurus natalis	Yellow Bullhead		0.03			0.01
Noturus gyrinus	Tadpole Madtom		0.08			0.02
Clariidae	Labyrinth catfishes					
Clarias batrachus	Walking Catfish			0.16		0.02
BATRACHOIDIFORMES						
Batrachoididae	Toadfishes					
Opsanus beta (juv)	Gulf Toadfish				0.48	0.06
ATHERINIFORMES						
Atherinidae	Silversides					
Menidia sp*	Inland Silverside	1.44	0.33	3.41	1.04	1.24
Belonidae	Needlefishes					
Strongylura notata (juv)	Redfin Needlefish			0.08	0.14	0.02
Cyprinodontidae	Killifishes					
Adinia xenica	Diamond Killifish		0.03	0.63	0.14	0.09
Cyprinodon variegatus*	Sheepshead Minnow	15.97	14.79	55.04	15.77	19.57
Floridichthys carpio*	Goldspotted Killifish			0.40	33.75	4.01
Fundulus chrysotus	Golden Topminnow	0.72	0.67	0.08		0.55
F. confluentus*	Marsh Killifish	3.17	5.50	8.88	0.28	4.15
F. grandis<6.5cm *	Gulf Killifish		0.26	0.32	7.95	1.05
F. grandis>6.5cm	Gulf Killifish	0.02	0.36	0.87	2.35	0.49
F. Seminolus	Seminole Killifish	0.07				0.03
F. similis<6.5cm	Longnose Killifish				2.70	0.32
F. similis>6.5cm	Longnose Killifish				1.18	0.14
Heterandria formosa*	Least Killifish	2.57	2.97			2.13
Jordinella floridae*	Florida Flagfish	1.21	4.96	0.16		2.15
Lucania goodei*	Bluefinned Killifish	1.95	1.23	1.43		1.44
Lucania Parva*	Rainwater Killifish	9.55	21.14	8.17	13.97	13.61
Poeciliidae	Livebearers					
Belonesox belizanus	Pike Killifish	0.05	0.08			0.05
Gambusia affinis*	Mosquitofish	35.41	28.92	12.37	0.83	26.92
Poecilia latipinna*	Sailfin Molly	20.34	12.23	3.49	1.73	13.85
CYPRINIFORMES						
Cyprinidae	Minnows					
Notropis sp	Shiner		0.02			0.01
GASTEROFORMES						
Syngnathidae	Pipefishes					
Syngnathus louisianae	Chain Pipefish				0.07	0.01
PERCIFORMES						
Gerreidae<6.5cm	Mojarras		0.03	0.63	5.12	0.67
Gerreidae>6.5cm	Mojarras			0.08		0.01

Gobiidae	Gobies					
Gobiosoma bosc	Naked Goby		0.15			0.05
Lophogobius cyprinoides	Crested Goby	0.05		0.08		0.03
Microgobius gulosus*	Clown Goby	3.38	0.20	0.56	12.17	3.11
Centrarchidae	Sunfish spp.	0.04	0.05	0.08		0.04
Elassoma evergladi	Pygmy Sunfish					0
Lepomis gulosus	Warmouth		0.03			0.01
L. marginatus	Dollar Sunfish	0.58	0.18			0.33
L. punctatus	Spotted Sunfish	0.46	2.07	0.56		0.93
L. macrochirus	Bluegill		0.10	0.08		0.04
Micropterus salmoides	Largemouth Bass					0
Cichlidae	Cichlids					
Cichlasoma bimaculatum	Black Acara					0
C. urophthalmus<6.5cm*	Mayan Cichlid	2.60	3.28	2.38	0.14	2.50
C. urophthalmus>6.5cm	Mayan Cichlid	0.12	0.20			0.12
Tilapia mariae	Spotted Tilapia	0.28	0.05			0.15
PLEURONECTIFORMES						
Soledae	Soles					
Trinectes maculatus	Hogchoker		0.10		0.14	0.05
TOTALS		5687	3908	1261	1446	12302
NUMBER OF SPECIES		20	26	22	18	36
NUMBER OF NETS SAMPLED		46	48	47	48	189
NUMBER OF DATES SAMPLED		8	8	8	8	32

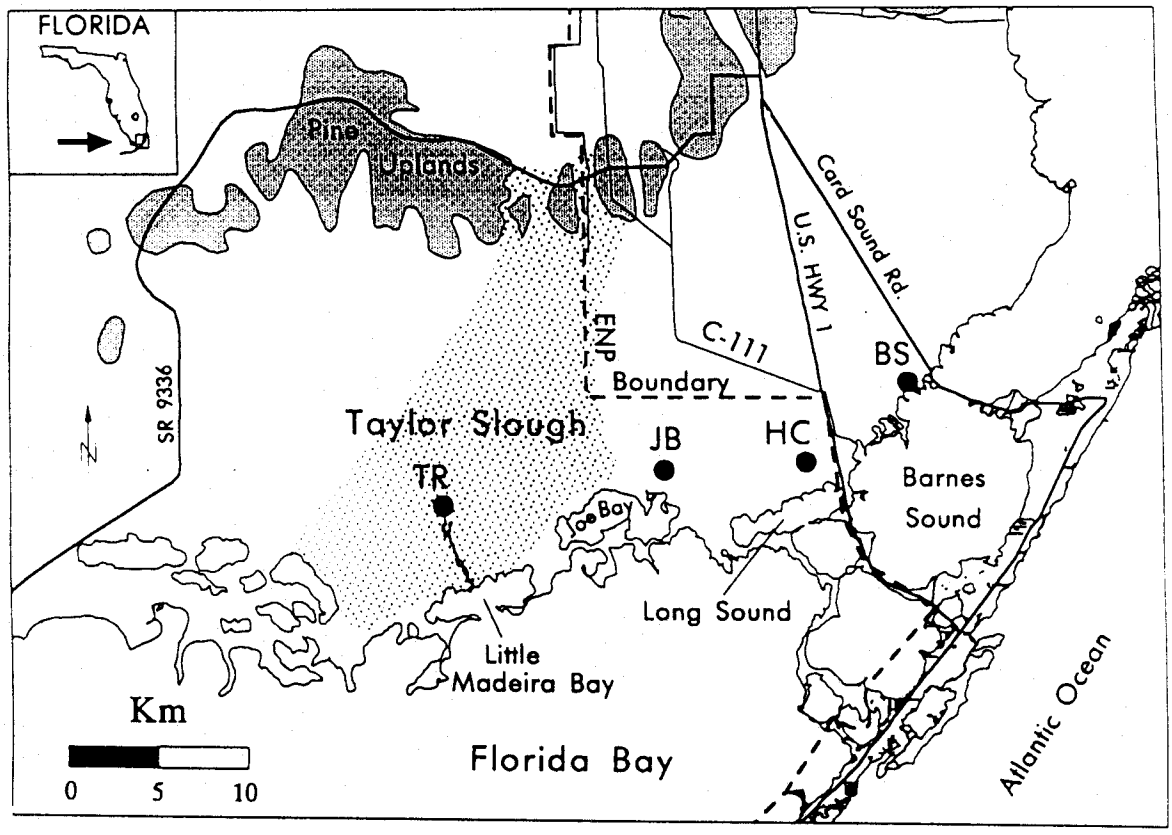


Figure E.1. Map of southern Florida indicating the four mangrove zone collection sites, Taylor Slough, C-111 canal, U.S. Highway 1, and Card Sound Road.

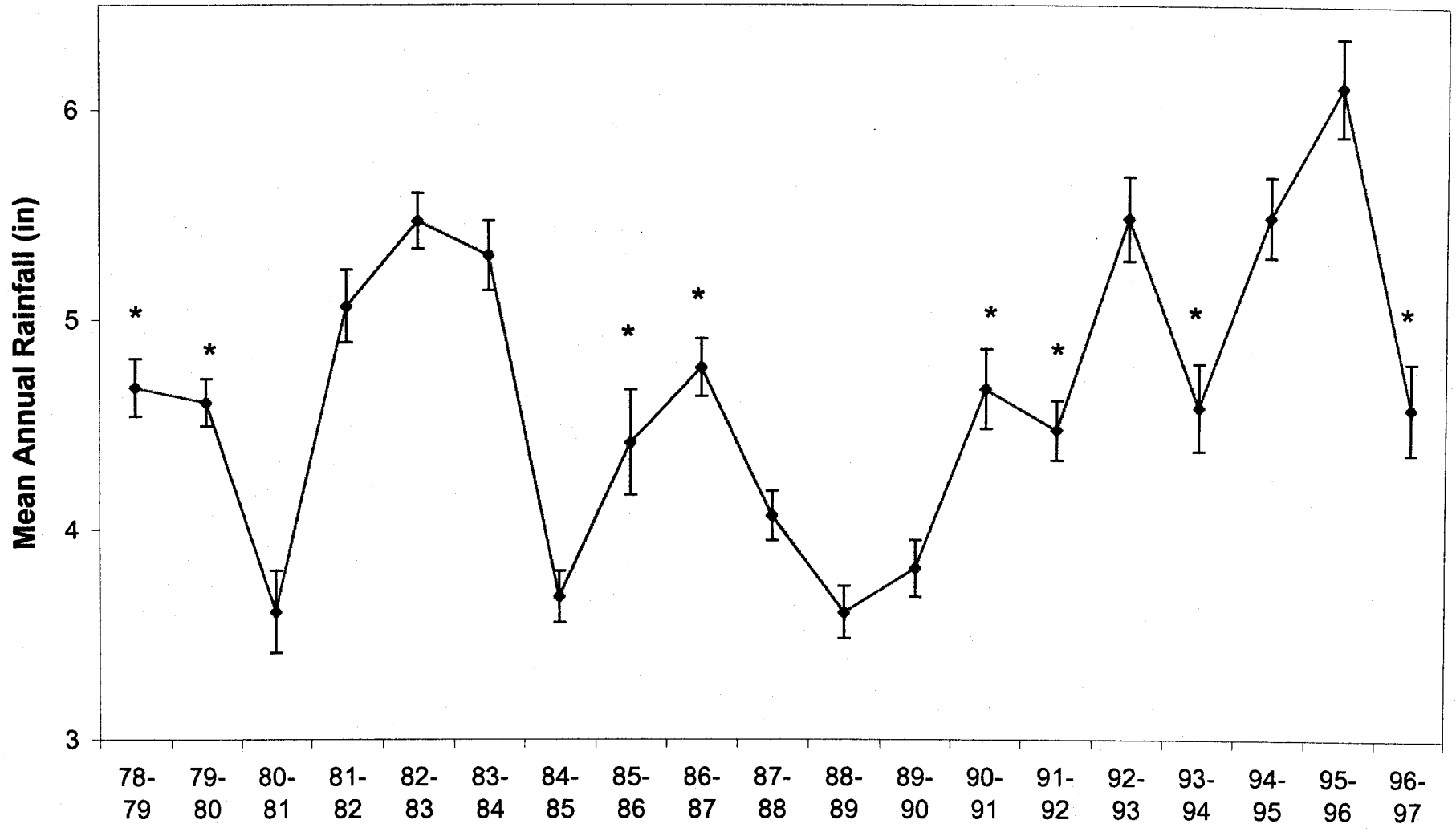
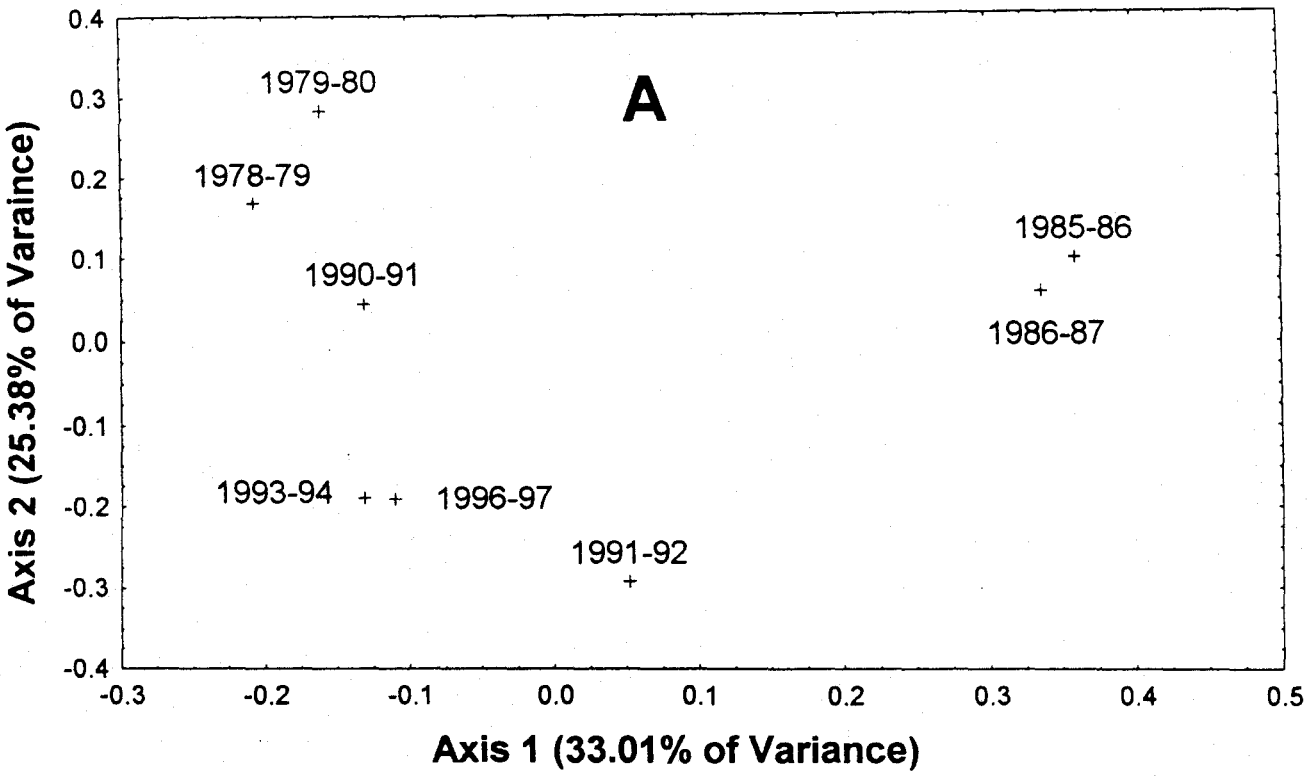


Figure E.2. Mean (±SE) annual rainfall for southern Florida based on data collections from 26 NOAA rainfall stations. Years marked with an asterisk (*) are not significantly different ($p<0.05$) from 1996-97.



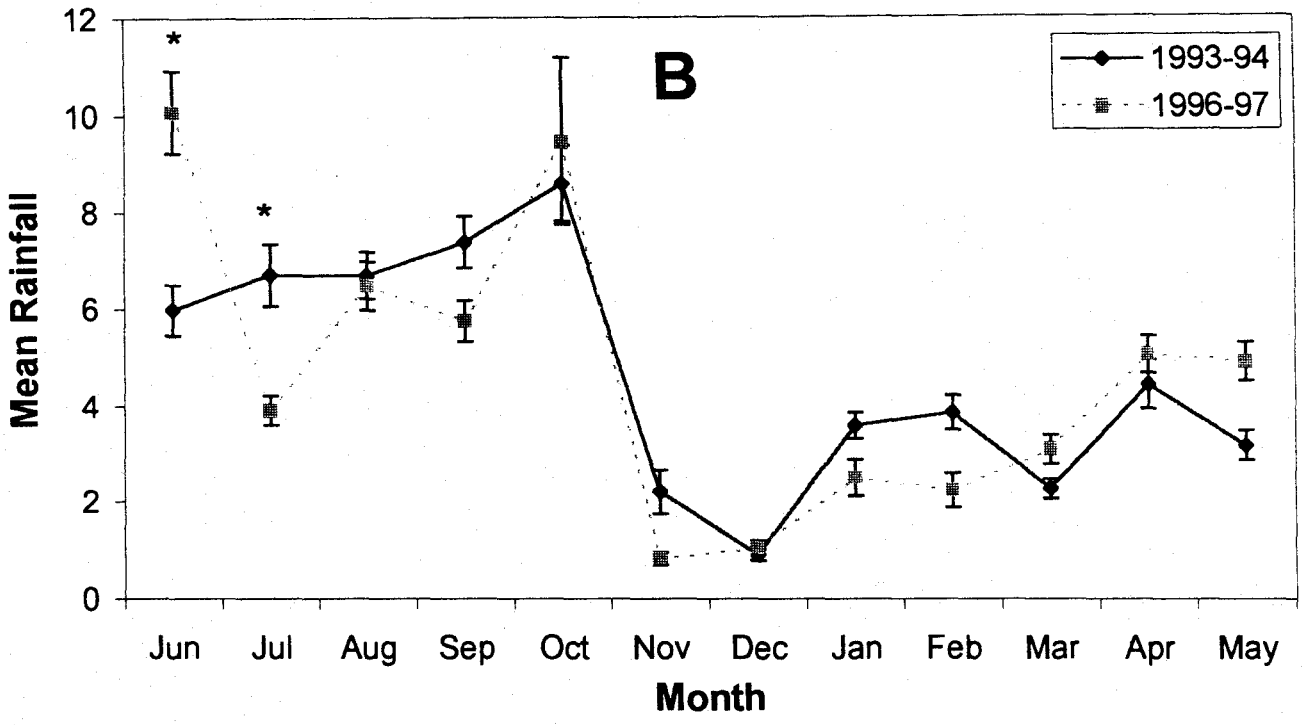


Figure E.3. Analysis of rainfall from 26 NOAA collection sites. A. Plot of ordination scores from correspondence analysis of monthly variation for 1996-97 and seven years with similar annual mean rainfall to 1996-97. B. Monthly mean rainfall (± standard error) for 1993-94 and 1996-97. An asterisk (*) indicates significant ($p<0.01$) differences between years.

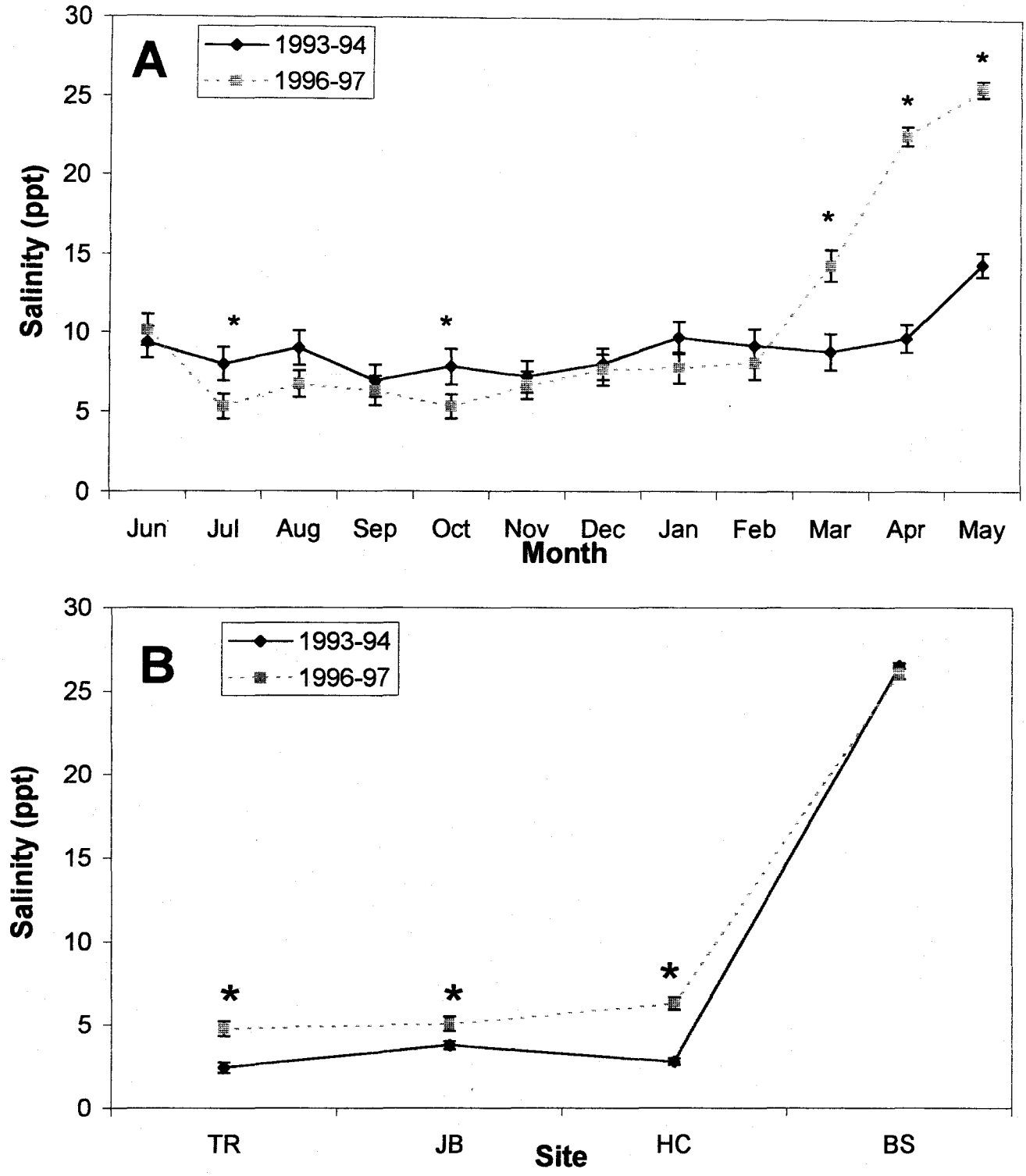


Figure E.4. Comparison of mangrove zone salinity (in parts per thousand) between 1993-94 and 1996-97 A. Mean (±SE) monthly salinity of four sites. B. Mean (±SE) annual salinity at four mangrove sites. Asterisk (*) indicates significant ($p<0.01$) differences between years.

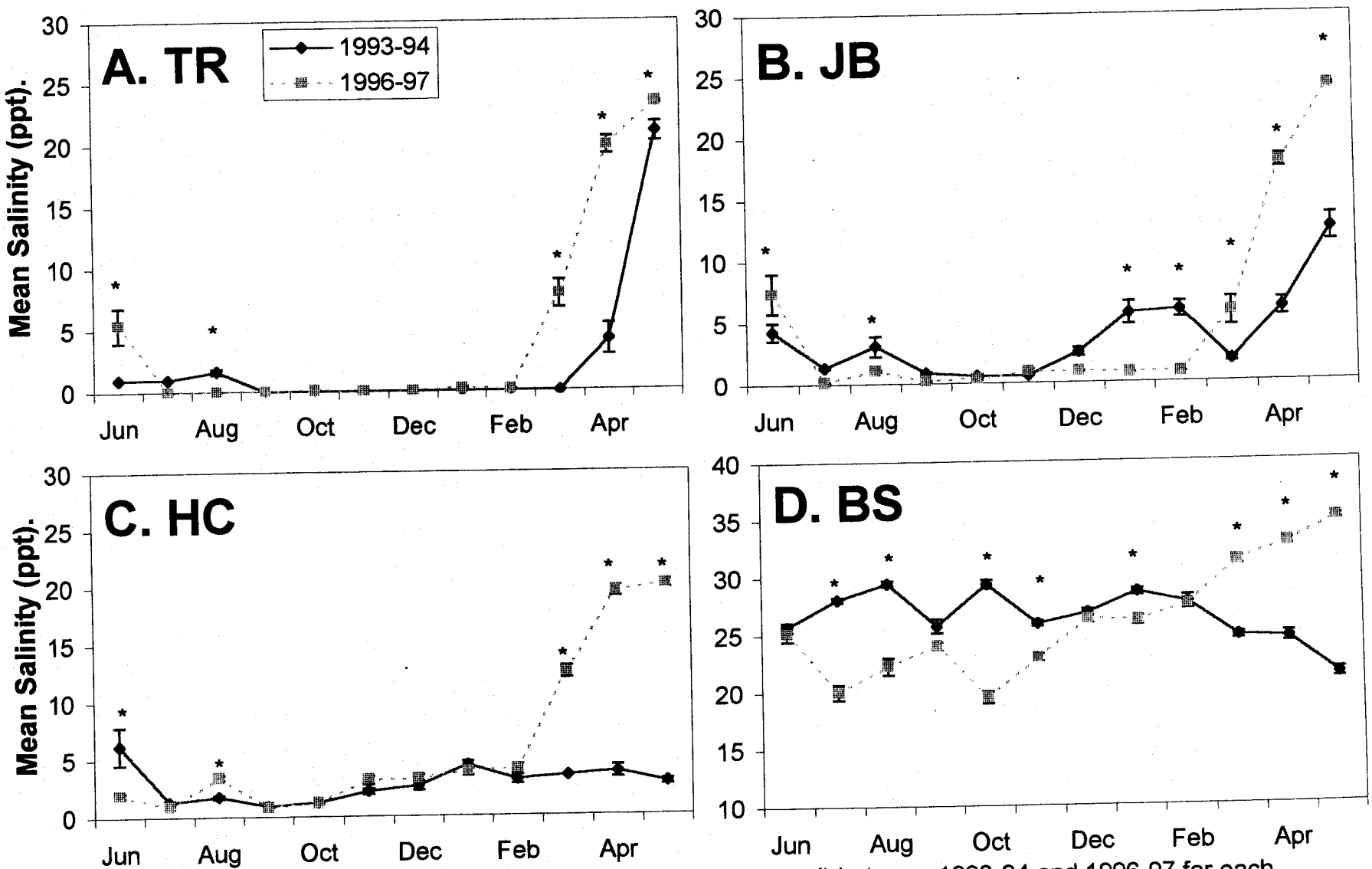


Figure E.5. Comparison of mean (±SE) monthly salinity (parts per thousand) between 1993-94 and 1996-97 for each mangrove zone collection site. An asterisk (*) indicates significant ($p<0.01$) differences between years.

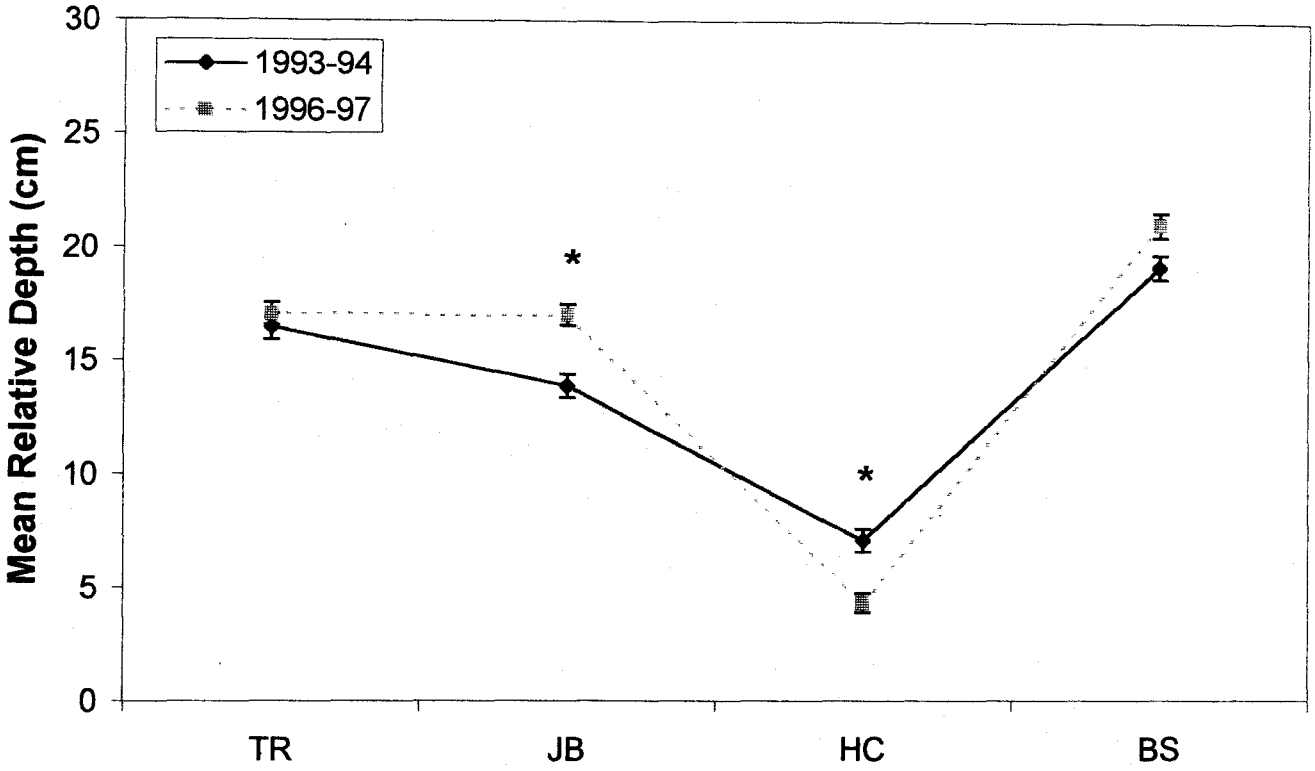


Figure E.6. Annual mean (±SE) relative depth for 1993-94 and 1994-95 at four mangrove zone collection sites. Depth is in cm of water above the level of the mangrove flats. The flats begin to dry at 5 cm and are completely dry at 0 cm. Below 0 cm the only water is located in the central creek habitat. An Asterisk (*) indicates significant ($p<0.01$) differences between years.

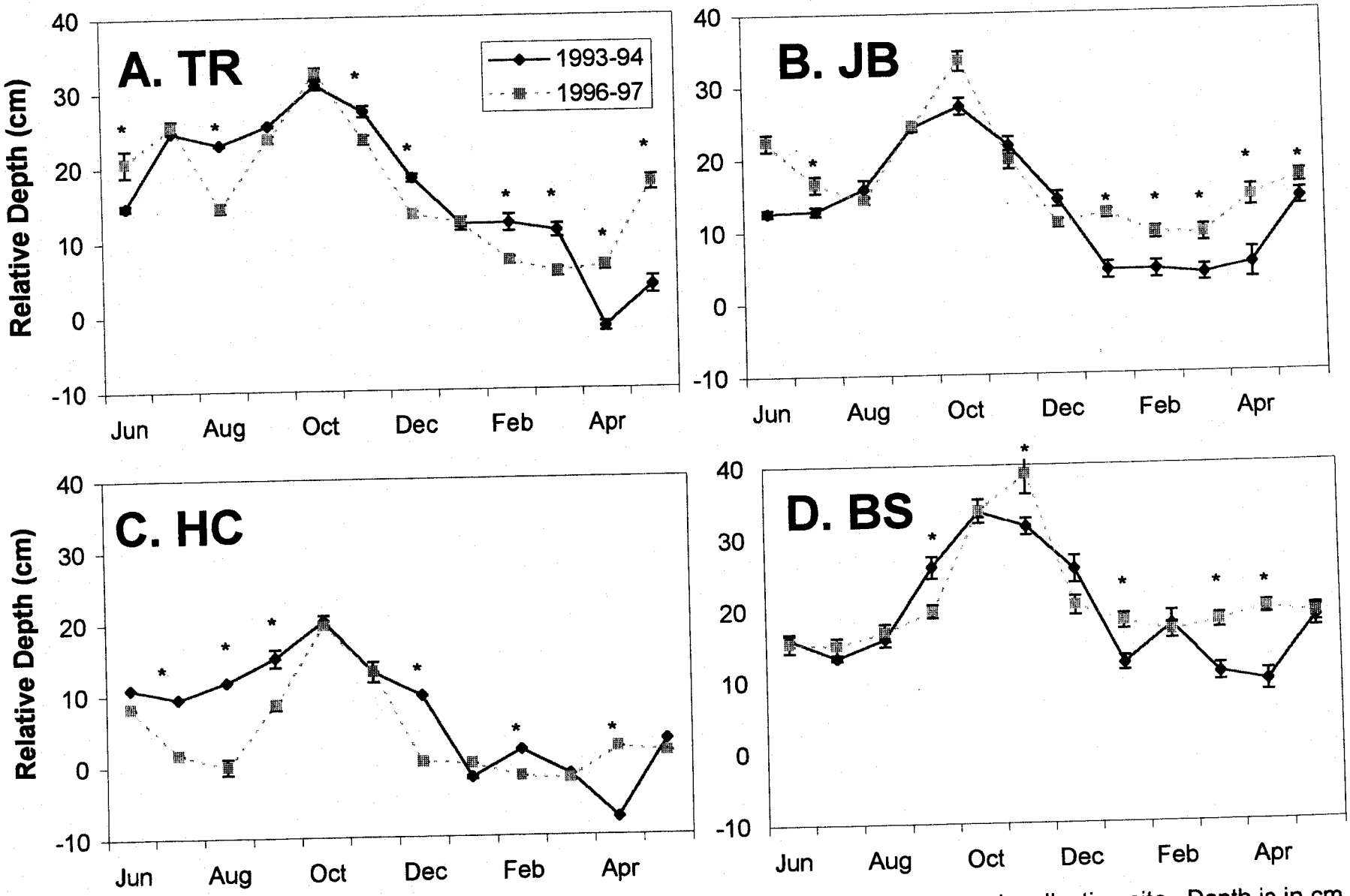


Figure E.7. Comparison of mean (±SE) relative depth between 1993-94 and 1996-97 for each collection site. Depth is in cm of water above the level of the mangrove flats. The flats begin to dry at 5 cm and are completely dry at 0 cm. Below 0 cm the only water is located in the central creek habitat. An asterisk(*) indicates significant ($p<0.01$) differences between years.

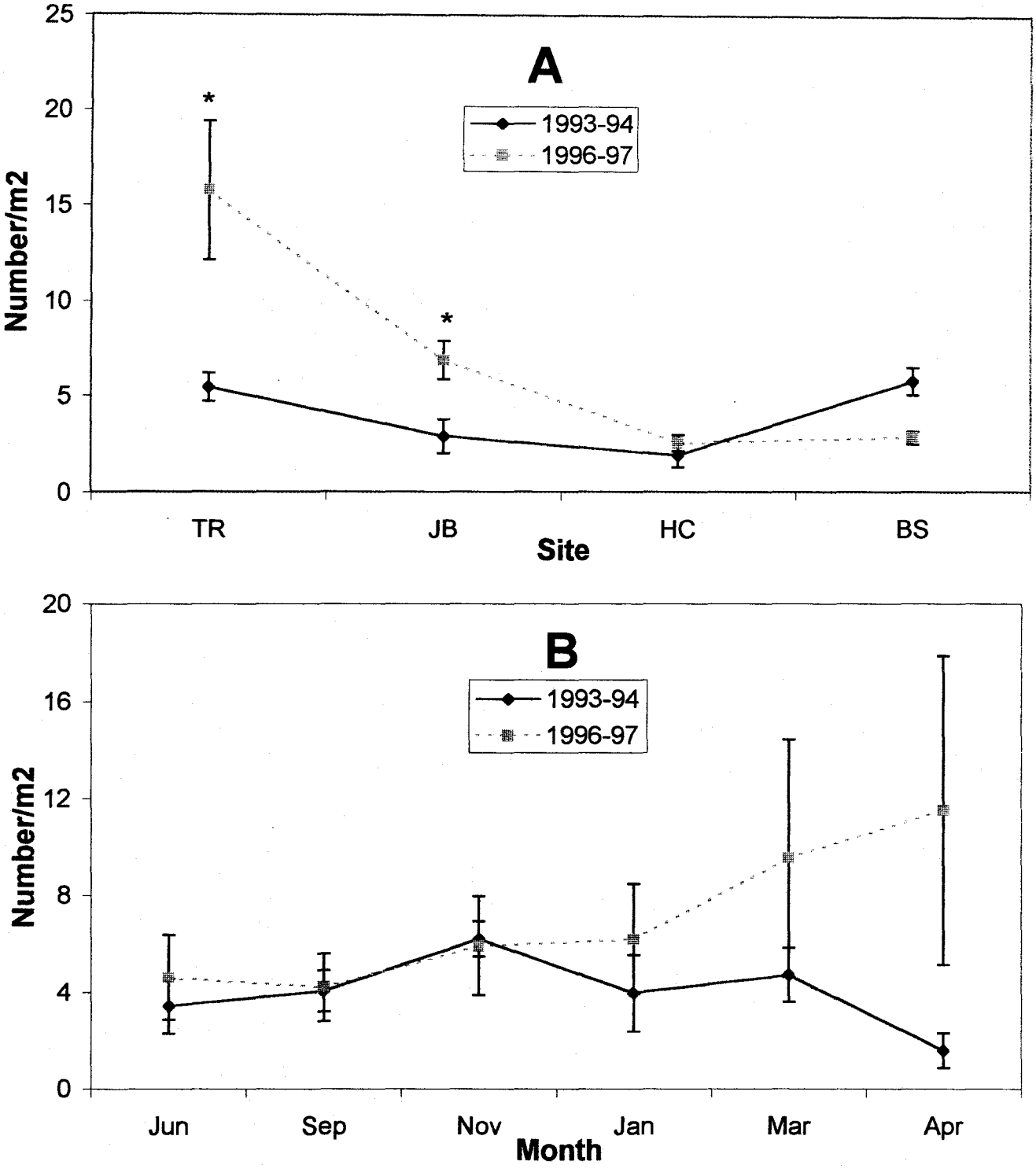


Figure E.8. Mean (±SE) stratified density per m^2 (± standard error) for the 1993-94 and 1996-97 collection years. A. Number of fish by site. B. Number of fish by month. An asterisk (*) indicates significant ($p<0.01$) differences between years.

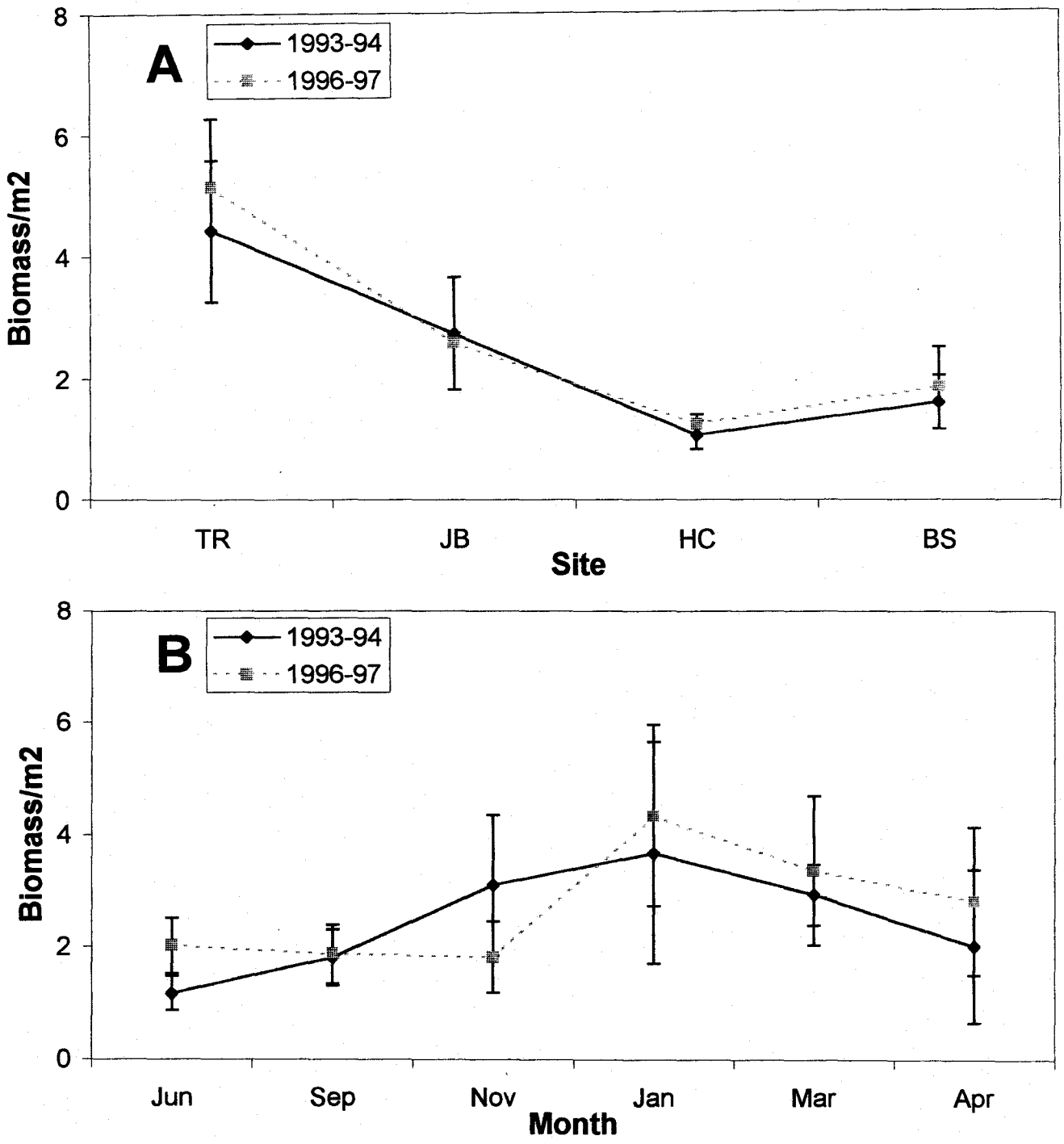


Figure E.9. Mean (±SE) stratified biomass (g) per m^2 (± standard error) for the 1993-94 and 1996-97 collection years. A. Biomass by site. B. Biomass by month. An asterisk (*) indicates significant ($p<0.01$) differences between years.

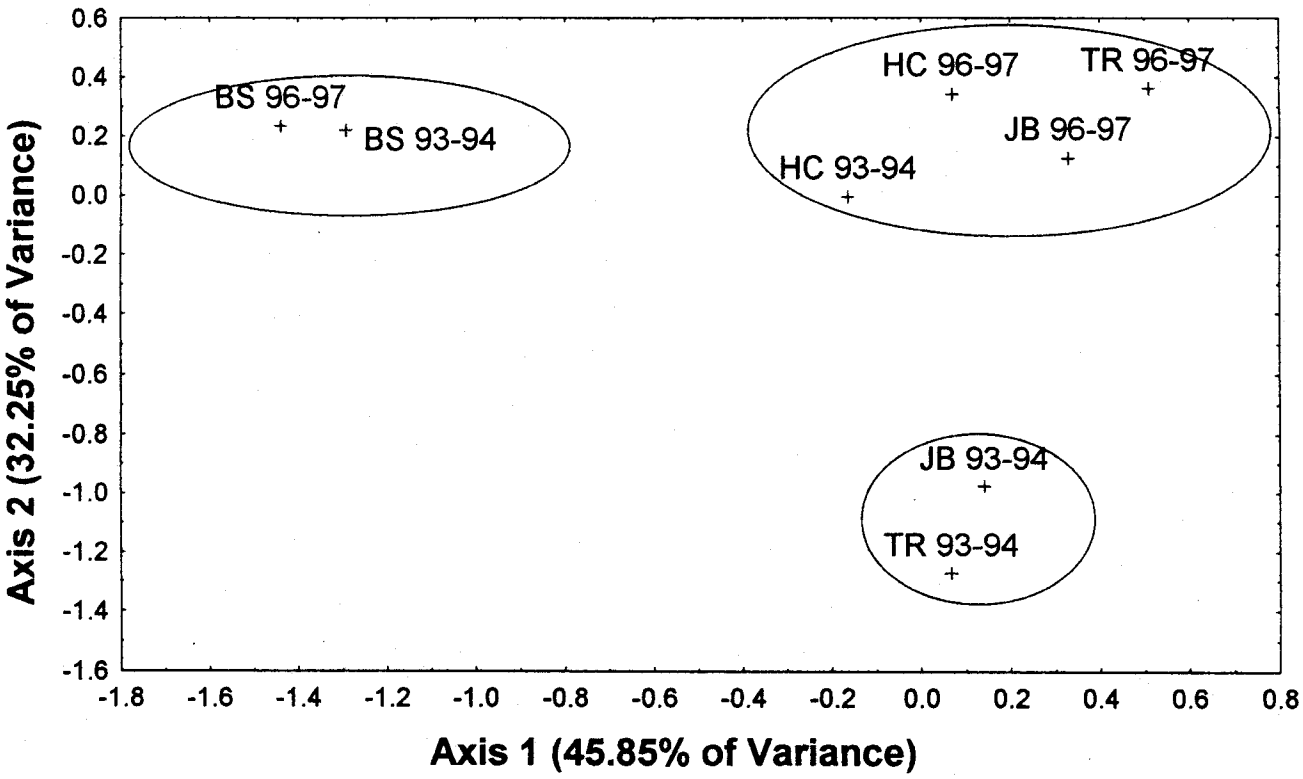


Figure E.10. Plot of ordination scores from community structure correspondence analysis.

Figure 10. Plot of ordination scores from community structure correspondence analysis.

Appendix F. Test 7 Year 3 Ecological Monitoring Results: 1997-1998. An Analysis of the Hydrology and Resident Fishes within the Coastal Mangrove Wetlands of Everglades National Park

Jerome J. Lorenz, John Paul McLendon, and Craig H. Faunce

ABSTRACT

The impact of Test 7 operations on the hydrology, hydrography and ecology of the mangrove wetlands of northeastern Florida Bay was examined for the hydrologic year 1997-98. An evaluation of 20 years of rainfall data indicated that 1994-95 was spatially, temporally and quantitatively similar to 1997-98. Test 7 was initiated after the 1995 dry season and therefore, a comparison of these two years allows for a classic before and after analysis. Analyses of water level and salinity patterns between the two years indicated very few differences between years. The differences that were apparent were attributed to temporal differences in the rainfall pattern between years and not to water management operations. There was no difference between the abundance and community structure of prey base fishes. Based on these findings, Test 7 had no impact on northeastern Florida Bay during the 1997-98 hydrologic year. This is not surprising since the substantive changes in operation were to occur during phase two of Test 7 and phase two has never been implemented. Furthermore, the operation schedule for phase one was abandoned for the entire dry season of 1997-98, to mitigate nesting problems with the federally protected Cape Sable Seaside Sparrow. Simply stated, Test 7 had no impact on northeastern Florida Bay because Test 7 was not implemented.

1. INTRODUCTION

Implementation of Test Iteration 7 of the Experimental Program of Water Deliveries to Everglades National Park (ENP) officially began October 1, 1995 (USACOE 1995). Under the auspices of the Test 7 monitoring program, the charge was to evaluate the relative impact of Test 7 on the fishes of the coastal mangrove wetland that makes up the transition zone between the fresh water environs of the Taylor Slough/C-111 basins and Florida Bay. This report evaluates the impact of Test 7 during the period of June 1997 to May 1998. Hydroperiod and salinity of mangrove sites are affected by both rainfall and water management (Appendices A and D). As with the previous year (Appendix E), the strategy used in this report to evaluate Test 7 was to

identify a year similar in rainfall pattern to the subject year (1997-98). Once a comparable rainfall year had been identified, comparisons of mangrove hydrology and aspects of the fish community were made between the years to see if the Test 7 year was different.

Statistical analysis. Critical regions for all Analyses of variance (ANOVA) were set at the traditional $p<0.05$. Multiple means separations were performed for each significant ANOVA. Unless otherwise indicated, the critical region for least squares means post hoc tests was set at $p<0.01$ thus reducing the likelihood of Type I errors (Sokal and Rohlf 1980). The post hoc test used was Tukey HSD test for unequal sample sizes (Statsoft 1995).

2. RAINFALL COMPARISONS BETWEEN YEARS

The National Oceanic and Atmospheric Administration operates rain collection gages at 26 locations across southern Florida (Table F.1) and publishes the data in annual summaries for the state. Analysis of Variance (ANOVA) was used to analyze twenty years (1978-1998) of total annual (mean of June-May) rainfall data from the 26 stations (i.e., one datum per year per location) in an effort. Results of the ANOVA indicated that there was a significant year effect ($F_{19,462}=16.50$, $p<0.01$). The results of the *post hoc* analysis (Figure F.2) indicated that five out of the 20 years were not significantly different ($p<0.05$) from 1997-98 in total rainfall across southern Florida. The results also indicate that 1997-98 was a wet year overall: there was only one year out of the last twenty that had significantly higher rainfall while 13 of the last 20 had significantly lower rainfall. The 1997-1998 El Nino Southern Oscillation event was commonly cited as the reason for the high rainfall in the subject year.

Although the total quantity of rainfall across south Florida is critical to understanding hydropatterns in the southern Everglades, the timing of rainfall is just as important when making comparisons between years. Correspondence Analysis (CA) (ter Braak 1995) was performed on mean monthly rainfall for each of the 26 locations (i.e., one datum per month per location) in an effort to analyze intra-annual rainfall patterns from the five years that ANOVA identified as having similar spatial patterns to 1997-98.

The primary and secondary axes of the CA accounted for 43.4% and 23.4% of the temporal variability in rainfall across southern Florida, respectively. In essence, the CA ordination technique condenses a distribution of data into a single point on a two dimensional graph. When plotted, points that are relatively close to each other represent distributions with similar patterns.Figure F.3a indicates that out of the five years with similar total rainfall, 1994-95 had the closest monthly rainfall distribution to 1997-98.

The results of correspondence analyses are somewhat subjective in that similarities and differences are relative to the distributions included in the analyses. Figure F.3A indicates that 1997-98 was more similar to 1994-95 than to any other of the 4 years used in the analysis, however, it does not actually indicate how similar the two years were in rainfall patterns. Direct comparisons of temporal changes can be made between the two years through a two-way ANOVA of year and month across the 26 sampling sites. The results indicate a significant interaction ($F_{11,551}=15.53$, $p<0.01$), i.e., the two years were significantly different in some aspect of the temporal rainfall pattern. The results of the least squares means *post hoc* tests (Figure F.3B) indicate that the two years were, overall, similar in temporal rainfall pattern. However, four months had significantly different ($p<0.01$) rainfall amounts between the two years. 1994-95 had more rainfall in the late wet season (October and November) while 1997-98 received more rainfall in the early wet season (June) and in the dry season (February and March).

3. WATER LEVEL AND SALINITY

Introduction. The combined results of the Analyses of Variance (Figure F.2, Figure F.3B) and the Correspondence Analysis (Figure F.3A) on the regional rainfall data indicate that 1997-98 and 1994-95 were similar in rainfall intensity on both temporal and spatial scales. This similarity potentially allows for the examination of the impacts of Test 7 through a classic before/after analysis of dependent physical and biological variables. In this case, 1994-95 represents before and 1997-98 after Test 7 initiation. Since Test 7 was designed to impact the Taylor Slough/C-111 basins but would not impact the area east of US-1, the BS site can be considered a control while TR, JB and HC are experimental sites. The main assumption of this design is that, in the absence of changes in water management practices, years with similar rainfall patterns should result

in similar salinity and water level patterns in the mangrove zone. Therefore, any observed differences in salinity and water level between 1994-95 and 1997-98 would be the result of changes in water management practices.

Theoretically, this approach is a cogent attempt at analyzing the impact of Test 7. However, the reality of the situation was that the designs set forth in Test 7 were not followed during the 1997-98 hydrologic cycle. The substantive changes to the system were to occur in phase 2 of Test 7 (USACOE 1995), which were not implemented. Furthermore, the protocol set for phase 1 was all but abandoned during 1997-98. Phase 1 called for an increase water delivery to Taylor Slough by increasing the pump capacity at S-332 to 495 cfs (USACOE 1995). This would allow water that had previously been pumped to tide via the South Dade Conveyance System (SDCS), to remain within the Everglades system. Under this plan, the amount of water exiting the system though the SDCS, specifically through S-197, would be greatly reduced. Essentially, S-197 would only be used to drain water that could not be handled by the 495 cfs pump at S332. However, dry season high water in the northern part of the system resulted in an emergency situation regarding the federally protected Cape Sable Seaside Sparrow. In December 1997 and January 1998, high water levels on sparrow nesting marshes prevented the birds from nesting. In response, water managers attempted to keep marsh water levels artificially low in nesting areas located in Northwest Shark River Slough and in the Taylor Slough headwaters area. To accomplish this goal, pumping capacity at S-332 was kept under 165 cfs from starting in January. Water upstream from ENP was diverted to the SDCS and released to tide at S-197. Test 7 was suspended from January through May 1998. Based on the analysis of rainfall patterns, the null hypothesis for this section is that 1994-95 and 1997-98 did not differ in physical parameters (i.e., salinity and water level) at any of the four sites in the coastal mangrove wetlands. Should the null hypothesis be rejected, a reasonable conclusion might be to attribute any differences in physical parameters between the two years at the experimental sites to the implementation of Test 7. However, operating conditions were essentially identical between the two years since Test 7 operational conditions were suspended during the dry season as part of the Cape Sable Seaside Sparrow emergency action. Therefore, given that 1994-95 and 1997-98 experienced similar rainfall patterns, we would expect no

significant differences in mangrove zone hydrology and hydrography between the years. Simply stated, we would expect the evidence to support the null hypothesis.

Methods. The methods for the collection of water level and salinity data are presented in the main text of this report. Water level and salinity were analyzed using a 3 way ANOVA for the effects of site, year, and month for 1994-95 and 1997-98.

Results. The ANOVA of water level revealed significant two-way interactions between month and year ($F_{11,2718}$=229.8, $p<0.01$) and between site and year ($F_{3,2718}$=24.5, $p<0.01$). The *post hoc* tests indicate that there were significant differences in water levels between the two years for all months except September (Figure F.4A). TR and HC differed significantly between the two years (Figure F.4B). A significant three way interaction between site, month and year ($F_{33,2781}$=9.85, $p<0.01$) indicated that, the pattern of water level rise and fall varied significantly between the years at all the sites (Figure F.5). 1994-95 had significantly higher water levels the late wet season and late dry season, while 1997-98 had higher water levels during the early wet and early dry seasons. This general pattern was observed at all four sites (Figure F.5). During both years, all four sites experienced atypically long hydroperiods (defined as the period of time water level was above 5 cm relative depth as this is the stage at which the swamp flats begin to go dry), presumably due to the high amount of rainfall. For example; it is typical for HC to be below 5 cm relative depth for 45 to 60 days per year (Lorenz 1997). In 1994-95 and 1997-98, HC was below 5 cm for 15 and 10 days respectively.

The ANOVA of salinity revealed significant two-way interactions between month and year ($F_{11,2771}$=68.9, $p<0.01$) and between site and year ($F_{3,2771}$=13.6, $p<0.01$). Means separations of the month and year interaction (Figure F.6A) indicated that salinity was significantly different between the two years for only 3 months (July, August and April). Salinity was higher in 1994-95 during the early wet season and late dry season. A significant 3-way interaction between site, month and year ($F_{33,2771}$=7.8, $p<0.01$) indicated that this general pattern (higher salinity during the early wet season and late dry season of 1994-95) was repeated at all four sites (Figure F.7). The *post hoc* tests for the site and year interaction indicated that mean salinity was higher during 1994-95 at TR, JB and BS (Figure F.6B). TR, JB and HC had a longer period of fresh water (<5ppt) during 1997-98 than in 1994-95 (Figure F.7).

Discussion. Water levels in the mangrove wetlands were significantly higher in 1997-98 during the early wet and middle dry season (Figure F.4A). However, the highest water levels occurred in 1994-95 between September and December (Figure F.4A). Similar patterns in water level fluctuation were repeated at all four sites (Figure F.5). If the differences between years were caused by water management practices we would expect to see differences between years at the sites that would be impacted by Test 7 (TR, JB and HC) but not at the control site (BS). That this pattern occurred at BS indicates that the differences in water level are not a result of Test 7.

The observed pattern of water level fluctuations in the mangrove zone (Figure F.4A) was very similar to the temporal rainfall pattern for the two years (Figure F.3). For example, there was significantly more rainfall in October and November during 1994-95 than in 1997-98 which coincides with higher water levels for 1994-95. Likewise, 1997-98 had significantly higher rainfall in June and February coinciding with significantly higher water levels than in 1994-95. It appears that water level throughout the mangrove zone was a function of rainfall for both years. That BS followed the same pattern as the other three sites indicates that Test 7 did not mitigate the distribution of Everglades runoff to the mangrove estuaries.

Salinity patterns also appeared to be related to rainfall but with an approximate one month lag. Both years had similar salinity in June (Figure F.6A), however extremely heavy rain in June 1997 resulted in very low salinities in July. In 1994-95 rainfall increased gradually through the early wet season and salt water was not forced out of the mangroves until September (Figure F.6A). In a typical year salinity usually begins to increase in February when a lack of rainfall over the Everglades lowers the freshwater head. 1994-95 followed this pattern but in 1997-98, significant rainfall in February and March kept mangrove salinities lower in March and April (Figure F.6A). Like water level patterns, the general pattern in salinity was repeated at all four sites including BS (Figure F.7) indicating water management had little to do with the differences observed between years.

Independent of Test 7, water managers had the southern berm of the C-111 canal degraded in 1997 in an effort to better distribute effluent from the canal to the panhandle region of ENP and the mangrove zone. Prior to deconstruction, the eastern most gaps

were at a lower elevation causing most water to exist the canal near US-1. As a result, the HC site received large pulses of freshwater whenever releases were made S-18C. When the berm was degraded in 1997, the eastern end was left at a foot higher than the western end with the belief that this would result in flow exiting the canal across a wider area. Site differences between water level and salinity in the two years may indicate that this effort was successful. Water levels were higher at TR and JB while water level was significantly lower at HC in 1997-98 compared to 1994-95 (Figure F.4). Likewise salinity was significantly higher at JB and TR than at HC in 1994-95 but in 1997-98 all three sites had about the same salinity (Figure F.6). This may possibly indicate that water exiting the canal has be reapportioned, with the eastern site receiving less and the western sites more than what was delivered in 1994-95.

4. IMPACT ON MANGROVE FISHES

Introduction. Although analyses of the impact of Test 7 on water level and salinity indicated that Test 7 had little impact on the mangrove environment, an examination of the fish community could help validate these findings. Previous analyses indicated that fish abundance and community structure are linked to salinity and water level (Appendix D). Based on this finding, the null hypothesis tested in this section is that the coastal mangrove wetlands the fish community (fish abundance and community structure) did not differ between 1994-95 and 1997-98 at any of the four sites. Should the null hypotheses be rejected, a reasonable conclusion might be to attribute any differences in these biological parameters between the two years at the experimental sites to the implementation of Test 7. However, based on the findings for water level and salinity, we expect to accept the null hypothesis.

Methods. The methods for the collection of fish samples are summarized in the main text of this report and presented in detail in Appendix A. As described in the main text of this report, standardized numerical manipulations were performed on the data in preparation for statistical analyses. Estimates of density and biomass per square meter of wetland for each of the two years were examined with ANOVA and CA.

Results. A thorough presentation of each sample collection is presented in Appendices B and C. The percent of catch by site for all species collected is presented

for 1994-95 in Table 2 and for 1997-98 in Table 3. Total percent for all sites combined, total number of species and individuals collected, and total sampling effort are also provided in these tables. Rainwater killifish (Lucania parva) showed the largest increase while crested gobys (Lophogobius cyprinoides) showed the greatest decrease in percent catch from 1994-95 to 1997-98. Other than these two species, the differences in percent catch by species were negligible between years. The number of fish collected per unit effort (non-stratified mean number of fish per net) was about the same (38.5 in 1994-95 and 37.3 in 1997-98) as were the number of species collected (30 and 31 respectively).

Analysis of variance indicated no significant difference in density of fish ($F_{1,38}$=3.9, p>0.05) between years. 1994-95 averaged 4.2 fish per m^2 (SE=0.61) and 1997-98 averaged 2.9 fish per m^2 (SE=0.36). There was no significant interaction between site and year ($F_{3,32}$=0.8, p>0.05), however a means separation indicated that TR had significantly higher average fish density in 1994-95 (Figure F.8A). There was a significant interaction between years and months ($F_{4,30}$=4.0, p>0.05) however a plot of the means indicates that the months were very similar with only April having a significant difference (Figure F.8B).

Analysis of variance indicated no significant difference in biomass per m^2 ($F_{1,38}$=0.6, p>0.05) between years. 1994-95 averaged 2.4g of fish per m^2 (SE=0.5) and 1997-98 averaged 2.9g of fish per m^2 (SE=0.44). There was no significant interaction between site and year ($F_{3,32}$=0.6, p>0.05), and the means separation indicated that the sites were nearly identical across the two years (Figure F.9A). There was no interaction between years and months ($F_{4,30}$=1.1, p>0.05) and a plot of the means indicates that the months were very similar (Figure F.9B).

The primary and secondary axis of the CA explained for 56% and 35% of the variability in community structure between sites and years (Figure F.10). The ordination scores fall into four groups as indicated in Figure F.10 with the sites falling out together into groups. Although more pronounced at BS than the other sites, the CA indicates there was little difference in community structure at any of the sites between years.

Discussion. The density and biomass of prey base fishes between the two years is strikingly similar. The only notable differences were that density was higher at TR in 1994-95 and that April 1995 had significantly higher density than April 1998. These two

differences are probably related. Starting in late March 1998, water levels at TR began to drop below the critical 5 cm relative depth mark. At this point, the flats begin to dry and fish are concentrated into the remaining wetted area. When this happens mortality increases due to strandings and increased likelihood of being preyed upon (Lorenz 1997). In 1994-95 water levels at TR remained well above 5 cm relative depth for the entire dry season and no such mortality events occurred. Furthermore, the continued wet period allowed fish density to continue increasing thereby accounting for higher biomass at TR and in April during 1994-95. Water level did drop below 5 cm relative depth at the other three sites. Other than this, prey base fish abundance was virtually the same between the two years.

Community structure in the prey base community is principally determined by, and is highly sensitive, to hydrography and hydrology (Appendix D). That the community structure was almost identical between the two years within individual sites (Figure F.10, Table F.2 and 3) is a strong indicator that physical conditions were very similar at the sites between the two years. The water level and salinity presented support this conclusion.

5. SYNTHESIS, CONCLUSIONS, AND SUMMARY

The combined results of the temporal and spatial analyses of annual rainfall patterns strongly indicated that 1994-95 was very similar to the subject year (1997-98). Comparisons of mangrove characteristics between the two years was used to evaluate Test 7. Hydrology and fish abundance were evaluated and very few significant differences found between the two years.

Previously, mangrove fish density was demonstrated to be partially determined by length of hydroperiod (Appendix D). Comparisons of density and water level between the two years support this finding. As implied in the previous paragraph, there were very few differences in fish density and those that were observed were likely caused by temporal differences in rainfall patterns rather than water management.

Analysis of hydrographic conditions indicated that 1997-98 1994-95 were very similar as well. Higher than average rainfall throughout both years resulted in lower than average salinity at all the sites. For the most part, the Florida Bay sites experienced near

freshwater conditions for almost the entirety of both years. Although lower salinity in the mangrove zone during the dry season was a goal of Test 7, it is unlikely that water management had anything to do with the low salinities. Rather, the observed results can only be attributed to the high amount of rainfall.

Biomass production in mangrove fishes has been shown to be related to long term salinity patterns. The observation that fish biomass remained unchanged between the two years was, therefore, not surprising. More to the point, the two years were remarkably similar in biomass production.

Fish community structure is highly sensitive to changes in the physical environment. That the communities did not vary between the two years within the sites is the strongest indicator that there were little physical differences in mangrove zone water column between the two years. The results from the analyses of community structure and fish density were very similar to what might have been predicted from previous findings and indicate that this monitoring program has a high degree of sensitivity to hydrology and the resultant biotic changes.

This report attempted to evaluate the impact of Test 7 on the mangrove ecosystem. Although Test 7 was expected to increase fresh water flow to the mangrove zone and, thereby, impact the biota of the region, the operational changes were never fully implemented. Those changes that were initiated were abandoned during the dry season. The conclusion reached is that there were no differences in any of the measured parameters as a result of water management practices. The implication is not that Test 7 is a failure, rather that the implementation of Test 7 has failed. It may seem ridiculous to state, but Test 7 can not be evaluated until it is implemented.

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Table F.1. NOAA rainfall gage locations

Everglades Division	**Lower East Coast Division**
Belle Glade	Coral Springs
Canal Point	Ft Lauderdale
Clewiston	Hialeah
Devils Garden	Homestead
Everglades	Loxahatchee
Flamingo	Miami Beach
Fort Myers	Miami Airport
Immokalee	Perrine
La Belle	Pompano Beach
Moore Haven	Royal Palm
Naples	Stuart
Oasis	West Palm Beach
Punta Gorda	
Tamiami	

Table F.2. Phylogenetic list of all species collected at all four sites in 1994-95 and the percent of catch at each site. Species used in the community analysis (CA) are marked with an asterisk (*).

ORDER Family Genus species	Common Name	TR	JB	HC	BS	Total
SILURIFORMES						
Ichtaluridae	Freshwater catfish					
Ameiurus natalis	Yellow Bullhead					0
Noturus gyrinus	Tadpole Madtom			0.10		0.02
Clariidae	Labyrinth catfishes					
Clarias batrachus	Walking Catfish		0.11			0.02
BATRACHOIDIFORMES						
Batrachoididae	Toadfishes					
Opsanus beta (juv)	Gulf Toadfish				0.21	0.05
ATHERINIFORMES						
Atherinidae	Silversides					
Menidia sp	Silverside	2.12	12.46	0.31	2.63	4.01
Belonidae	Needlefishes					
Strongylura notata (juv)	Redfin Needlefish				0.95	0.21
Cyprinodontidae	Killifishes					
Adinia xenica	Diamond Killifish			2.08		0.46
Cyprinodon variegatus*	Sheepshead Minnow	2.77	28.71	56.77	15.25	22.75
Floridichthys carpio*	Goldspotted Killifish		0.65		33.86	7.48
Fundulus chrysotus	Golden Topminnow	0.06				0.02
F. confluentus*	Marsh Killifish	0.13	2.28	2.71	0.11	1.14
F. grandis<6.5cm	Gulf Killifish		0.33			0.07
F. grandis>6.5cm	Gulf Killifish		0.22	0.10		0.07
F. Seminolus	Seminole Killifish					0
F. similis<6.5cm	Longnose Killifish					0
F. similis>6.5cm	Longnose Killifish					0
Heterandria formosa	Least Killifish					0
Jordinella floridae	Florida Flagfish		0.05	0.35		0.10
Lucania goodei	Bluefinned Killifish	8.37	3.36	4.27		4.60
Lucania Parva*	Rainwater Killifish	14.10	11.81	8.02	18.19	13.18
Poeciliidae	Livebearers					
Belonesox belizanus	Pike Killifish	0.71	0.54			0.36
Gambusia holbrooki*	Mosquitofish	0.39	2.38	9.27	0.74	2.83
Poecilia latipinna*	Sailfin Molly	2.96	10.73	6.88	3.26	5.52
CYPRINIFORMES						
Cyprinidae	Minnows					
Notropis sp	Shiner	0.26				0.09
GASTEROFORMES						
Syngnathidae	Pipefishes					
Syngnathus louisianae	Chain Pipefish				0.11	0.02
PERCIFORMES						
Gerreidae<6.5cm	Mojarras		0.11		3.15	0.71
Gerreidae>6.5cm	Mojarras		0.11		1.16	0.27

Table 2 (Cont)

		TR	JB	HC	BS	Total
Gobiidae	Gobies					
Gobiosoma bosc	Naked Goby	1.42	0.22			0.55
Lophogobius cyprinoides	Crested Goby	29.62	0.11			10.51
Microgobius gulosus*	Clown Goby	3.93	1.19	0.31	20.40	6.13
Centrarchidae	Sunfish spp.		0.43	0.10		0.11
Elassoma evergladi	Pygmy Sunfish	0.26				0.09
Lepomis gulosus	Warmouth					0
L. marginatus	Dollar Sunfish	0.13		0.10		0.07
L. punctatus	Spotted Sunfish		0.65			0.14
L. macrochirus	Bluegill	0.06				0.02
Micropterus salmoides	Largemouth Bass					0
Cichlidae	Cichlids					
Cichlasoma bimaculatum	Black Acara					0
C. urophthalmus<6.5cm*	Mayan Cichlid	10.05	16.79	7.92		8.82
C. urophthalmus>6.5cm	Mayan Cichlid	3.35	5.85	0.63		2.55
Tilapia mariae	Spotted Tilapia	19.32	0.87	0.31		7.09
PLEURONECTIFORMES						
Soledae	Soles					
Trinectes maculatus	Hogchoker			0.10		0.02
TOTAL FISH COLLECTED		1553	923	960	951	4387
NUMBER OF SPECIES		18	20	17	12	31
NUMBER OF NETS SAMPLED		29	29	26	30	114
NUMBER OF DATES SAMPLED		5	5	5	5	20

Table F.3. Phylogenetic list of all species collected at all four sites in 1997-98 and the percent of catch at each site. Species used in the community analysis (CA) are marked with an asterisk (*).

ORDER Family Genus species	Common Name	TR	JB	HC	BS	Total
SILURIFORMES						
Ichtaluridae	Freshwater catfish					
Ameiurus natalis	Yellow Bullhead					0
Noturus gyrinus	Tadpole Madtom					0
Clariidae	Labyrinth catfishes					
Clarias batrachus	Walking Catfish					0
BATRACHOIDIFORMES						
Batrachoididae	Toadfishes					
Opsanus beta (juv)	Gulf Toadfish				0.35	0.08
ATHERINIFORMES						
Atherinidae	Silversides					
Menidia sp	Silverside	0.88	0.18		2.34	0.75
Belonidae	Needlefishes					
Strongylura notata (juv)	Redfin Needlefish				1.35	0.29
Cyprinodontidae	Killifishes					
Adinia xenica	Diamond Killifish		0.09	3.10	0.07	0.75
Cyprinodon variegatus*	Sheepshead Minnow	4.47	41.41	47.14	21.49	30.67
Floridichthys carpio*	Goldspotted Killifish	0.07		0.20	17.38	3.82
Fundulus chrysotus	Golden Topminnow		0.04	0.20		0.06
F. confluentus*	Marsh Killifish	0.44	1.15	9.16	0.07	2.59
F. grandis<6.5cm	Gulf Killifish		0.09	3.97	1.70	1.30
F. grandis>6.5cm	Gulf Killifish	0.07		0.67	0.43	0.26
F. Seminolus	Seminole Killifish					0
F. similis<6.5cm	Longnose Killifish				0.14	0.03
F. similis>6.5cm	Longnose Killifish				0.43	0.09
Heterandria formosa	Least Killifish		0.04			0.02
Jordinella floridae	Florida Flagfish	0.15		0.07		0.05
Lucania goodei	Bluefinned Killifish	0.29	1.46	0.13		0.60
Lucania Parva*	Rainwater Killifish	36.14	30.60	8.48	37.73	28.26
Poeciliidae	Livebearers					
Belonesox belizanus	Pike Killifish	0.81	0.49	0.54	0.07	0.48
Gambusia holbrooki*	Mosquitofish	4.11	2.48	7.14	1.21	3.61
Poecilia latipinna*	Sailfin Molly	9.90	9.96	11.52	2.98	8.79
CYPRINIFORMES						
Cyprinidae	Minnows					
Notropis sp	Shiner					0
GASTEROFORMES						
Syngnathidae	Pipefishes					
Syngnathus louisianae	Chain Pipefish				0.07	0.02
PERCIFORMES						
Gerreidae<6.5cm	Mojarras		0.04		2.41	0.54
Gerreidae>6.5cm	Mojarras				0.07	0.02

Table F.3 (Cont)

		TR	JB	HC	BS	Total
Gobiidae	Gobies					
Gobiosoma bosc	Naked Goby	0.07				0.02
Lophogobius cyprinoides	Crested Goby	4.18				0.87
Microgobius gulosus*	Clown Goby	10.56	0.40	0.07	8.87	4.28
Centrarchidae	Sunfish spp.	0.07	0.04			0.04
Elassoma evergladi	Pygmy Sunfish					0
Lepomis gulosus	Warmouth					0
L. marginatus	Dollar Sunfish	0.07				0.02
L. punctatus	Spotted Sunfish	3.15	2.13	0.27		1.46
L. macrochirus	Bluegill					0
Micropterus salmoides	Largemouth Bass	0.15				0.03
Cichlidae	Cichlids					
Cichlasoma bimaculatum	Black Acara					0
C. urophthalmus<6.5cm*	Mayan Cichlid	21.85	8.64	7.21	0.78	9.38
C. urophthalmus>6.5cm	Mayan Cichlid	0.95	0.62	0.07		0.43
Tilapia mariae	Spotted Tilapia	0.81	0.04	0.07		0.20
PLEURONECTIFORMES						
Soledae	Soles					
Trinectes maculatus	Hogchoker					0
TOTAL FISH COLLECTED		1364	2258	1485	1410	6517
NUMBER OF SPECIES		20	18	16	17	30
NUMBER OF NETS SAMPLED		45	46	43	41	175
NUMBER OF DATES SAMPLED		8	8	8	8	32

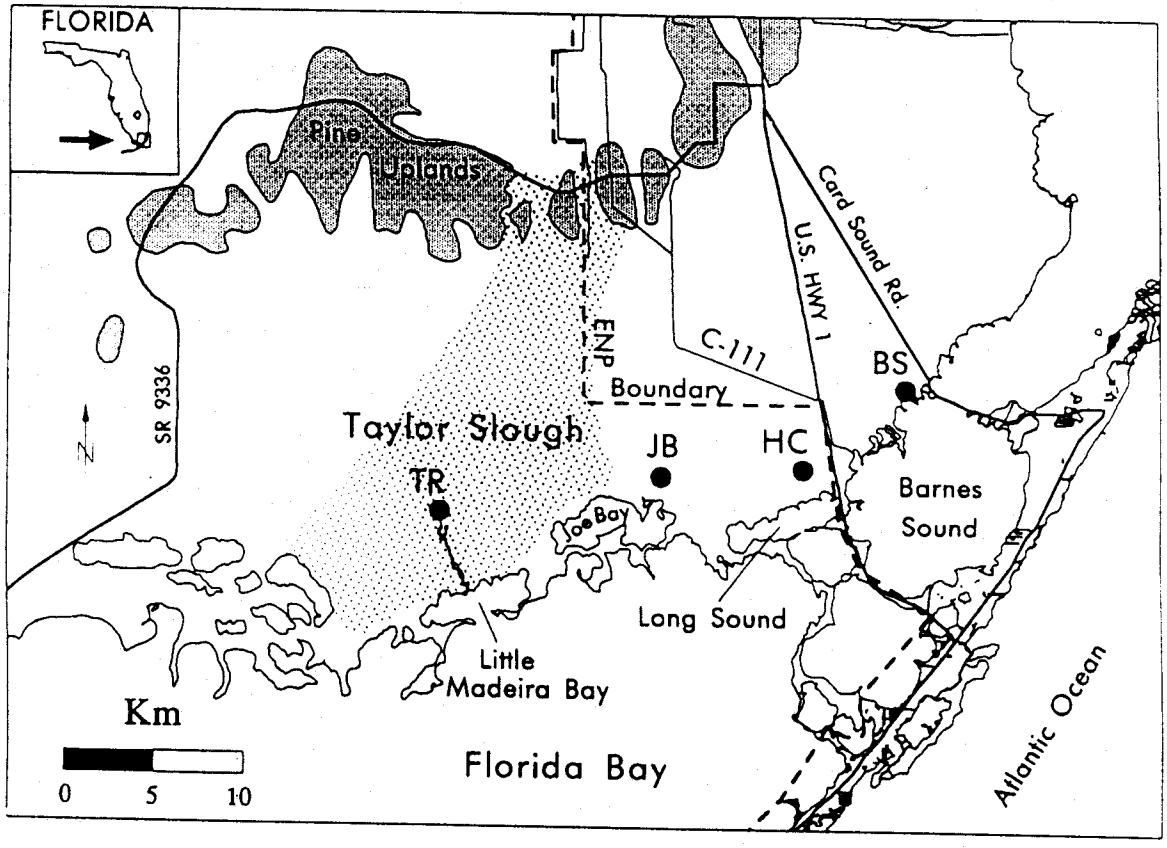


Figure F.1. Map of southern Florida indicating the four mangrove zone collection sites, Taylor Slough, C-111 canal, U.S. Highway 1, and Card Sound Road.

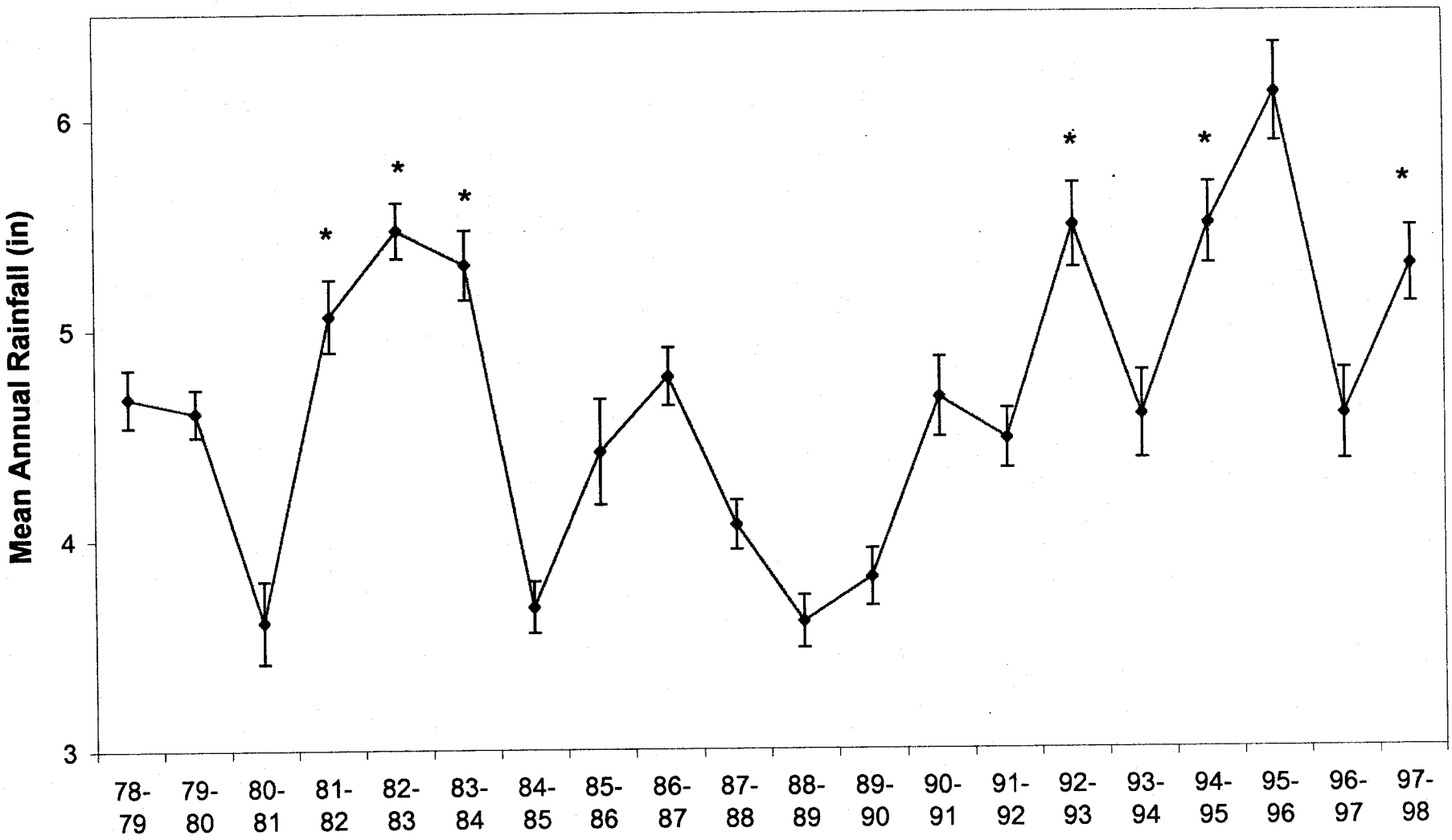


Figure F.2. Mean (±SE) annual rainfall for southern Florida based on data collections from 26 NOAA rainfall stations. Years marked with an asterisk (*) are not significantly different ($p<0.05$) from 1997-98.

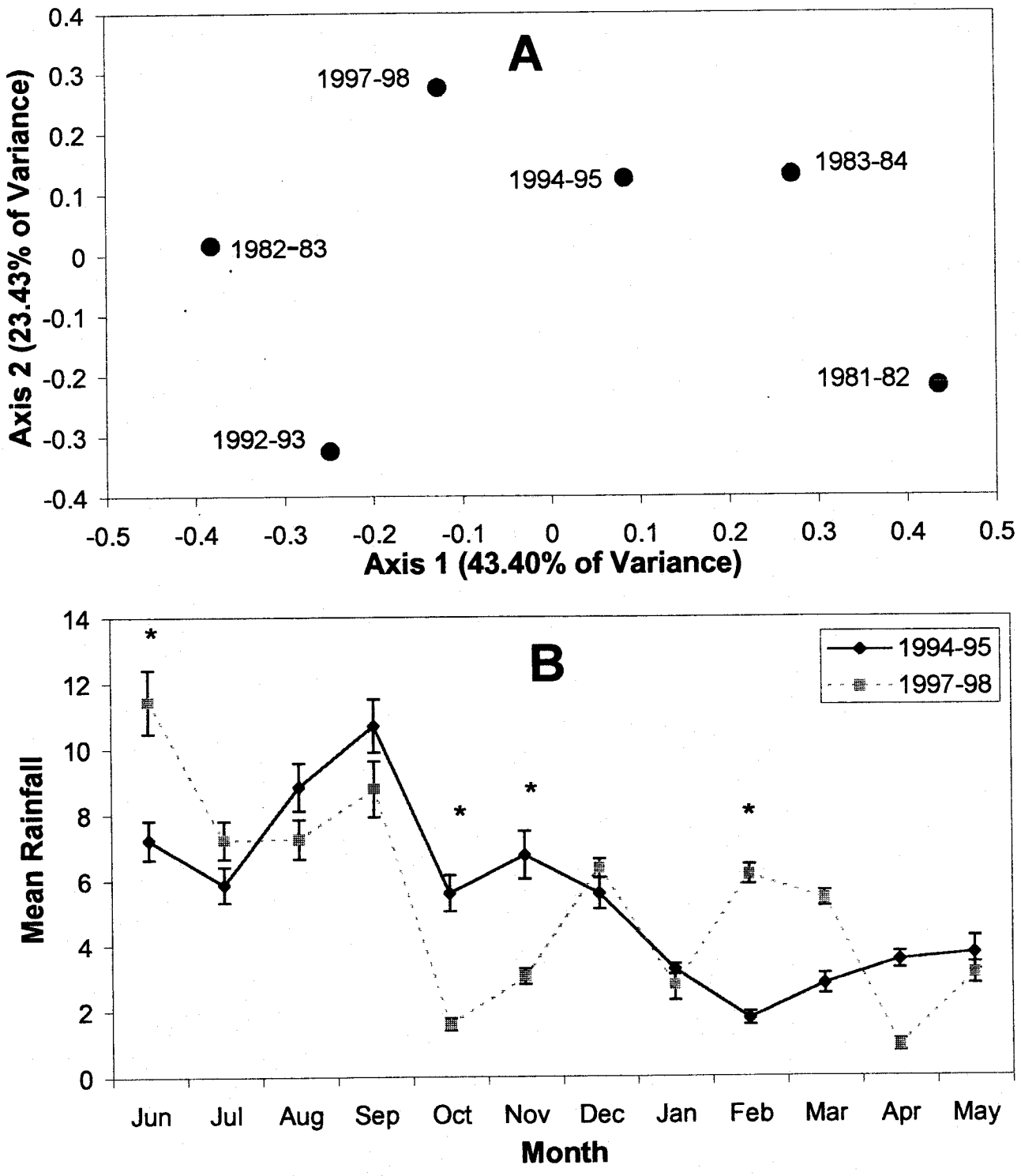


Figure F.3. Analysis of rainfall from 26 NOAA collection sites. A. Plot of ordination scores from correspondence analysis of monthly spatial variation for 1997-98 and five years with similar annual mean rainfall to 1997-98. B. Monthly mean rainfall (± standard error) for 1994-95 and 1997-98. An asterisk (*) indicates significant ($p<0.01$) differences between years.

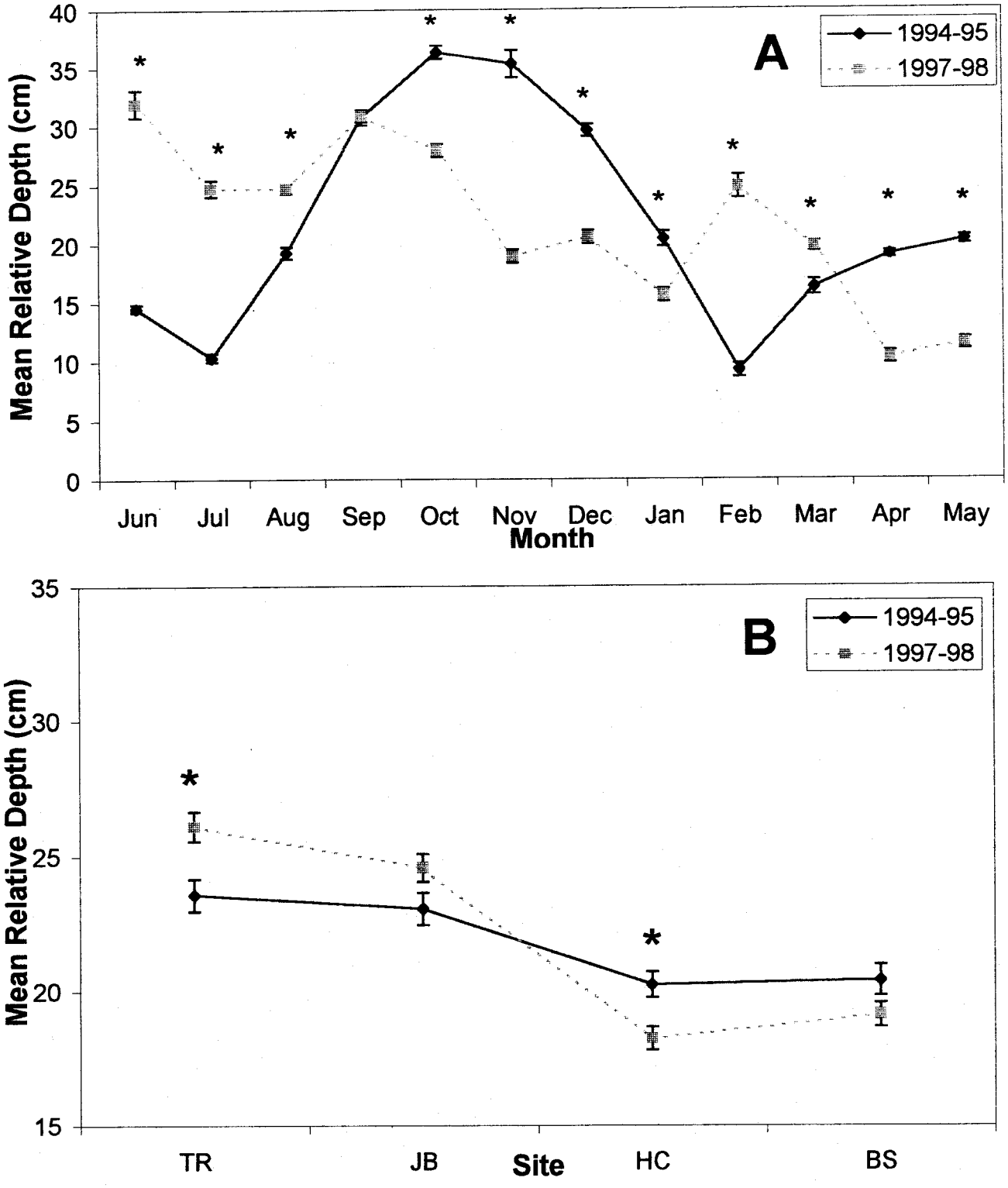


Figure F.4. Comparison of mangrove zone mean relative depth (cm) between 1994-95 and 1997-98 A. Mean (±SE) monthly depth of four sites. B. Mean (±SE) annual depth at four mangrove sites. Asterisk (*) indicates significant ($p<0.01$) differences between years.

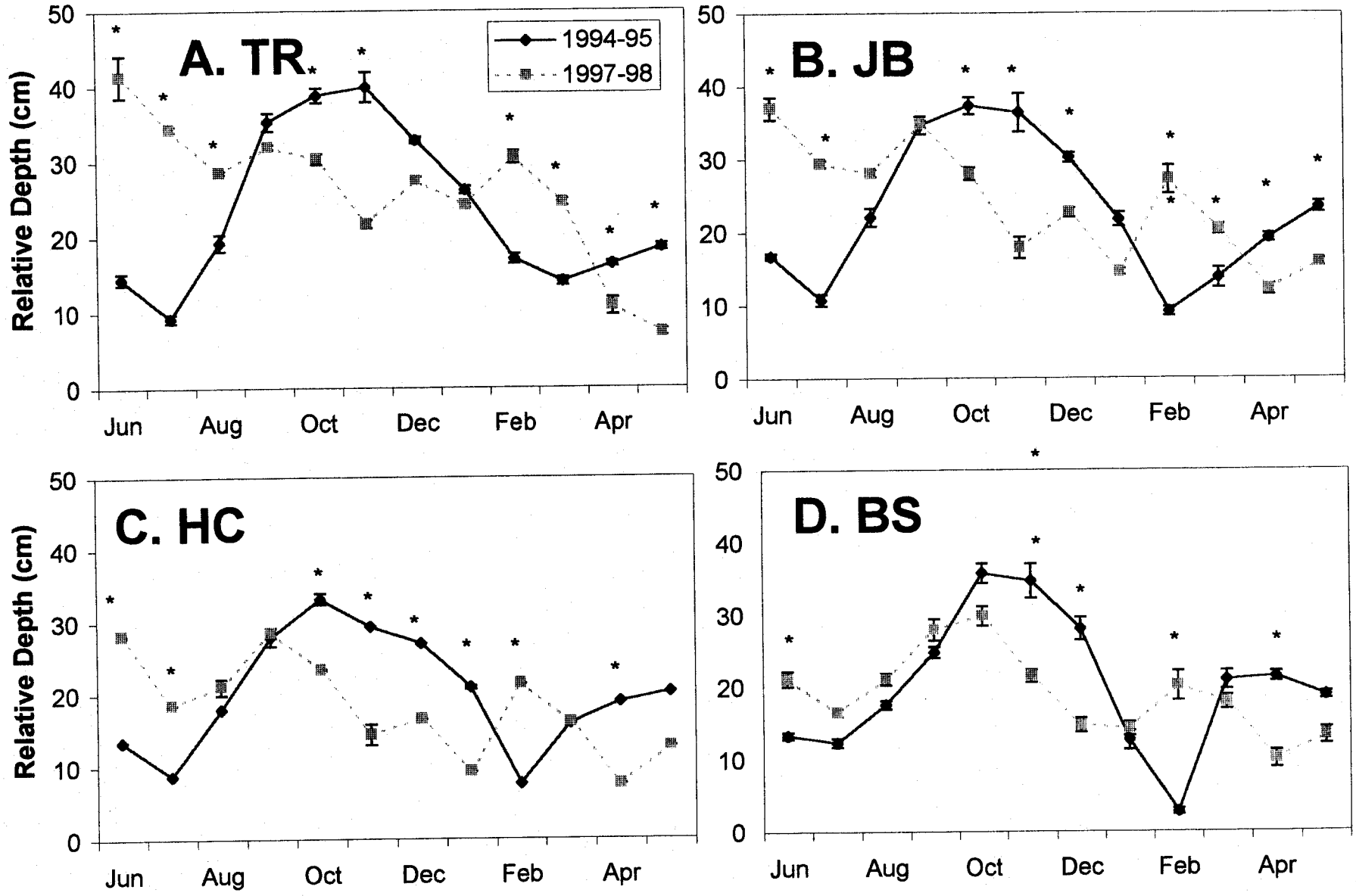


Figure F.5. Comparison of mean (±SE) relative depth between 1994-95 and 1997-98 for each collection site. Depth is in cm of water above the level of the mangrove flats. The flats begin to dry at 5 cm and are completely dry at 0 cm. Below 0 cm the only water is located in the central creek habitat. Asterisk(*) indicates significant ($p<0.01$) differences between years.

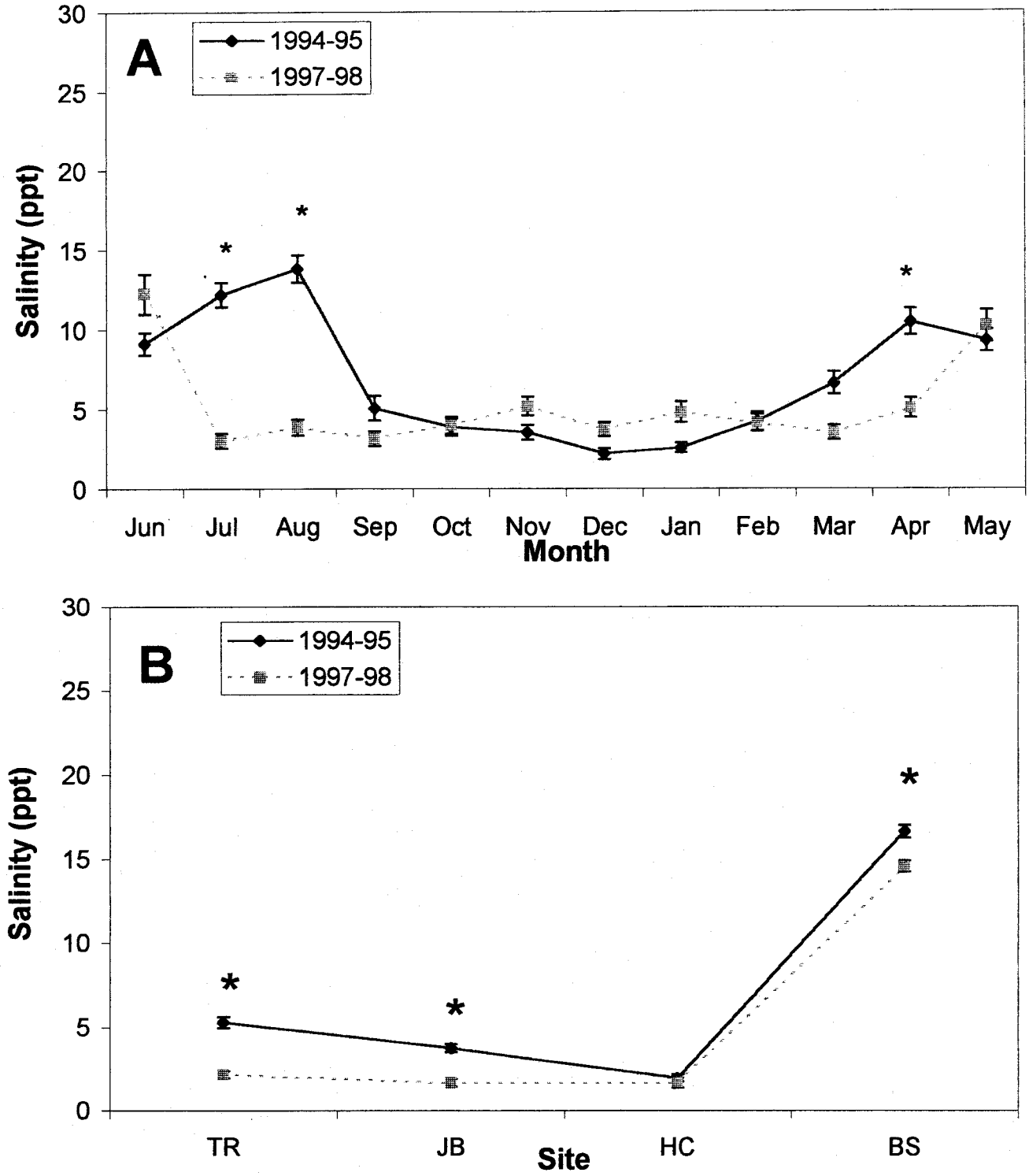


Figure F.6. Comparison of mangrove zone salinity (in parts per thousand) between 1994-95 and 1997-98 A. Mean (±SE) monthly salinity of four sites. B. Mean (±SE) annual salinity at four mangrove sites. Asterisk (*) indicates significant ($p<0.01$) differences between years.

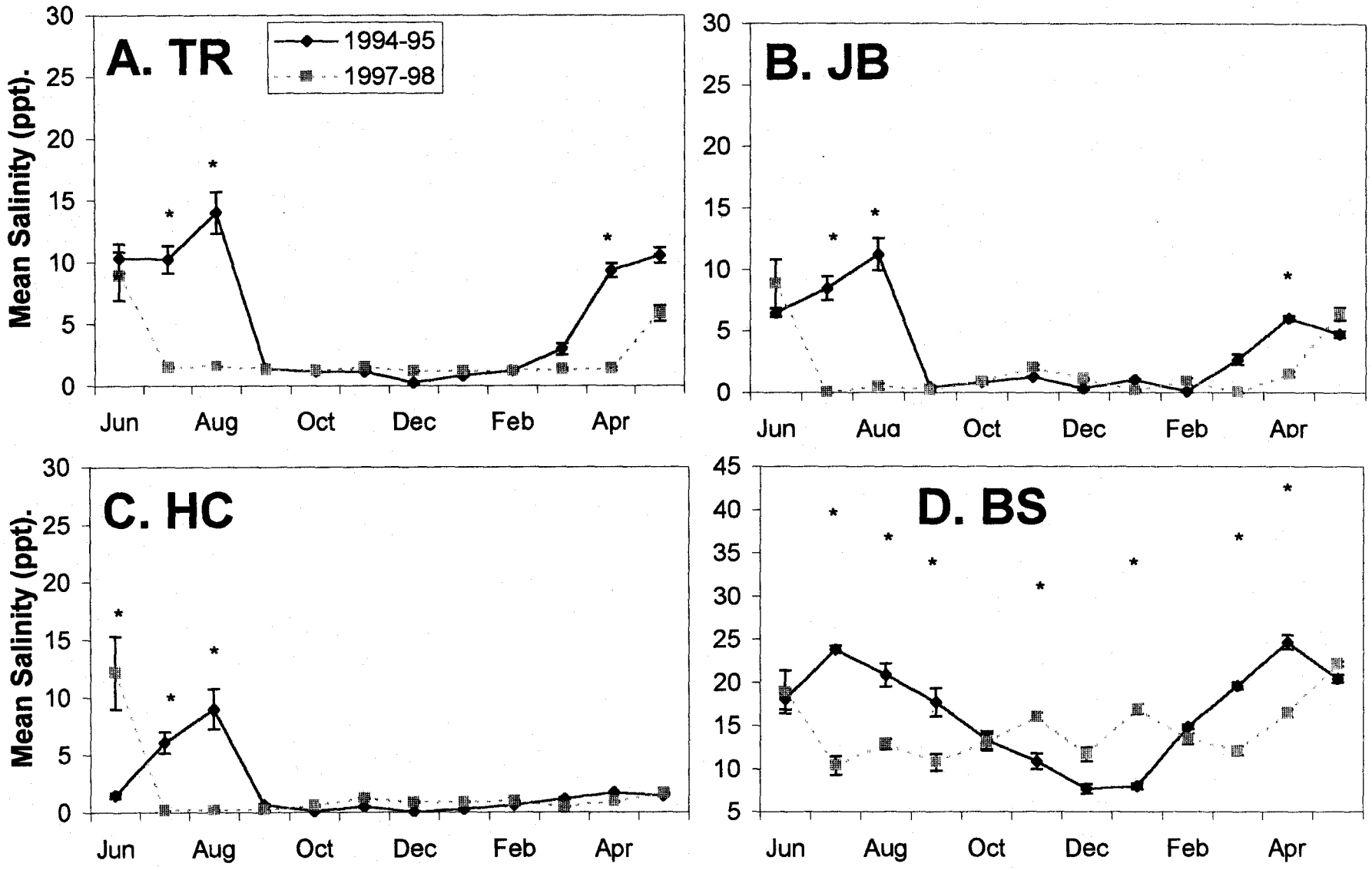


Figure F.7. Comparison of mean (±SE) monthly salinity (parts per thousand) between 1994-95 and 1997-98 for each mangrove zone collection site. An asterisk (*) indicates significant ($p<0.01$) differences between years.

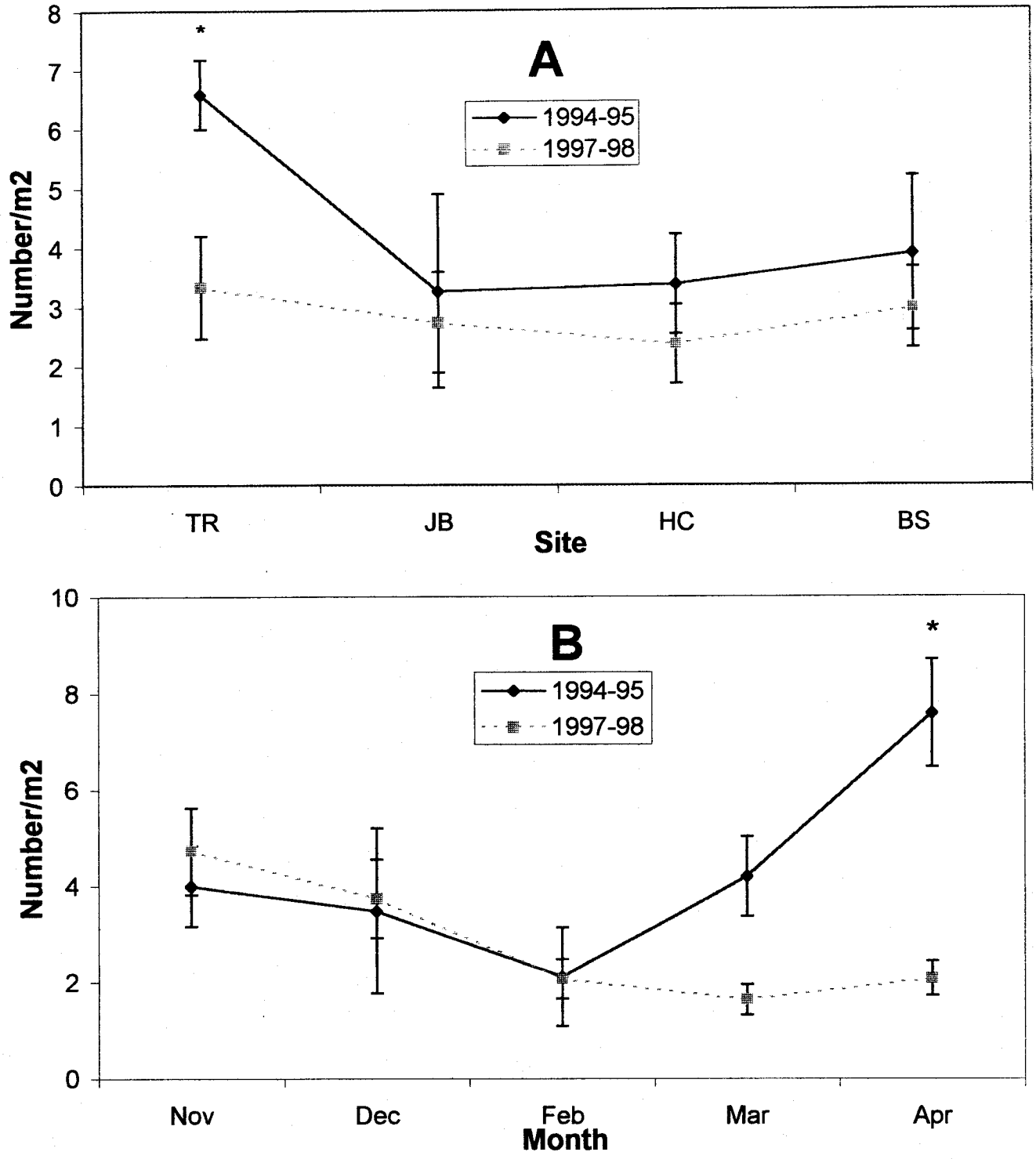


Figure F.8. Mean (±SE) stratified density per m^2 (± standard error) for the 1994-95 and 1997-98 collection years. A. Number of fish by site. B. Number of fish by month. An asterisk (*) indicates significant ($p<0.01$) differences between years.

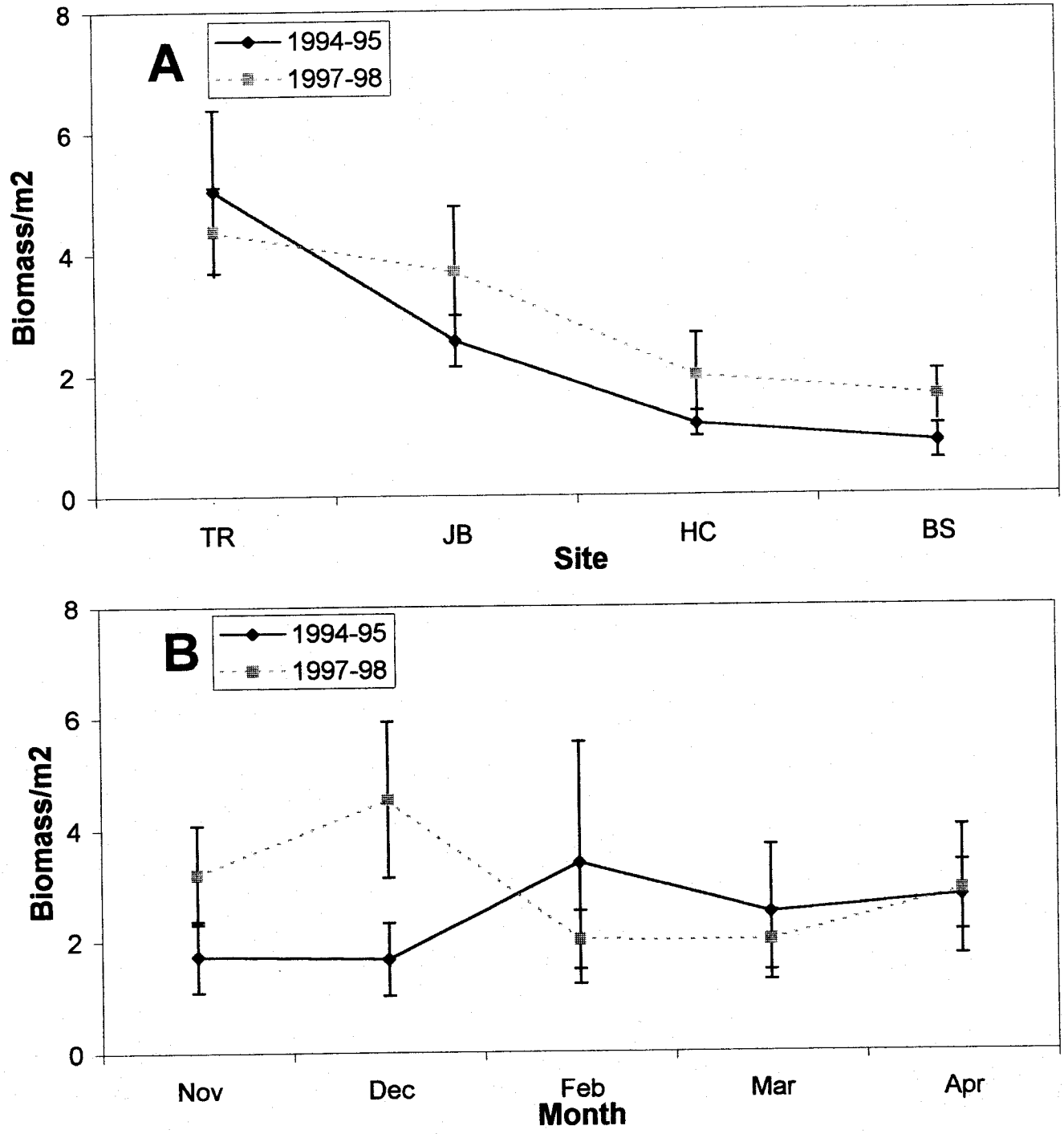


Figure F.9. Mean (±SE) stratified biomass (g) per m^2 (± standard error) for the 1994-95 and 1997-98 collection years. A. Biomass by site. B. Biomass by month. There were no significant difference between years for either interaction tested.

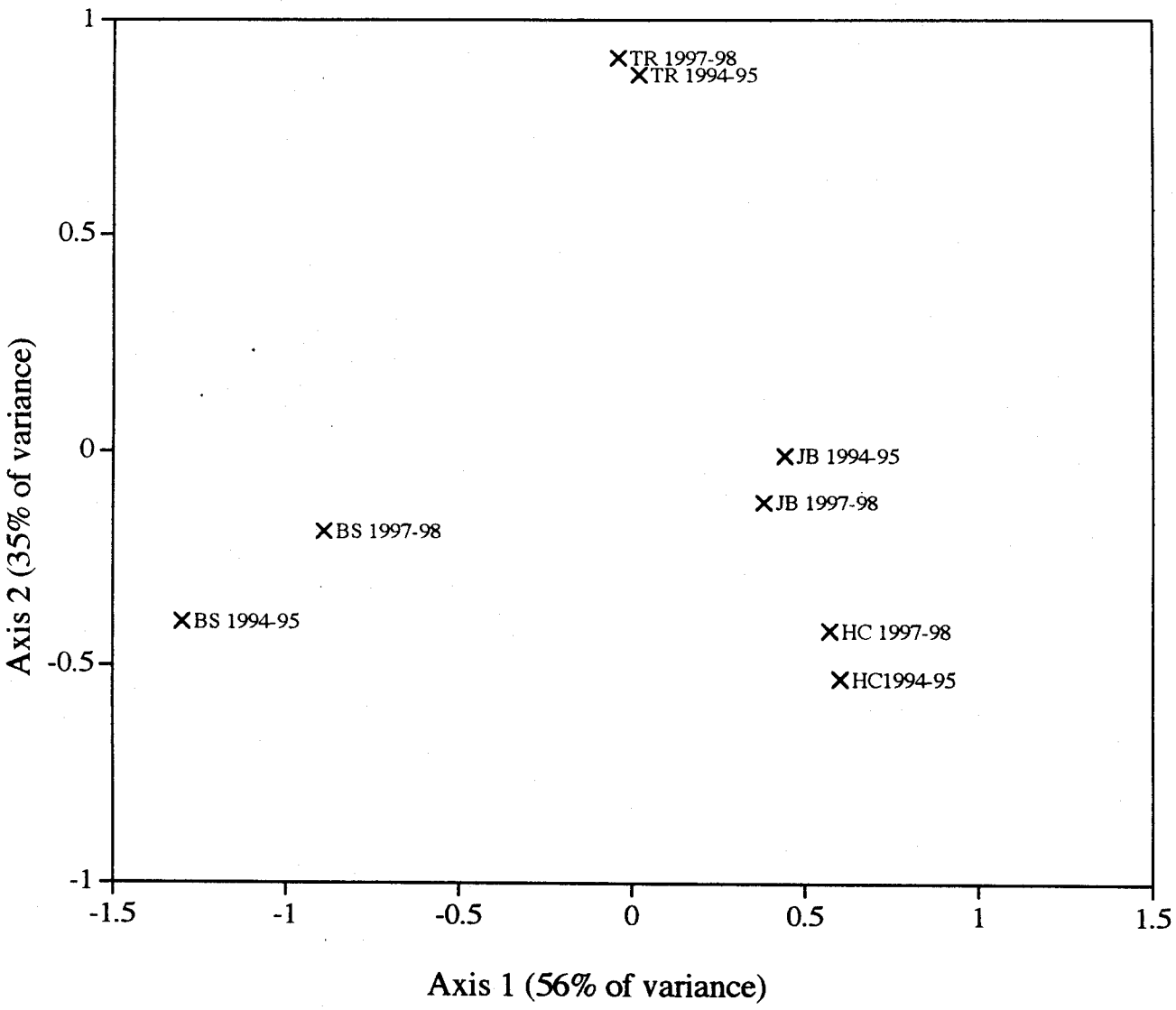


Figure 10. Plot of ordination scores from community structure correspondence analysis.

Appendix G. Test 7 Year 4 Ecological Monitoring Results: 1998-1999. An Analysis of the Hydrology and Resident Fishes within the Coastal Mangrove Wetlands of Everglades National Park

Jerome J. Lorenz, John Paul McLendon, Craig H. Faunce and David P.J. Green

ABSTRACT

The impact of Test 7 operations on the hydrology, hydrography and ecology of the mangrove wetlands of northeastern Florida Bay was examined for the hydrologic year 1998-99. An evaluation of 20 years of rainfall data indicated that 1992-93 was spatially and temporally similar to 1998-99, although 1992-93 experienced more rainfall overall. Test 7 was initiated after the 1995 dry season and therefore, a comparison of these two years allows for a classic before and after analysis. We hypothesized, that if Test 7 were effective, that the mangrove wetlands would experience similar conditions between the two years. Analyses of water level indicated very few differences between years, however salinity patterns were quite different. These differences were attributed to a lack of implementation of the Test 7 plan. Based on these findings, Test 7 probably had little or no impact on northeastern Florida Bay during the 1998-99 hydrologic year. This is not surprising since the substantive changes in operation were to occur during phase two of Test 7 and phase two has never been implemented. Furthermore, the operation schedule for phase one was repeatedly abandoned due to a very active hurricane season. Water managers responses to these events resulted in the loss of the regions wet season water supply culminating in a lack of freshwater during the dry season.

Surprisingly, there were few difference between the abundance prey base fishes and the community structure was not as anticipated based on previous findings. The majority of the evidence indicated that Test 7 had no impact on the physical environment so an alternate explanation for the surprising fish results was sought. A cogent explanation is that 1992-93 followed several years of drought while 1998-99 followed several high rainfall years. This past history was shown to have had an impact on the fish community structure. In conclusion, our analyses indicate that Test 7 had little or no impact on northeastern Florida Bay because Test 7 was not implemented.

1. INTRODUCTION

Implementation of Test Iteration 7 of the Experimental Program of Water Deliveries to Everglades National Park (ENP) officially began October 1, 1995 (USACOE 1995). Under the auspices of the Test 7 monitoring program, the charge was to evaluate the relative impact of Test 7 on the fishes of the coastal mangrove wetland that makes up the transition zone between the fresh water environs of the Taylor Slough/C-111 basins and Florida Bay. This report evaluates the impact of Test 7 during the period of June 1998 to May 1999. Hydroperiod and salinity of mangrove sites are affected by both rainfall and water management (Appendices A and D). As with previous years (Appendices E and F), the strategy used to evaluate Test 7 in this report was to identify a year similar in rainfall pattern to the subject year (1998-99). Once comparable rainfall years had been identified, comparisons of mangrove hydrology and aspects of the fish community were made between the years to see if the Test 7 year was different.

Statistical analysis. Critical regions for all Analyses of Variance (ANOVA) were set at the traditional $p<0.05$. Multiple means separations were performed for each significant ANOVA. Unless otherwise indicated, the critical region for least squares means post hoc tests was set at $p<0.01$ thus reducing the likelihood of Type I errors (Sokal and Rohlf 1980). The post hoc test used was Tukey's HSD test for unequal sample sizes (Statsoft 1995).

2. RAINFALL COMPARISONS BETWEEN YEARS

The National Oceanic and Atmospheric Administration operates rain collection gages at 26 locations across southern Florida (Table G.1) and publishes the data in annual summaries for the state. As reported for the previous two years (Appendices E and F), ANOVA and Correspondence Analysis (CA) was performed on the NOAA data in an effort to identify years with spatially similar annual rainfall patterns to 1998-99. Unfortunately, rainfall patterns in 1998-1999 were relatively unique. Although one year out of the last 20 had similar rainfall patterns (1987-1988), no water level, salinity or fish community data was available from that year, thereby precluding any comparisons. Therefore, CA was performed on years for which useful water level, salinity, and fish community data were available (1990-1999). In essence, the CA ordination technique condensed the distribution of data into a single point on a two dimensional graph. When plotted, points that are relatively close to each other represent distributions with similar patterns (ter Braak 1995). The primary and secondary axes of the CA

accounted for 37% and 20% of the temporal variability in rainfall across southern Florida, respectively (Figure G.2). The CA also indicated that 1992-1993 was the most similar in rainfall patterns to 1998-1999 (Figure G.2).

The results of correspondence analyses are somewhat subjective in that similarities and differences are relative to the distributions included in the analyses. Figure G.2 indicates that rainfall patterns in 1998-99 were more similar to 1992-93 than to any other of the 10 years used in the analysis, however, it does not actually indicate how similar the two years actually were. Direct comparisons of temporal changes were made between the two years through a two-way ANOVA of year and month across the 26 sampling sites. Although the relative temporal pattern between the two years was found to be very similar, the ANOVA results indicate the quantity of rain in 1992-1993 was significantly higher than in 1998-1999 ($F_{1,569}$=41.0, $p<0.01$). Furthermore, the significant interaction between month and year ($F_{11,569}$=42.3, $p<0.01$) indicates that the two years were significantly different in temporal aspects of the rainfall pattern.

Tukey's HSD *post hoc* test was used to examine the differences in temporal patterns between years (Figure G.3). The results indicated that during the wet season, rainfall between the two years (1998-1999 and 1992-1993) was fairly similar. Rainfall was much higher in June 1992 compared to June 1998, but the reverse was true in September, with 1998 experiencing significantly more rain than 1992. Effectively, the differences in rainfall between June and September probably had nullifying effect. Since the other wet season months were very similar, we concluded that the difference in the amount of water entering the watershed during the wet season was negligible between the two years. However, rainfall during the dry season was much greater in 1992-93, and therefore much more water entered the system during the dry season in 1992-1993 compared to 1998-99 (Figure G.3). In short, the major differences in rainfall between the Test 7 year (1998-1999) and the year prior to Test 7 (1992-1993) occurred during the dry season.

Test 7 called for an increase water delivery to Taylor Slough by increasing the pump capacity at S-332 (USACOE 1995) and a reduction in the amount of water exiting the system though the South Dade Conveyance System (SDCS), specifically through S-197. Under these operational standards, water that had previously been pumped to tide during the wet season (via the SDCS) would be retained within the Taylor Slough system under Test 7 (USACOE 1995). Therefore, because of Test 7 operations, there was presumably more freshwater in the slough at

the end of the wet season in 1998-1999 than in 1992-1993 even though the two years had similar wet season rainfall. The 1998-99 situation should have resulted in continued fresh water flow from the slough into northeastern Florida Bay well into the dry season as a result of the increased wet season water storage under Test 7 (Craighead 1971, Shoemer and Drew 1981, Lorenz 2000). In turn, this situation would affect the hydrology and ecology of the coastal wetlands during the dry season.

3. WATER LEVEL AND SALINITY

Introduction. Considering the above scenario (more wet season rainfall left in the system at the beginning of the dry season in 1998-99 than in 1992-93), we hypothesized that conditions in the mainland coastal wetlands were similar between the two subject years. During the wet season, the similar rainfall patterns between years would have resulted in similar conditions in the coastal wetlands. Although 1992-93 had more rainfall during the dry season, comparable dry season fresh water flow would be expected in 1998-1999 because more water would have been retained in the Taylor Slough watershed under Test 7 during the 1998 wet season. We will examine water level and salinity patterns to test this hypothesis. Furthermore, ecological similarity between years will also be examined through an analysis of the resident demersal fish community in the coastal wetlands.

Theoretically, this approach seems like a logical way of analyzing the impact of Test 7. However, the reality of the situation was that the designs set forth in Test 7 were not followed during the 1998-99 hydrologic cycle. The substantive changes to the system were to occur in Phase 2 of Test 7 (USACOE 1995), which was never initiated. Furthermore, the protocol set for phase 1 was all but abandoned during 1998-99. Phase 1 called for an increase water delivery to Taylor Slough by increasing the pump capacity at S-332 to 495 cfs (USACOE 1995). This volume would allow water that had previously been pumped to tide via the SDCS, to remain within the Everglades system. Under this plan, the amount of water exiting the system though the SDCS, specifically through S-197, would be greatly reduced. However, a very active hurricane season resulted in the use of S-197 contrary to this plan. In August 1998, hurricanes Bonnie and Danielle threatened southern Florida. In preparation for possible high rainfall from these storms, water managers released water from the system through coastal canal structures. As the storms turned north while still well off the east coast, they actually inhibited rainfall over

the southern peninsula. In September and November, Hurricane Georges and Tropical Storm Mitch swept across the Everglades, prompting managers to again open S-197. These events resulted in the loss of massive amounts of fresh water from the system. In addition to the liberal use of S-197, the pump capacity at S-332 was limited to less than 165 cfs (as opposed to 465 maximum capacity) from January through May 1999 to prevent flooding of nesting areas for the endangered Cape Sable Seaside Sparrow.

As a result of these exceptions to Test 7, storage capacity of the system was no greater under Test 7 than it had been in prior years. Based on the actual operation of the SDCS during 1998-1999, we would expect that our hypothesis (that 1992-1993 and 1998-1999 would have similar hydrographic, hydrologic patterns and fish community structure) would be rejected and that the alternative hypothesis (that 1992-93 would have longer hydroperiods, lower salinity and a more abundant and diverse fish community compared to 1998-99) would be accepted.

Methods. The methods for the collection of water level and salinity data are presented in the main text of this report. Water level and salinity were analyzed using a 3 way ANOVA for the effects of site, year, and month for 1992-93 and 1998-99.

Results. The ANOVA of water level revealed significant two-way interactions between site and year ($F_{3,2903}=6.23$, $p<0.01$) and between month and year ($F_{11,2887}=36.64$, $p<0.01$). Out of the four fish sampling sites (Figure G.1), only TR experienced a significant difference in mean annual water depth between the two years, with water level being higher in 1992-93 compared to 1998-99 (Figure G.3A). Although not statistically different, mean annual water level was also higher in 1992-93 at JB and HC. Interestingly, the control site (BS) had higher mean water level in 1998-99 (Figure G.3A). The *post hoc* tests for the month-year interaction indicated that there were significant differences in water levels between the two years during the early wet season, however, by the late wet season (November and December) mean water levels were very similar between the two years (Figure G.3B). With the exception of May, there were no significant differences in water level during the dry season (Figure G.3B). A significant three-way interaction between site, month and year ($F_{33,2815}=6.92$, $p<0.01$) indicated that the pattern of water level rise and fall varied significantly between the years at all the sites, however, most of the difference appears to have occurred in June, October and May (Figure G.4).

The ANOVA of salinity indicated no interaction between site and year, however, the ANOVA did indicate significant differences between years ($F_{3,2876}=90.5$, $p<0.01$) and sites

($F_{3,2876}$=408.4, $p<0.01$) independently. A comparison of means indicates that all sites had higher mean annual salinity in 1998-99 compared to 1992-93 (Figure G.5A), thereby explaining the lack of an interaction. There were significant two-way interactions between month and year ($F_{11,2851}$=72.8, $p<0.01$). Means separations of the month and year interaction indicated that, during most of the year, salinity was higher in 1998-99 compared to 1992-93 (Figure G.5B). The exception, were June and the peak of the wet season (October and November), when salinities were lower in 1998-99 than in 1992-93 (Figure G.5B). A significant 3-way interaction between site, month and year ($F_{33,2779}$=24.8, $p<0.01$) indicated that the annual salinity pattern was different between the control site (BS) and the three sites influenced by water management (TR, JB, and HC). With the exception of June, the three management-impacted sites showed trends in salinities that were higher in 1998-99 during both the early wet season and late dry season (Figure G.6A, 6B, and 6C). Although, this trend was repeated at the control site, the difference between BS and the other sites was a significantly lower salinity during the peak of the wet season during 1998-99 compared to 1992-93 (Figure G.6D).

Discussion. The analysis of rainfall indicated that, overall, 1992-93 experienced significantly more rainfall than 1998-99 (Figure G.2B). The site-year interaction in water level reflected this difference in rainfall with TR experiencing higher mean annual water level in 1992-93 compared to 1998-99 (Figure G.3A). JB and HC also had higher mean annual water level in 1992-93, although the *post hoc* tests were not significantly different for these sites (Figure G.3A).

The results of the two-way ANOVA for month and year indicate that the difference in water level between the two years primarily occurred during the wet season (Figure G.3B) and also reflect wet season rainfall patterns (Figure G.2B). For example, rainfall was significantly higher in June 1992 than in June 1998 (Figure G.2B) and, correspondingly, water level followed the same pattern (Figure G.3A). Likewise, more rain fell in September 1998 than September 1992 (Figure G.2B) and this was reflected in higher water levels in 1998 (Figure G.3B).

During the period of transition from wet to dry season (November-December), water levels became almost identical between the two years, and remained similar through the dry season to May (Figure G.3B). ANOVA results indicated that during the dry season, 1992-93 water levels were the same or significantly lower than the 1998-99 (Figure G.3B, Figure G.4), even though rainfall was significantly higher in 1992-93 (Figure G.2B). These data support the

stated hypothesis that, through the implementation of Test 7, more fresh water was retained in the system during 1998-99 compared to 1992-93, thereby accounting for the similarity in dry season water levels even though there was a significant difference in rainfall.

However, if management activities did account for the similarity in water level between years, this should only have occurred at the three sites impacted by water management. Since BS acts as a control site, higher rainfall during the 1992-93 dry season should have resulted in higher water level relative to 1998-99. That water level was actually lower during the 1992-93 dry season at this site (Figure G.4D) indicates that something other than water management was responsible for the observed similarity in dry season water levels at all the sites. Seasonal changes in sea level and wind events have a profound impact on water levels in the coastal wetlands (Holmquist et al. 1989, Lorenz and Harrington 1994). In turn, seasonal changes in sea level are determined by larger scale weather patterns (Blaha 1984). The similarity between the two years, even though rainfall was significantly different, may be attributable a more mild winter in 1999 than in 1993 (personal observation).

As was previously stated, Test 7 was only partially implemented and the designed protocol was abandoned during critical periods. An example of the impact of such deviations from protocol was apparent in our analyses. Hurricane Georges made landfall in September 1998. This storm dumped massive amounts of rain resulting in more than twice the rainfall compared to September 1992 (Figure G.2B). In a direct contradiction to the specific design of Test 7, water managers fully opened the control structure at S-197, thereby allowing the regional water supply to be dumped to tide. The following month, water level in the coastal wetlands was significantly lower even with the massive rainfall associated with Georges. An examination of mean water level at the individual sites strongly indicates that the relatively fast recession in water level following Georges was attributable to the actions of water managers (Figure G.4). At BS, the management control site, water levels increased from September to October 1998 (Figure G.4D), while all three of the sites impacted by operation of S-197 showed a decline over the same period (Figure G.4A-C). In contrast, Hurricane Andrew hit southern Florida in August 1992 and dumped a comparable amount of rain to Hurricane Georges (Figure G.2B). At that time, the control structure at S-197 was only recently commissioned (less than two months), probably accounting for very limited use during Hurricane Andrew (Ley et al. 1995). Predictably, water level increased from August to October in 1992 (Figure G.3B). The differences in the response

of coastal wetland water levels to these two hurricanes clearly indicates how the use of S-197 for flood control can have a detrimental impact on retaining the wet season water supply.

In the coastal mangrove wetlands, salinity is not as likely to fluctuate with wind events as water level. Since salinity changes primarily in response to freshwater runoff and seasonal changes in sea level, it is a better indicator of the impact of water management than water level. The results of the two-way ANOVA for site and year further indicate that Test 7 had limited, if any, impact on the physical conditions in the coastal wetlands. All sites had significantly higher annual salinity in 1998-99 than in 1992-93 (Figure G.5A). Furthermore, the difference between years at BS was similar to the differences at the management impacted sites (as evidenced by the lack of a two-way ANOVA interaction between site and year). If Test 7 were having an impact, the differences at these sites should have been less pronounced than at BS.

Monthly differences in salinity further indicated the inability of managers to stick to the Test 7 operational plan and the subsequent impact on the environment. Salinity was significantly lower during the late wet season of 1998 compared to that of 1992 (Figure G.5B). This was likely the result of the release of fresh water at S-197 following Hurricane Georges and Tropical Storm Mitch. Although BS generally acts as a Test 7 control (due to the fact that it is impounded in relation to Taylor Slough flows), releases through S-197 (a direct violation of Test 7 protocol) can have a profound impact on the site by lowering salinity throughout Barnes Sound. Lower monthly salinity at BS in October through December 1998 compared to 1992 (Figure G.6D) clearly indicates the impact of S-197 operations on the marine environment of Barnes Sound following Hurricanes Georges and Tropical Storm Mitch.

The impact of these dumping events was not immediately apparent at the other sites. However, the rapid increase in salinity at all the sites from February through May 1999 was a direct result (Figure G.6). At the end of the dry season, the three sites that should have benefited from Test 7 were under marine (Figure G.6A&B) or hypersaline conditions (Figure G.6C). By February there simply was no fresh water available in the system to move into Taylor Slough (SFWMD monthly surface water condition reports). If fresh water had been retained in the Everglades watershed rather than pumped to tide as a result of storm preparation, dry season freshwater flow would have continued through the coastal wetlands until later in the dry season thereby maintaining low stenohaline conditions in the coastal wetlands. The relatively low

salinity during these same months in 1993 indicate what conditions might have been like at the sites if Test 7 protocol had been followed.

A cursory examination of water level indicated that Test 7 might have had a positive impact on physical conditions in the coastal mangrove wetlands. However, based on the documented deviations from Test 7 protocol and on in depth examinations of both water level and salinity, it appears that conditions in the coastal wetlands were less favorable to prey-base fishes during Test 7-Year 4 (1998-99) than in a similar year prior to Test 7 (1992-93). Based on these findings, an analysis of the fish community would expect to indicate greater abundance in 1992-93 compared to 1998-99.

4. IMPACT ON MANGROVE FISHES

Introduction. Although analyses of the impact of Test 7 on water level and salinity indicated that Test 7 had little impact on the mangrove environment, an examination of the fish community could help validate these findings. Previous analyses indicated that fish abundance and community structure are linked to salinity and water level (Appendix D). Based on this finding, the null hypothesis tested in this section is that the coastal mangrove wetlands the fish community (fish abundance and community structure) did not differ between 1992-93 and 1999-99 at any of the four sites. Should the null hypotheses be rejected, a reasonable conclusion might be to attribute any differences in these biological parameters between the two years at the experimental sites to the implementation of Test 7. However, based on actually canal operations and on the findings for water level and salinity, we expect to accept the null hypothesis. More specifically, we would expect a greater abundance of fish in 1992-93 based on the more favorable hydrologic and hydrographic conditions.

Methods. The methods for the collection of fish samples are summarized in the main text of this report and presented in detail in Appendix A. As described in the main text of this report, standardized numerical manipulations were performed on the data in preparation for statistical analyses. Estimates of density and biomass per square meter of wetland for each of the two years were examined with ANOVA and CA.

Results. A thorough presentation of each sample collection is presented in Appendices B and C. The percent of catch by site for all species collected is summarized for 1992-93 in Table G.2 and for 1998-99 in Table G.3. Total percent for all sites combined, total number of species

and individuals collected, and total sampling effort are also provided in these tables. Sheepshead minnow (Cyprinodon variegatus) and mosquitofish (Gambusia holbrooki) showed the largest increase while Mayan cichlids (Cichlasoma urophthalmus) and clown gobys (Microgobius gulosus) showed the greatest decrease in percent catch from 1992-93 to 1998-99. Other than these species, the differences in percent catch by species were negligible between years, however, more species were collected in 1998-99 (26) than in 1992-93 (19).

There was no significant interaction between site and year ($F_{3,56}$=0.48, p>0.05), however, an analysis of means (Figure G.7A) indicated that, although not significant, density was higher at all sites in 1998-99 than in 1992-93. This difference between years was found to be marginally significant ($F_{1,56}$=.059), with 1998-99 averaging 4.74 fish/m^2 (SE=0.59) while 1992-93 averaged 3.43 fish/m^2 (SE=0.36). There was a significant interaction between years and months ($F_{7,48}$=4.4, p>0.05), however, a plot of the means indicated that the months were similar, with only March having a significant difference between years (Figure G.7B).

Analysis of variance indicated no significant difference in biomass per m^2 ($F_{1,56}$=3.06, p>0.05) between years. 1992-93 averaged 2.8g of fish per m^2 (SE=0.45) and 1998-99 averaged 3.8g of fish per m^2 (SE=0.47). There was no significant interaction between site and year ($F_{3,56}$=1.0, p>0.05), and the means separation indicated that the sites were similar across the two years (Figure G.8A). There was no interaction between years and months ($F_{7,48}$=0.57, p>0.05) and a plot of the means indicated that the months were very similar (Figure G.8B).

The primary and secondary axis of the CA explained 40% and 19% of the variability in community structure between sites and years (Figure G.9). Axis 2 indicates differences in community structure between years at all sites, with the exception of BS: 1992-93 scores for HC, JB, and TR are less than zero on Axis 2 while all 1998-99 are greater than zero.

Discussion. Based on the analyses of hydrology and hydrography, we predicted that fish abundance would be different between the two years. Because 1992-93 had more favorable hydrologic and hydrographic conditions, higher density and biomass were expected (based on the analyses presented in Appendix D). However, the data presented indicated that biomass was not significantly different in both years and that 1998-99 actually had higher densities of fish than 1992-93. These findings appear to contradict the conclusions derived from the analyses of physical conditions in the coastal wetlands. One possible explanation may be that Test 7 did have an impact on the delivery of water to the coastal wetlands, resulting in a positive impact on

the prey base fish community. However, the preponderance of physical evidence presented in the previous section convincingly indicates the contrary. Therefore, an alternative explanation for these paradoxical results was formulated based on the findings from other analyses.

The analysis of fish community structure provided some insight into resolving the seeming contradiction. Fish community structure is highly sensitive to changes in the physical environment, especially salinity (Appendix D). Because BS is impounded from freshwater sheetflow, it can be characterized as a stenohaline marine environment compared to the other sites. As such, it is relatively rich in marine fish species but depauperate in freshwater species (Lorenz 1997). This environmental stability explains why the fish community at BS was similar for the two subject years relative to differences between years at the other sites (Figure G.9). That the communities at the other sites were more similar to BS in 1992-93 than in 1998-99 indicates that marine species were better represented than freshwater species in 1992-93. For this to have occurred, salinity at the sites had to be closer to marine than to freshwater prior to the 1992-93 hydrologic year. This must have been particularly true at JB and HC since the community structure in 1992-93 very closely resembled that at BS.

The findings of the CA suggest that the condition of the fish community in 1992-93 and 1998-99 may have (to some degree) been dictated by physical conditions that occurred prior to the period analyzed. Since 1992-93 followed several years of drought conditions (Appendix D) and 1998-99 followed several consecutive years of above average rainfall (Appendices E &F), an examination of this possibility was indicated. The possible impact of previous physical conditions was evaluated by examining indices of hydroperiod and low salinity period for the year prior to each sample collected.

5. AN ASSESSMENT OF PHYSICAL CONDITION PRIOR TO FISH COLLECTIONS

Methods. The Dryness Index (DI) was defined as the number of days out of the year prior to sample collection that relative water level was less than 5cm on the mangrove flats. This criterion was selected because this is the depth at which parts of the wetland become exposed. Differences in the DI between years were examined with ANOVA. Results indicate significant interactions between site and year ($F_{3,56}=26.37$, $p<0.05$) and month and year ($F_{7,48}=2.04$, $p<0.05$). Similar to the DI, the Low Salinity Index (LSI) was defined as the number of days out of the year prior to sample collection that salinity was less than 5ppt. This criterion was selected

based on observations that certain aquatic plant species that are generally abundant in low salinity conditions become visibly stressed above 5ppt.

Results and Discussion. An examination of mean DI's indicated that samples in 1992-93 at TR, JB, and HC had more dry days in the year prior to the collection than samples in 1998-99 (Figure G.10A). Monthly means indicated that most of the dry days in 1992-93 occurred prior to June (Figure G.10B), thereby explaining why mean water level (Figure G.3) did not reflect the dry conditions that impacted the fish community. Length of hydroperiod was previously demonstrated to have a demonstrable impact on the density of fish (Appendix D). This is somewhat intuitive. The longer the entire wetland is flooded, the more time fish have to exploit the ephemeral wetlands and the less time they are available to predators during concentration events (DeAngelis et al. 1997). Therefore, shorter hydroperiods prior to June 1992 may account for the unexpectedly low density of fish observed in 1992-93.

ANOVA of LSI also indicated a significant site-year interaction ($F_{3,56}=7.66$, $p<0.05$). An examination of the mean LSI's indicated that, at HC, the number of days salinity was less than 5ppt was lower for 1992-93 samples than for 1998-99 samples (Figure G.11A). TR and JB also had fewer low salinity days in reference to samples collected in 1992-93, however, the differences were not significant. Although there was no interaction between month and year, mean LSI's indicated that samples collected early in 1992-93 were subject to fewer low salinity days than in 1998-99 (Figure G.11B). Previous analyses indicated that the number of days salinity was less than 5ppt was a determinant of fish biomass (Appendix D). A likely explanation for this phenomena is that salinity stress may result in less efficient primary and secondary production, thereby resulting in lower fish biomass. Therefore, the lack of long periods of continuously low salinity prior to sample collection may account for the unexpectedly low biomass observed in 1992-93. Furthermore, since salinity was found to be the primary determinant of community structure (Appendix D), the low LSI's tabulated for 1992-93 may indicate why community structure at TR, JB and HC was more similar to BS than in 1998-99.

6. SYNTHESIS, CONCLUSIONS, AND SUMMARY

Although 1992-93 experienced significantly more rain than the subject year (1998-99), the combined results of the temporal and spatial analyses of annual rainfall patterns indicated similarities between the two years. Comparisons of physical and biological parameters in the

coastal mangrove wetlands between these two years were used to evaluate Test 7. We hypothesized that if Test 7 were functioning according to plan, the two years would be similar in physical attributes even though the two years experienced different amounts of rainfall. However, based on an assessment of the actual operational protocol of the SDCS during 1998-99, we suspected that Test 7 had little impact and the two years would be different in water level and salinity patterns.

Analyses of water level and salinity demonstrated that physical conditions in the coastal mangrove wetlands were very different between the two years. Although water levels were not entirely dissimilar, the salinity analyses clearly indicated that the amount of fresh water being delivered to the coastal wetlands was much lower in 1998-99. Furthermore, the timing of freshwater deliveries was also very different indicating that operations under Test 7 failed to produce the desired result of retaining freshwater in the wetlands until late in the dry season. These findings convincingly led to the conclusion that the operational plan for Test 7 was not followed during the subject year, and, therefore, had no positive impact.

Previously, mangrove fish density was demonstrated to be at least partially determined by length of hydroperiod (Appendix D). Furthermore, biomass production in mangrove fishes has been shown to be related to long term salinity patterns (Appendix D). Based these findings and those expressed in the previous paragraph, mangrove fish were expected to be less abundant in 1998-99 compared to 1992-93. However, analyses of fish collections indicated very little differences between the years and, in some cases, indicated that fish were more abundant in 1998-99 than in 1992-93.

An analysis of fish community structure provided some insight into the seeming paradox between the physical and biological components of the study. The CA indicated that the fish community structure in 1992-93 was more closely related to the marine site (BS) than the community structure in 1998-99. For this to occur, marine conditions must have predominated at the sites prior to sample collections in the 1992-93 hydrologic year. DI and LSI were used to demonstrate that conditions were less favorable to fish production in the period prior to 1992-93 and were more favorable prior to 1998-99, thereby possibly explaining the paradoxical results of the physical and biological components of the study.

This report attempted to evaluate the impact of Test 7 on the coastal mangrove ecosystem. Test 7 was expected to retain more fresh water within the system during the wet

season so that fresh water flow would continue into the dry season, thereby impacting the biota of the region. Based on the above results, we reject the hypothesis that 1992-1993 and 1998-1999 had similar hydrographic, hydrologic patterns and fish community structures. The reason for the lack of observed impact of Test 7 was that the proposed operational changes were never fully implemented. Those changes that were initiated were then abandoned during the late wet season. The implication is not that Test 7 was a failure, rather that the implementation of Test 7 failed. As stated in previous years, Test 7 can not be evaluated until it is implemented.

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Table G.1. NOAA rainfall gage locations

Everglades Division	**Lower East Coast Division**
Belle Glade	Coral Springs
Canal Point	Ft Lauderdale
Clewiston	Hialeah
Devils Garden	Homestead
Everglades	Loxahatchee
Flamingo	Miami Beach
Fort Myers	Miami Airport
Immokalee	Perrine
La Belle	Pompano Beach
Moore Haven	Royal Palm
Naples	Stuart
Oasis	West Palm Beach
Punta Gorda	
Tamiami	

Table G.2 Phylogenetic list of all species sampled and the percent of catch at each site in 1992-93. Percent catch for all sites combined, total fish collected per site, number of species collected, number of dates and total nets sampled are also included. All fish collected are represented, however, only fish less than 6.5 cm were used in subsequent analyses. Species used in the community analysis (CA) are marked with an asterisk (*).

ORDER Family Genus species	Common Name	TR	JB	HC	BS	All Sites
SILURIFORMES						
Ictaluridae	Freshwater catfish					
Ameiurus natalis	Yellow Bullhead	0.0	0.0	0.0	0.0	0.0
Noturus gyrinus	Tadpole Madtom	0.0	0.0	0.0	0.0	0.0
Clariidae	Labyrinth Catfishes					
Clarias batrachus	Walking Catfish	0.0	0.0	0.0	0.0	0.0
BATRACHOIDIFORMES						
Batrachoididae	Toadfishes					
Opsanus beta (juv)	Gulf Toadfish	0.0	0.0	0.0	0.0	0.0
ATHERINIFORMES						
Atherinidae	Silversides					
Menidia sp*	Inland Silverside	1.2	2.0	2.3	9.4	3.7
Belonidae	Needlefishes					
Strongylura notata (juv)	Redfin Needlefish	0.1	0.0	0.0	0.0	<0.1
Cyprinodontidae	Killifishes					
Adinia xenica*	Diamond Killifish	0.0	0.0	0.2	0.0	<0.1
Cyprinodon variegatus*	Sheepshead Minnow	2.7	6.6	20.6	10.0	9.5
Floridichthys carpio*	Goldspotted Killifish	2.2	2.9	18.1	24.9	11.2
Fundulus chrysotus	Golden Topminnow	0.0	0.0	0.0	0.0	0.0
F. confluentus*	Marsh Killifish	0.1	0.6	2.1	0.0	0.7
F. grandis*	Gulf Killifish	0.3	3.9	11.3	1.8	4.2
F. seminolis	Seminole Killifish	0.0	0.0	0.0	0.0	0.0
F. similis	Longnose Killifish	0.2	0.3	0.7	0.8	0.5
Jordanella floridae*	Florida Flagfish	0.0	0.0	0.0	0.0	0.0
Lucania goodei*	Bluefinned Killifish	0.0	0.0	0.0	0.0	0.0
Lucania parva*	Rainwater Killifish	40.1	25.5	21.0	15.8	25.1
Poeciliidae	Livebearers					
Belonesox belizanus	Pike Killifish	0.1	0.9	0.2	0.0	0.4
Gambusia holbrooki*	Mosquitofish	0.0	0.2	0.2	0.2	0.2
Poecilia latipinna*	Sailfin Molly	4.0	10.3	11.3	6.6	8.3
CYPRINIFORMES						
Cyprinidae	Minnows					
Notropis sp	Shiner	0.0	0.0	0.0	0.0	0.0
Catostomidae	Suckers					
Erimyzon sucetta	Lake Chubsucker	0.0	0.0	0.0	0.0	0.0
GASTEROSTEIFORMES						
Syngnathidae	Pipefishes					
Syngnathus louisianae	Chain Pipefish	0.0	0.0	0.0	0.2	<0.1
PERCIFORMES						
Gerreidae*	Mojarras	0.1	0.1	0.2	5.4	1.4
Gobiidae	Gobies					
Gobiosoma bosc	Naked Goby	0.0	0.0	0.0	0.0	0.0
Gobiosoma robustum	Code Goby	0.0	0.0	0.0	0.0	0.0
Lophogobius cyprinoides*	Crested Goby	4.6	0.0	0.0	0.0	0.9
Microgobius gulosus*	Clown Goby	15.4	1.8	1.5	24.7	10.0
Centrarchidae	Sunfish spp.	0.7	2.5	0.1	0.0	1.0
Elassoma evergladei	Pygmy Sunfish	0.0	0.0	0.0	0.0	0.0
Enneacanthus gloriosus	Blue Spotted Sunfish	0.0	0.0	0.0	0.0	0.0

Lepomis marginatus	Dollar Sunfish	0.0	0.0	0.0	0.0	0.0
Lepomis punctatus	Spotted Sunfish	0.0	0.0	0.0	0.0	0.0
Lepomis microlophus	Redear Sunfish	0.0	0.0	0.0	0.0	0.0
Micropterus salmoides	Largemouth Bass	0.0	0.0	0.0	0.0	0.0
Cichlidae	Cichlids					
Cichlasoma bimaculatum	Black Acara	0.0	0.0	0.0	0.0	0.0
C. urophthalmus*	Mayan Cichlid	27.6	42.1	10.2	0.0	22.4
Tilapia mariae*	Spotted Tilapia	0.6	0.2	0.0	0.0	0.2
PLEURONECTIFORMES						
Soleidae	Soles					
Trinectes maculatus	Hogchoker	0.0	0.0	0.0	0.2	<0.1
Totals		1205	2116	1235	1464	6020
Number Of Species		15	15	15	12	19
Number Of Nets Sampled		41.0	45.0	43.0	39.0	168.0
Number Of Dates Sampled		8.0	8.0	8.0	8.0	32.0

Table G.3. Phylogenetic list of all species sampled and the percent of catch at each site 1998-99. Percent catch for all sites combined, total fish collected per site, number of species collected, number of dates and total nets sampled are also included. All fish collected are represented, however, only fish less than 6.5 cm were used in subsequent analyses. Species used in the community analysis (DCA) are marked with an asterisk (*).

ORDER Family Genus species	Common Name	TR	JB	HC	BS	All Sites
SILURIFORMES						
Ictaluridae	Freshwater catfish					
Ameiurus natalis	Yellow Bullhead	0.0	0.0	0.0	0.0	0.0
Noturus gyrinus	Tadpole Madtom	0.0	0.1	0.0	0.0	<0.1
Clariidae	Labyrinth Catfishes					
Clarias batrachus	Walking Catfish	0.1	0.0	0.0	0.0	<0.1
BATRACHOIDIFORMES						
Batrachoididae	Toadfishes					
Opsanus beta (juv)	Gulf Toadfish	0.0	0.0	0.0	0.2	0.0
ATHERINIFORMES						
Atherinidae	Silversides					
Menidia sp*	Inland Silverside	5.4	7.7	0.0	1.2	3.3
Belonidae	Needlefishes					
Strongylura notata (juv)	Redfin Needlefish	0.0	0.0	0.0	1.6	0.3
Cyprinodontidae	Killifishes					
Adinia xenica*	Diamond Killifish	0.0	0.0	5.3	0.6	1.9
Cyprinodon variegatus*	Sheepshead Minnow	4.7	13.2	50.1	31.0	27.1
Floridichthys carpio*	Goldspotted Killifish	0.0	0.0	0.0	20.5	4.1
Fundulus chrysotus	Golden Topminnow	0.0	0.0	0.0	0.0	0.0
F. confluentus*	Marsh Killifish	3.7	2.6	17.5	3.5	8.0
F. grandis*	Gulf Killifish	0.0	0.0	1.1	0.4	0.4
F. seminolis	Seminole Killifish	0.0	0.0	0.0	0.0	0.0
F. similis	Longnose Killifish	0.1	0.1	0.0	0.0	<0.1
Jordanella floridae*	Florida Flagfish	1.9	0.2	0.3	0.0	0.6
Lucania goodei*	Bluefinned Killifish	15.2	2.6	0.2	0.0	4.1
Lucania parva*	Rainwater Killifish	10.8	35.6	3.9	27.3	18.0
Poeciliidae	Livebearers					
Belonesox belizanus	Pike Killifish	0.3	0.4	0.1	0.0	0.2
Gambusia holbrooki*	Mosquitofish	8.2	10.7	7.7	1.1	7.2
Poecilia latipinna*	Sailfin Molly	3.6	9.1	8.8	3.7	6.7
CYPRINIFORMES						
Cyprinidae	Minnows					
Notropis sp	Shiner	0.0	0.0	0.0	0.0	0.0
Catostomidae	Suckers					
Erimyzon sucetta	Lake Chubsucker	0.0	0.0	0.0	0.0	0.0
GASTEROSTEIFORMES						
Syngnathidae	Pipefishes					
Syngnathus louisianae	Chain Pipefish	0.0	0.0	0.0	0.0	0.0
PERCIFORMES						
Gerreidae*	Mojarras	0.0	0.3	0.1	3.4	0.8
Gobiidae	Gobies					
Gobiosoma bosc	Naked Goby	0.0	0.0	0.0	0.0	0.0
Gobiosoma robustum	Code Goby	0.0	0.1	0.0	0.0	<0.1
Lophogobius cyprinoides*	Crested Goby	1.1	0.0	0.0	0.0	0.2
Microgobius gulosus*	Clown Goby	6.1	0.2	0.0	4.9	2.4
Centrarchidae	Sunfish spp.	0.8	0.7	0.0	0.0	0.4
Elassoma evergladei	Pygmy Sunfish	0.0	0.0	0.0	0.0	0.0

Enneacanthus gloriosus	Blue Spotted Sunfish	0.1	0.0	0.0	0.0	<0.1
Lepomis marginatus	Dollar Sunfish	0.5	0.0	0.0	0.0	0.1
Lepomis punctatus	Spotted Sunfish	0.1	0.8	0.0	0.0	0.2
Lepomis microlophus	Redear Sunfish	0.0	0.0	0.0	0.0	0.0
Micropterus salmoides	Largemouth Bass	0.0	0.0	0.0	0.0	0.0
Cichlidae	Cichlids					
Cichlasoma bimaculatum	Black Acara	0.0	0.0	0.0	0.0	0.0
C. urophthalmus*	Mayan Cichlid	28.6	13.0	4.6	0.5	11.2
Tilapia mariae*	Spotted Tilapia	3.6	0.7	0.0	0.0	1.0
PLEURONECTIFORMES						
Soleidae	Soles					
Trinectes maculatus	Hogchoker	0.0	0.0	0.0	0.0	0.0
Totals		1774	1986	2651	1609	8020
Number Of Species		19	18	12	14	26
Number Of Nets Sampled		47	43	43	40	173
Number Of Dates Sampled		8	8	8	8	32

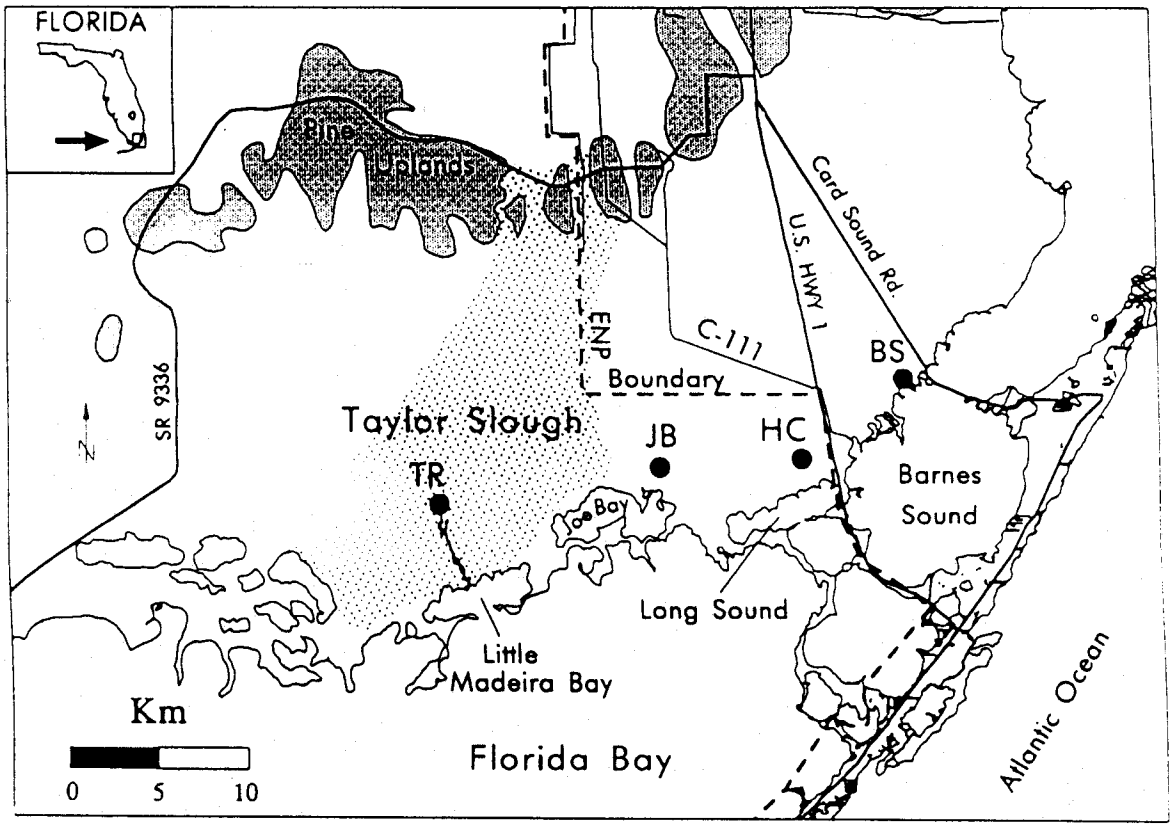


Figure G.1. Map of southern Florida indicating the four mangrove zone collection sites, Taylor Slough, C-111 canal, U.S. Highway 1, and Card Sound Road.

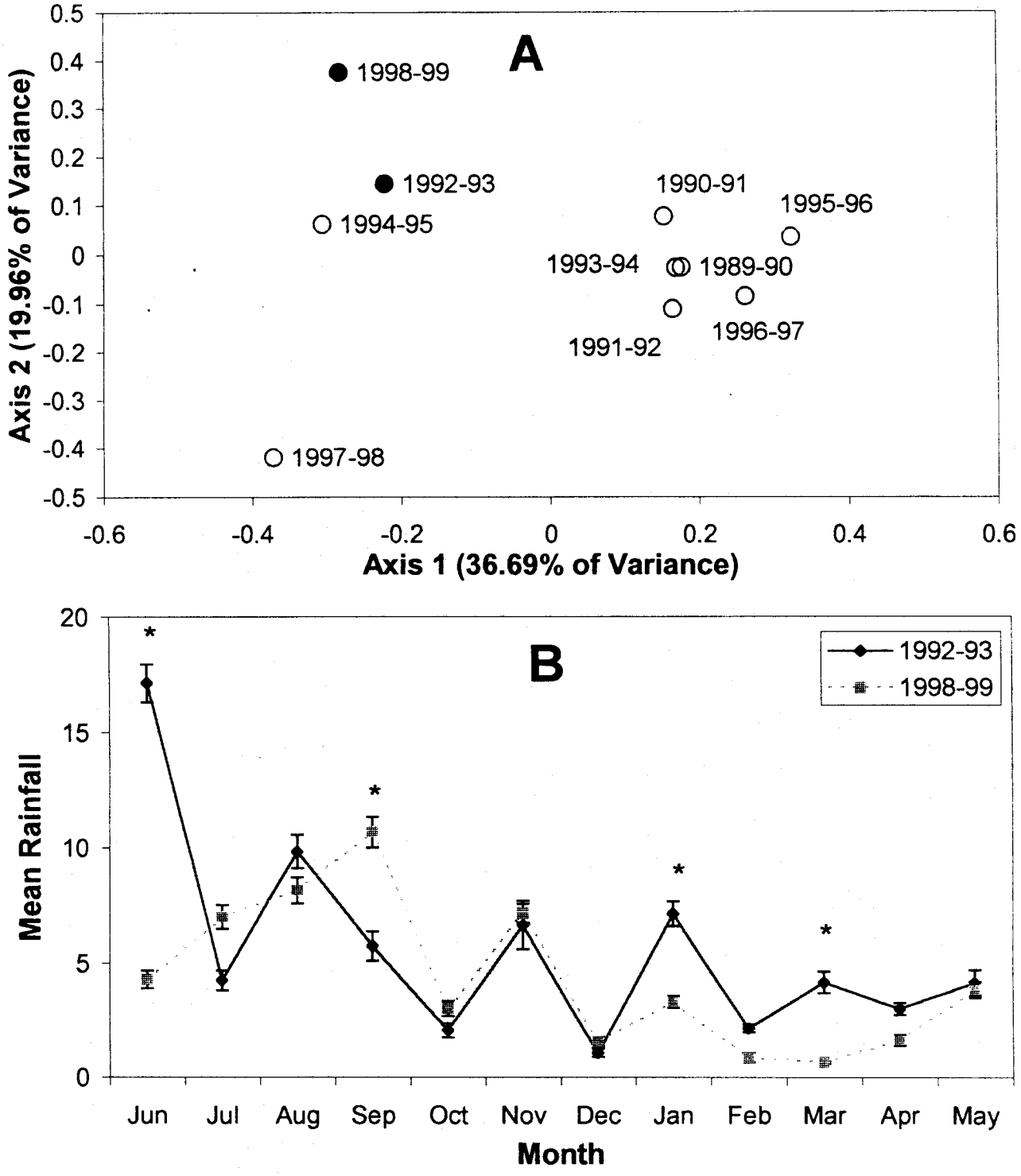


Figure G.2. Analysis of rainfall from 26 NOAA collection sites. A. Plot of ordination scores from Correspondence Analysis of monthly spatial variation for years since data collection began. The CA identified 1992-93 as the year most similar to the subject year (1998-99) B. Monthly mean rainfall (± standard error) for 1992-93 and 1998-99. An asterisk (*) indicates significant ($p<0.01$) differences between years.

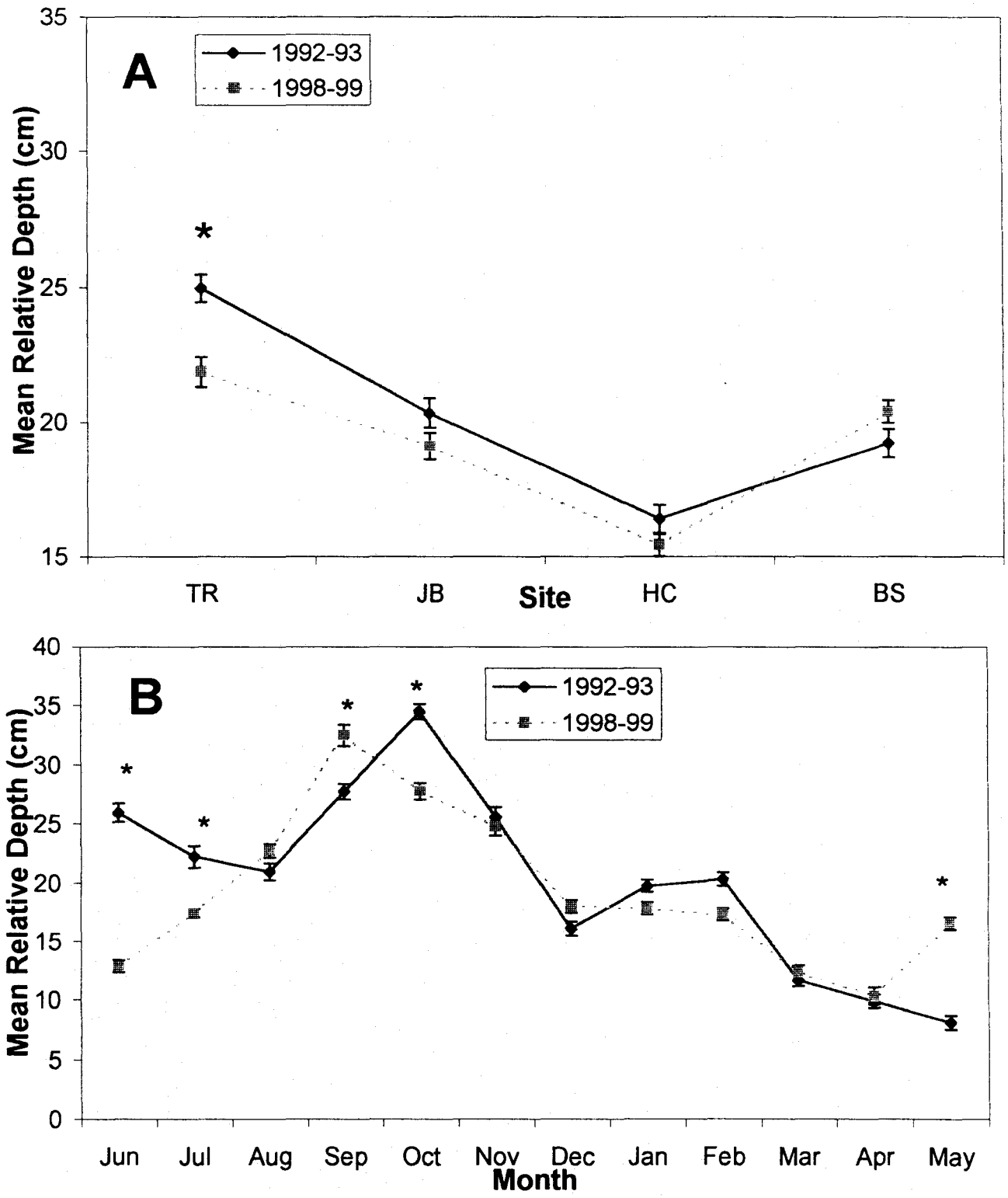


Figure G.3. Comparison of mangrove zone mean relative depth (cm) between 1992-93 and 1998-99 A) Mean (±SE) annual depth at four mangrove sites. B) Mean (+SE) monthly depth for all sites combined. Asterisk (*) indicates significant ($p<0.01$) differences between years.

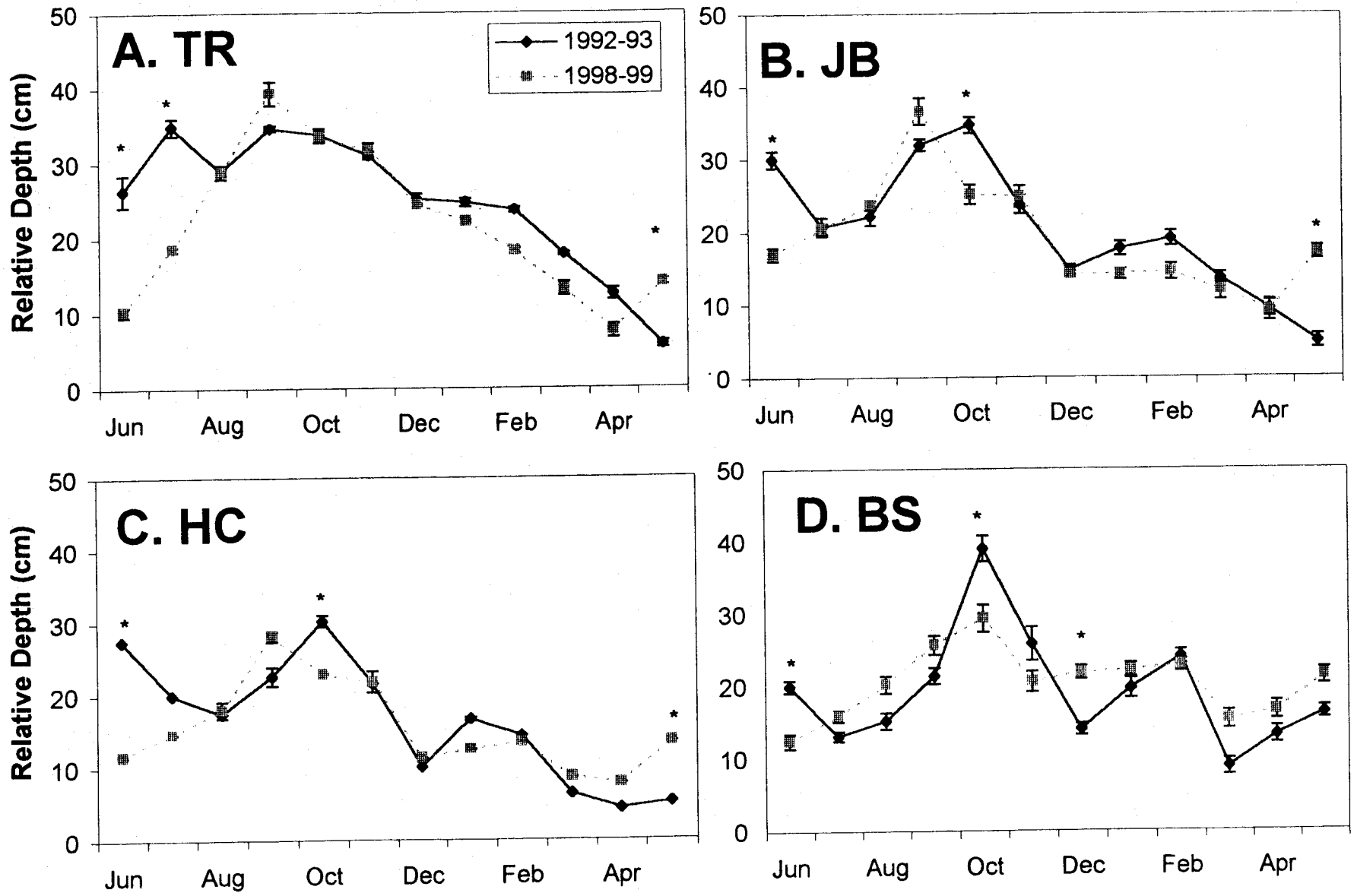


Figure G.4. Comparison of mean (±SE) relative depth between 1992-93 and 1998-99 for each collection site. Depth is cm of water above the level of the mangrove flats. The flats begin to dry at 5 cm and are completely dry at 0 cm. Below 0 cm the only water is located in the central creek habitat. An asterisk(*) indicates significant ($p<0.01$) differences between years.

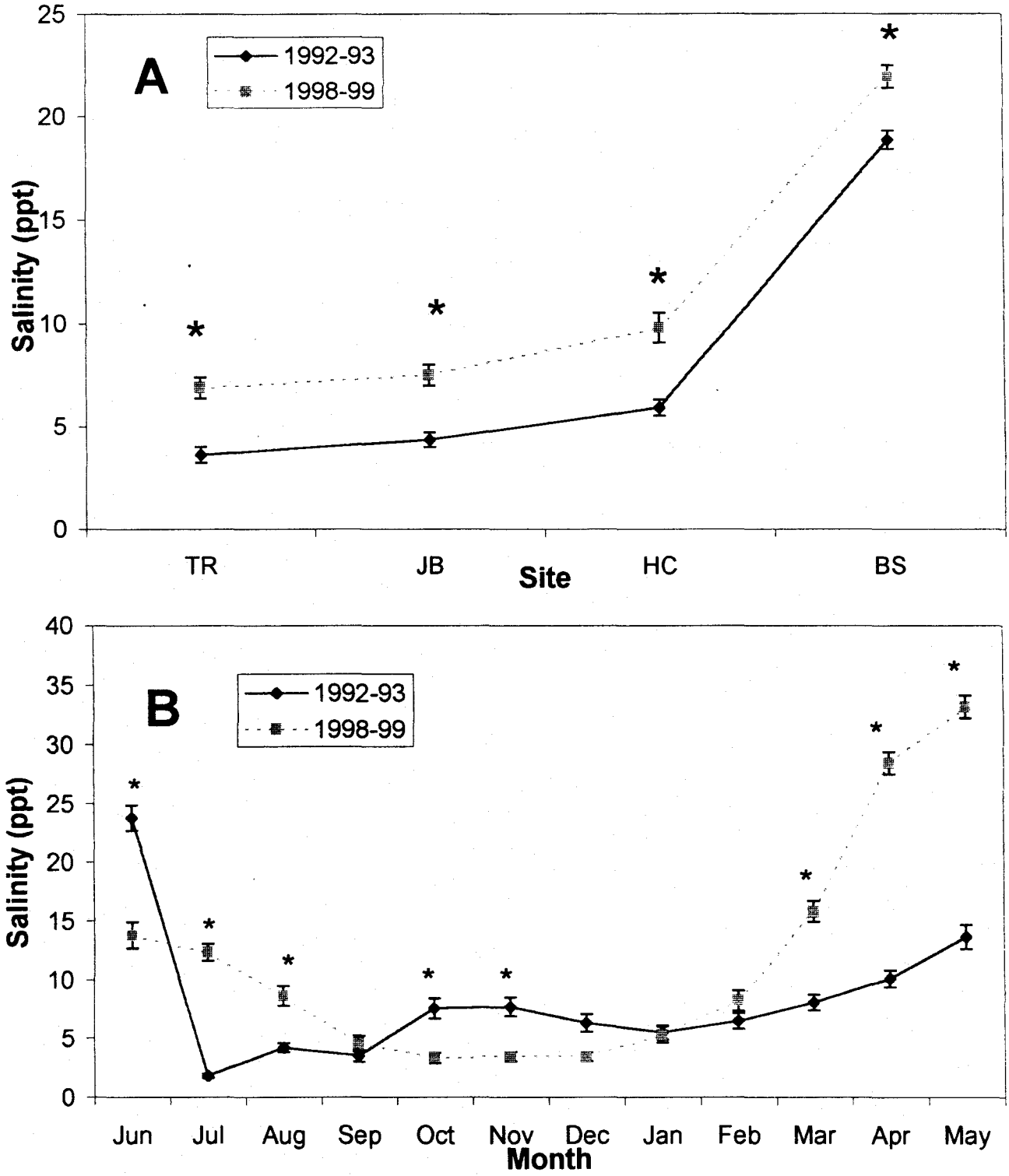


Figure G.5. Comparison of mangrove zone salinity (in parts per thousand) between 1992-93 and 1998-99. A) Mean (±SE) annual salinity at four mangrove sites. B) Mean (+SE) monthly salinity for all sites combined. Asterisk (*) indicates significant ($p<0.01$) differences between years.

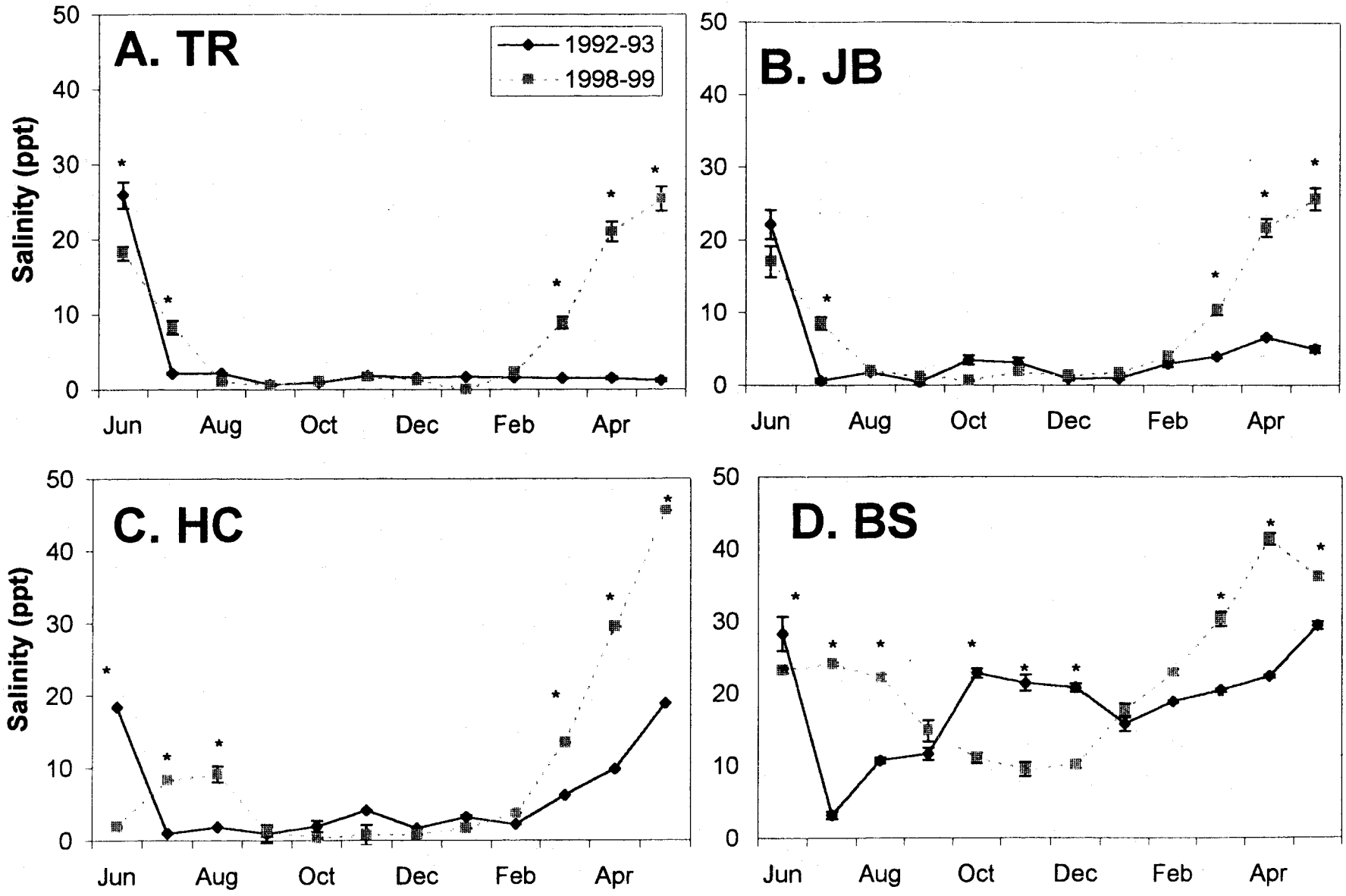


Figure G.6. Comparison of mean (±SE) monthly salinity (parts per thousand) between 1992-93 and 1998-99 for each mangrove zone collection site. An asterisk (*) indicates significant ($p<0.01$) differences between years.

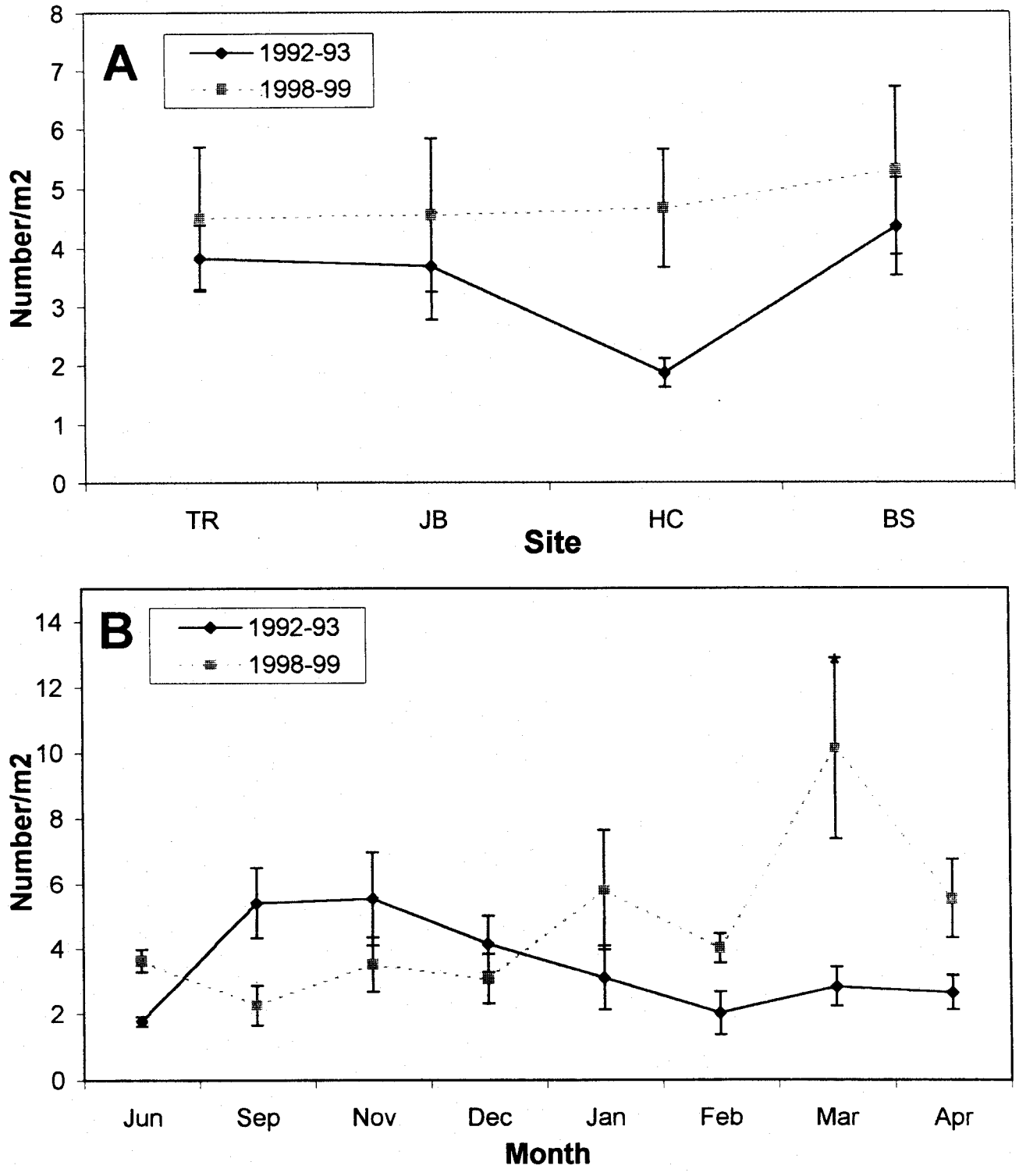


Figure G.7. Mean (±SE) stratified density per m^2 (± standard error) for the 1992-93 and 1998-99 collection years. A) Number of fish by site. B) Number of fish by month. An asterisk (*) indicates significant ($p<0.01$) differences between years.

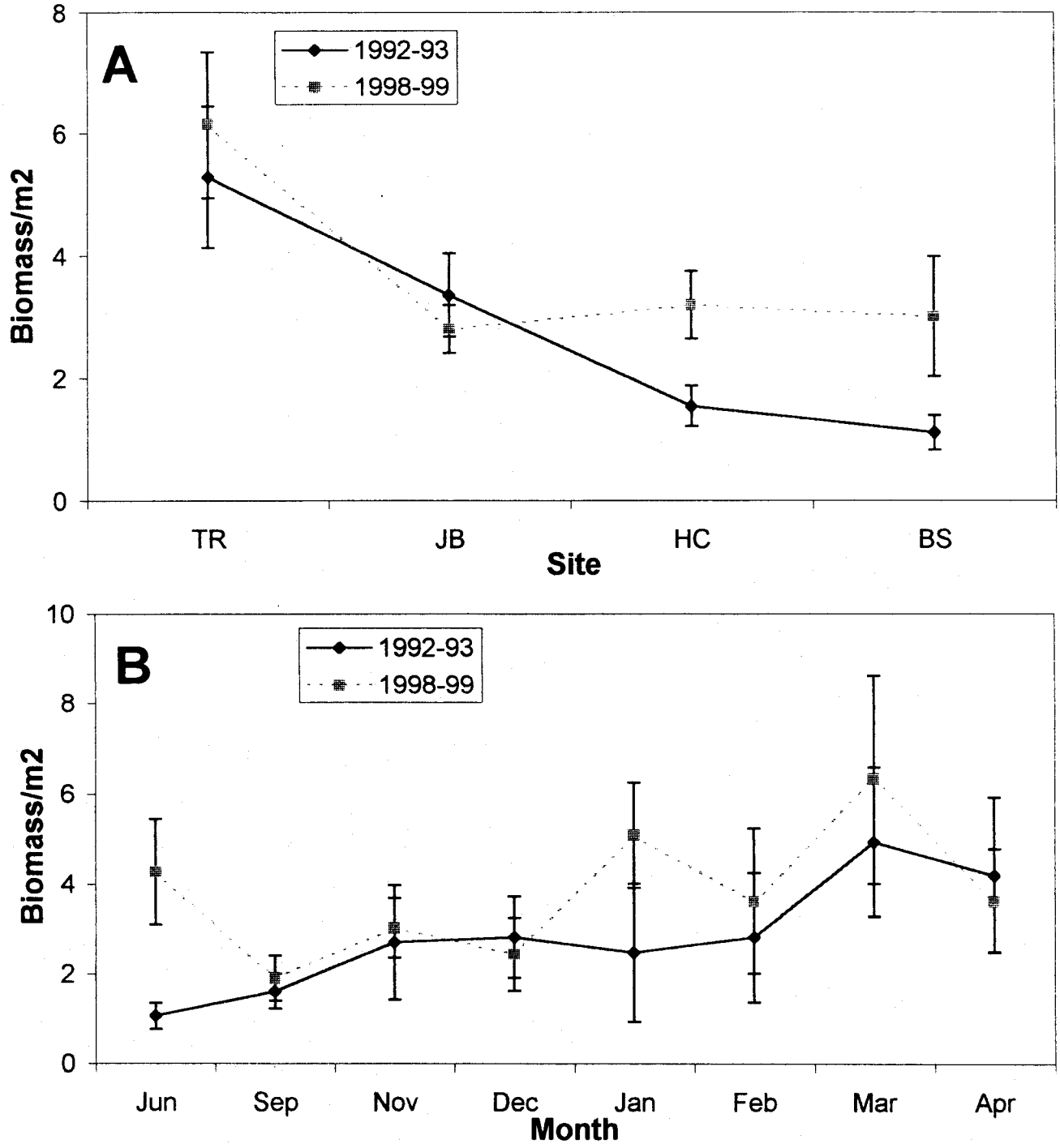


Figure G.8. Mean (±SE) stratified biomass (g) per m^2 (± standard error) for the 1992-93 and 1998-99 collection years. A) Biomass by site. B) Biomass by month. There were no significant difference between years for either interaction tested.

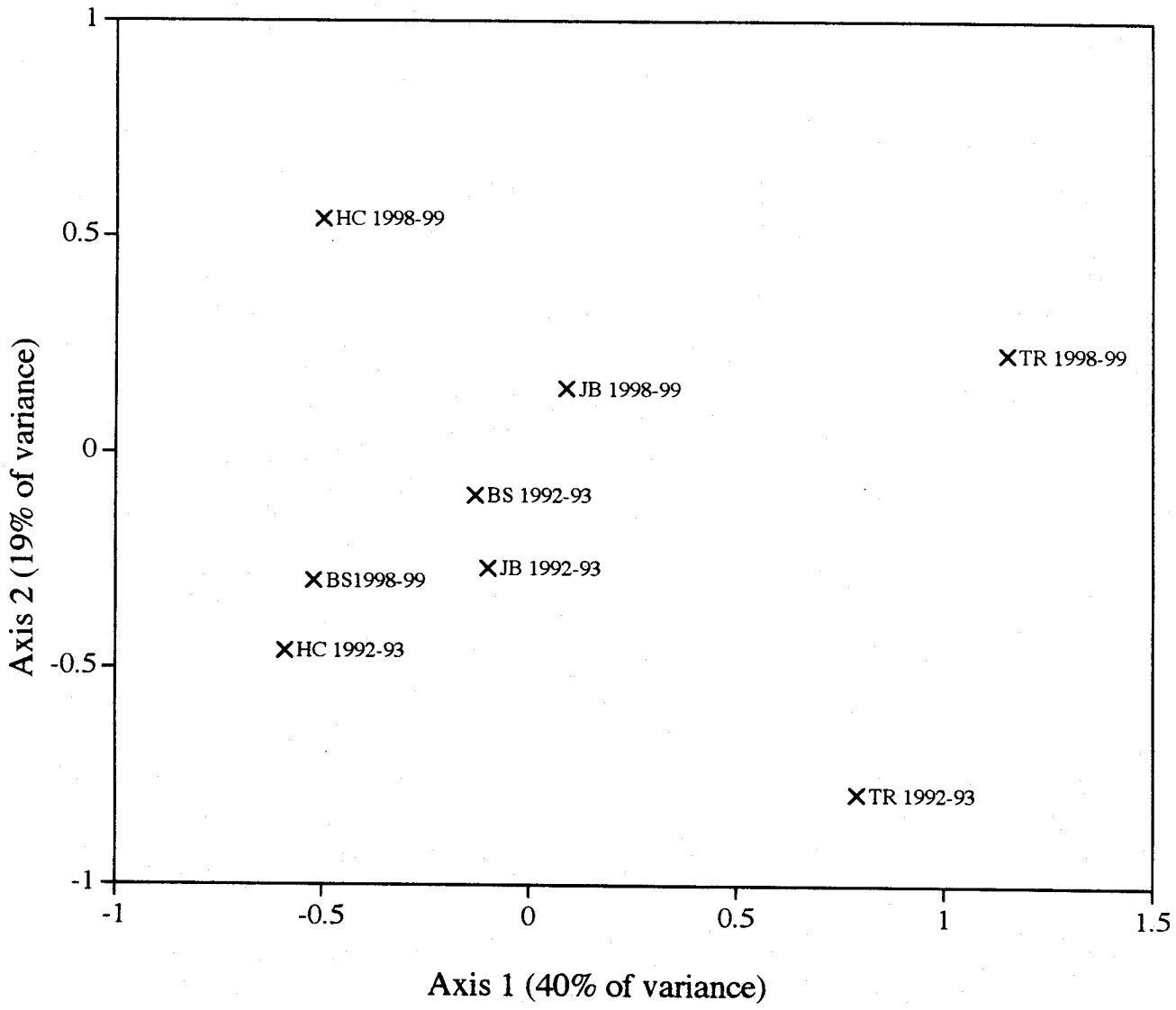


Figure 9. Plot of ordination scores from community structure correspondance analysis

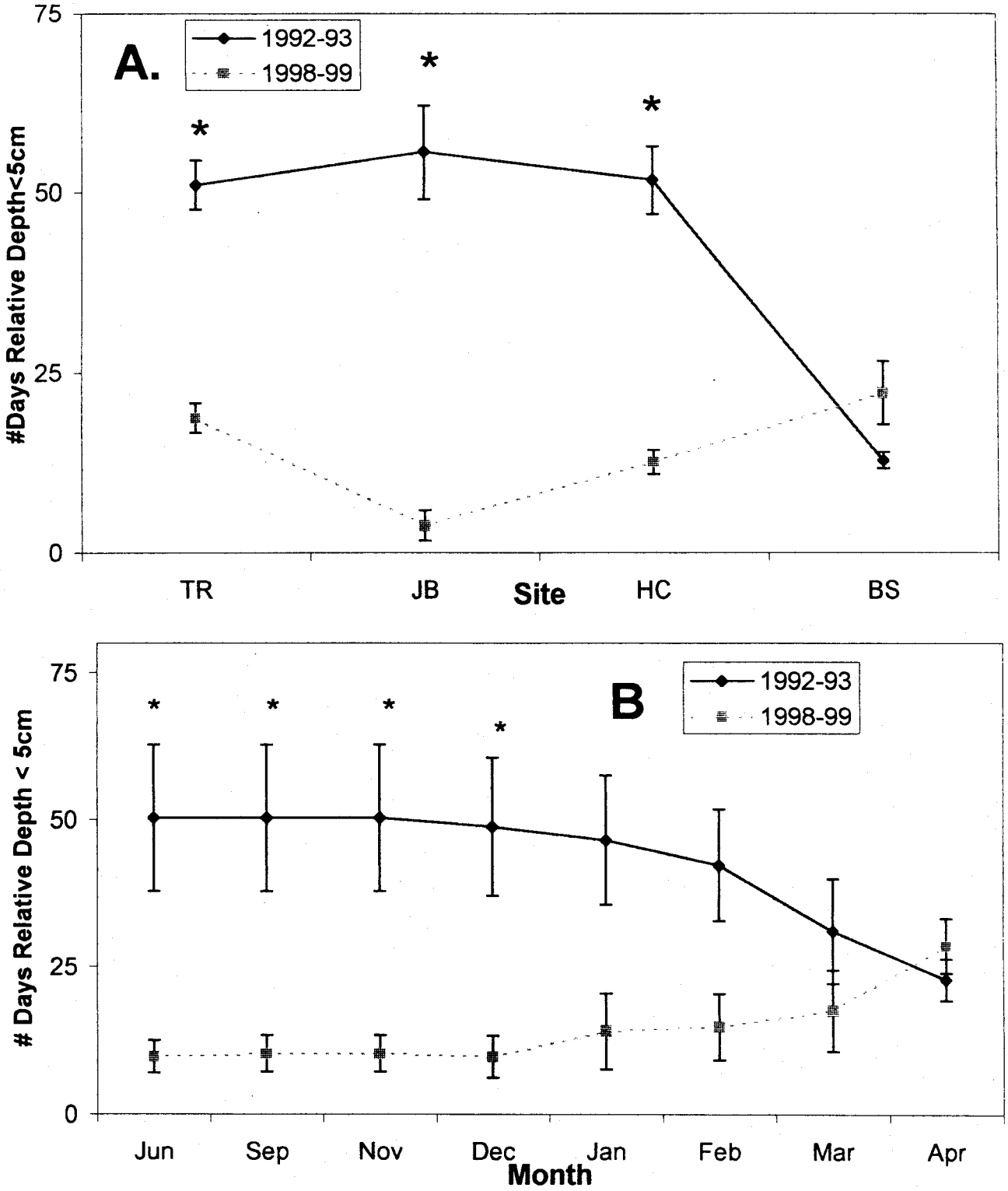


Figure G.10. A comparison of the Dryness Index (DI) between 1992-93 and 1998-99. The Y-axis indicates the number of days that relative depth was less than 5 cm for the year prior to fish sample collections. A) Mean (±SE) annual DI at four mangrove sites. B) Mean (+SE) monthly DI combined across the four sites. Asterisk (*) indicates significant ($p<0.01$) differences between years.

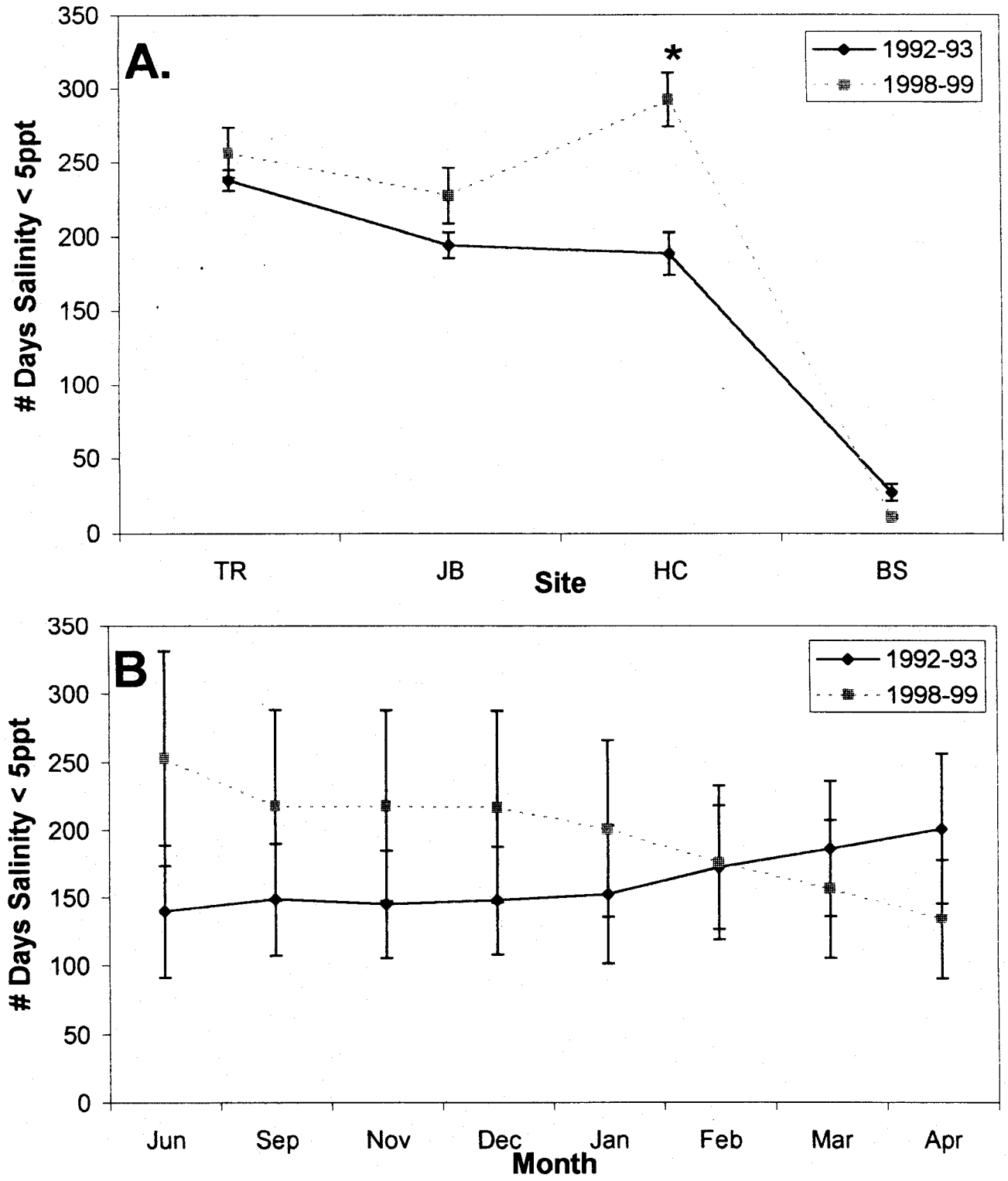


Figure G.11. A comparison of the Low Salinity Index (LSI) between 1992-93 and 1998-99. The Y-axis indicates the number of days that salinity was less than 5 ppt for the year prior to fish sample collections. A) Mean (±SE) annual LSI at four mangrove sites. B) Mean (+SE) monthly LSI combined across the four sites. Asterisk (*) indicates significant ($p<0.01$) differences between years.

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Lorenz, J.J., J.C. Ogden, R.D. Bjork, and G.V.N. Powell. In Review. Nesting patterns of Roseate Spoonbills (Ajaia ajaja) in Florida Bay 1935-1999: implications of landscape scale anthropogenic impacts. In J. Porter and K. Porter (eds). Linkages between ecosystems in the south Florida hydroscape. St Lucie Press.

Appendix H. Nesting patterns of Roseate Spoon bills (Ajaia ajaja) in Florida Bay 1935-1999: implications of landscape scale anthropogenic impacts

Jerome. J. Lorenz, John C. Ogden, Robin D. Bjork, George V.N. Powell

ABSTRACT

Roseate Spoonbills are listed as a species of special concern in the State of Florida and ninety percent of the states' breeding population nests on mangrove islands in Florida Bay. We analyze 65 years of nesting data in conjunction with foraging information to determine the response of spoonbills to anthropogenic disturbances. Since 1950, spoonbills have nested on 30 keys of Florida Bay. Nesting effort through time at any given colony was initially low for the first year(s) followed by a period of increase, a peak of variable duration in nest numbers, followed by a period of decrease to some lower level. This temporal pattern in nesting effort at a given colony can loosely be described as bell-shaped. Colonies in close spatial proximity tend to follow the same approximate temporal sequence in nesting effort resulting in a similar bell-shaped pattern when colonies are combined into groups based on foraging location. This may indicate that the observed pattern is a result of regional changes in food availability.

In his landmark work on Roseate Spoonbills, Allen (1942) identified four factors that could potentially explain the observed pattern. (1) Parasites and disease may impact nesting success and result in colony abandonment; (2) Disruption of nesting by raccoon invasion and subsequent nest predation may disband a colony; (3) Direct human disturbance (hunting and general colony disruption) may result in colony abandonment; (4) Availability and quality of food resources for a colony may change through time resulting in variable habitat usage by the colony. Each of these was evaluated and the preponderance of scientific evidence indicated that the availability and quality of food

to nesting activity, direct human disturbance of Florida Bay colonies has been temporally and spatially isolated and is not likely to have played major a role in the observed bell-shaped pattern in nesting distribution through time.

Allen (1942), suggested that even mild human disturbance at any time in the nesting cycle could lead to failure of the colony indicating that the collection of scientific data itself could alter nesting patterns. However, a study of nesting Roseate Spoonbills in Texas (White et al. 1982) found high reproductive success and no significant difference in success between colonies visited weekly throughout the nesting period and one which was visited only twice. There was no evidence that the presence of researchers in spoonbill colonies negatively affected spoonbill nesting. For example, reproduction at Sandy Key was close to 100% in 3 of the 5 years that intensive observations were being made there (1988-1992). Activities during this period included monitoring nesting success at 4- to 6-day intervals and radio-tagging juveniles. Nest success was 88% at Tern Key during the 1990-91 nesting period, even though these colonies were revisited at 4- to 6-day intervals to monitor nests and tag adult and nestlings. Finally, nest counts at many colonies that followed the bell-shaped temporal pattern were made only after fledging occurred. These observations indicate that visits by researchers do not explain the temporal pattern in nesting.

Raccoons

After discovering evidence of raccoon predation and subsequent abandonment of the Manatee Key colony in 1940, Allen (1942) formulated a hypothesis that the natural limiting factor determining colony location and nest success in Florida Bay was nest predation by raccoon (Procyon lotor). Raccoons have been implicated as efficient nest predators in various studies (Lapinot 1951, Frederick and Collopy 1989b). By surveying various bay keys for raccoon habitation, Allen concluded that raccoons had little difficulty in moving along the banks from the mainland to the keys and from one key to another. Keys in contact with a raccoon source (e.g., the mainland or the mainline Florida Keys) via a mud bank were most likely to have raccoons while those more distant along a bank were less likely to have raccoons. Isolated keys (i.e., those not connected by banks) tended not to have raccoons.



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In his landmark work on Roseate Spoonbills, Allen (1942) identified four factors that could potentially explain the observed pattern. (1) Parasites and disease may impact nesting success and result in colony abandonment; (2) Disruption of nesting by raccoon invasion and subsequent nest predation may disband a colony; (3) Direct human disturbance (hunting and general colony disruption) may result in colony abandonment; (4) Availability and quality of food resources for a colony may change through time resulting in variable habitat usage by the colony. Each of these was evaluated and the preponderance of scientific evidence indicated that the availability and quality of food

resources have been altered by land and water management practices in and around the Florida Bay landscape.

The major anthropogenic perturbations to spoonbill foraging grounds have been the filling of wetlands for urban development in the upper Florida Keys and the alteration of wetland type and function along the northeast coast of Florida Bay by water management practices. In each of the sub-regions, environmental conditions initially favored nesting and effort increased over time to some sustainable level. At varying intervals, the foraging grounds in each sub-region were anthropogenically altered and spoonbill nesting effort and nest success waned at the colonies within the impacted sub-region, thereby explaining the observed bell-shaped curve in nesting effort through time. Nesting Roseate Spoonbills exhibited a measurable response to water management practices in the southeastern Everglades.

INTRODUCTION

Florida Bay is a subtropical estuary that lies between the tip of the south Florida mainland and the Florida Keys (Figure H.1). The bay is dependent on freshwater runoff from adjacent uplands that mixes with marine water from the Atlantic Ocean and the Gulf of Mexico to produce conditions that historically supported a highly productive estuarine ecosystem. South Florida's unique ecosystems face increasing pressures from a rapidly expanding human population. The ecological decline of Florida Bay exemplifies this pressure (Van Lent et al. 1993; Fourqurean and Robblee 1999). Increasingly, attention is being focused on the problems of the Bay and what can be done to ameliorate them.

Historically, fresh water entered the Florida Bay estuary from the Everglades via Taylor Slough and numerous associated creeks to the east (Figure H.1). However, drainage of the Everglades for urban and agricultural uses and flood-control measures substantially reduced much of this freshwater source (Fourqurean and Robblee 1999). Prior to the mid-1960's, water-management efforts were focused primarily in the northern and central parts of the Everglades (Light and Dineen 1994). Although these early activities altered hydropatterns in the southeastern part of the Everglades (Van Lent et al. 1993), the impact on direct fresh water inflows to Florida Bay was relatively small (Johnson and Fennema 1989).

Beginning in 1964, flow patterns toward Florida Bay were significantly altered by the construction and operation of canals in the extreme southeastern Everglades basin (Johnson and Fennema 1989). Concerns about the environmental impacts of this canal system on Everglades National Park (ENP) resulted in the United States Congress authorizing the South Dade Conveyance System (SDCS) in 1968 (Light and Dineen 1994). The SDCS was designed to provide Taylor Slough with a predictable freshwater supply from upstream components of the Everglades system via an array of pumps and canals added to the existing canals in the C-111 basin (Light and Dineen 1994). In 1970, Congress also legislated the implementation of the Minimum Schedule of Water Deliveries to ENP which dictated that the canal system be operated such that Shark River Slough, Taylor Slough and the southeastern basin receive a pre-determined minimum amount of fresh water per year (Light and Dineen 1994). It was believed that the SDCS and the Minimum Schedule would provide Florida Bay with an adequate supply of fresh water; however, the SDCS was not completed until June 1982 (Van Lent et al. 1993), and, as a result, the Minimum Schedule was never fully implemented (Johnson and Fennema 1989; Van Lent et al. 1993; Light and Dineen 1994). During the dry season of 1983, unseasonably heavy rains resulted in emergency regulatory water releases into ENP which resulted in ecologically undesirable conditions (Light and Dineen 1994). In March 1983, an environmental emergency was declared and the Minimum Schedule of Water Deliveries was suspended (Light and Dineen 1994). In 1984 the Minimum Schedule was officially terminated by congress. Johnson and Fennema (1989) showed that between 1970 and 1982, water levels in Taylor Slough were lower than in prior years and, consequently, less water was reaching Florida Bay. Their findings indicated that the Minimum Schedule failed in its design to provide Florida Bay with an adequate water supply.

Beginning with the March 1983 emergency actions, the recently completed SDCS was used to implement a new schedule for canal operations (Light and Dineen 1994), ultimately called the Experimental Program of Water Deliveries (the Experimental Program did not officially begin until 1984, when congress ended the Minimum Schedule; USACOE 1995). Although designed to deliver an adequate water supply to Taylor Slough and Florida Bay, the SDCS was primarily used for flood-control measures

under the Experimental Program of Water Deliveries (Johnson and Fennema 1989). Johnson and Fennema (1989) compared hydrologic conditions from 1982-1988 to conditions from 1956-1964 and found that water levels in the Taylor Slough headwaters were lowered by an estimated 45 to 60 cm as a result of the operation of SDCS under the Experimental Program. Van Lent et al. (1993) indicated that operation of the SDCS under the Experimental Program resulted in significant water loss from the system through groundwater seepage. These conditions ultimately resulted in further lowering water levels throughout eastern ENP (Van Lent et al. 1993) with even less fresh water reaching Florida Bay than during Minimum Schedule of Water Deliveries period (Johnson and Fennema 1989). The Experimental Program went through several iterations (called "tests") but continued as the operational schedule through the spring of 1999 (USACOE 1995).

Hydrologic models indicate that the amount of water flowing through the Everglades toward Florida Bay has been greatly reduced compared to historic flows (Fennema et al. 1994). McIvor et al. (1994) developed a model of historic salinities for the euryhaline area between the freshwater Everglades and saltwater Florida Bay. The model indicated that marine conditions have occurred more frequently and that brackish and marine periods have been longer in duration as a result of water management practices of the last several decades. Meeder et al. (1996) used paleo-ecological techniques to demonstrate that the marine environment had intruded into the historically freshwater wetlands north of Florida Bay at a rate faster than could be accounted for by sea-level rise. They also showed that changes in the rate of marine intrusion were correlated with the construction and changes in operation of the SDCS. Ross et al. (in press) performed vegetation surveys between the C-111 canal and Florida Bay and compared the results to similar surveys of the same area performed by Egler in 1948 (Egler 1952). The comparisons indicated that the mangrove-dominated area has expanded inland by as much as 3.3 km since the 1948 study, supplanting historic freshwater sawgrass marshes. Cumulatively, these studies indicate that the wetlands north of Florida Bay have experienced higher salinities, longer periods of saline intrusion, and shorter hydroperiods due to anthropogenic manipulation of water resources than would have occurred in a non-managed system. Many researchers have concluded that

the reduction in freshwater flow from the Everglades was at least partially responsible for recent ecological changes in the Florida Bay ecosystem (Boesch et al. 1993; Fourqurean and Robblee 1999).

Florida Bay's problems are not limited to the diversion of fresh water. The construction of roadbeds between the Florida Keys has reduced connectivity between the estuary and the marine environment (Hudson et al. 1989). Furthermore, urban and agricultural pollutants from both mainland and Keys sources may be contributing factors in the recent ecological degradation of Florida Bay (Lapointe and Clark 1992; Lapointe and Matzie 1996). Between 1940 and 1990, the number of people residing in the Florida Keys increased from 14,000 to 78,000 (Lott et al. 1996). This more than five-fold increase in population was also accompanied by a boom in the tourism industry. An estimated 1.9 million people visited the Keys in 1990, with an average of more than 35,000 visitors staying in the Keys on a daily basis (Lott et al. 1996). Between 1955 and 1972, the desire for water-front housing resulted in large scale dredge-and-fill projects which converted mangrove wetlands into canal-lined subdivisions with easy ocean or bay access (Lott et al. 1996). Between Lake Surprise on Key Largo and the southern end of Lower Matecumbe Key, an estimated 39.2% of the original mangrove wetlands were filled during this period (Strong and Bancroft 1994). Lower Matecumbe Key, Plantation Key and Southern Key Largo were most severely impacted by urban development with wetland losses of 65.3%, 49.8% and 43.8% respectively (Strong and Bancroft 1994). The impact of the Keys' human population on the Florida Bay ecosystem is a controversial issue (Lott et al. 1996), and is the subject of a large-scale multi-agency planning process (Keys Carrying Capacity Study). However, the impact of the loss of wetland habitat on animal populations has largely been overlooked.

Federal, state, and local authorities are currently involved in the process of redesigning the human-controlled features of the southern Florida landscape, to a large extent aimed at reversing the ecological degradation of Florida Bay. So that restoration will be an iterative process, indicator species will be selected to evaluate the progress of these redesign activities. Roseate Spoonbills (Ajaia ajaja) have been selected as a potential indicator species for the Florida Bay ecosystem. However, little information about the responses of spoonbills to anthropogenic perturbations in southern Florida has

been published. This manuscript presents spoonbill nesting data collected since 1935 and examines spoonbill responses to various impacts to the system over the last 65 years. The conclusions drawn are used to develop potential responses of spoonbills to future restoration efforts.

REVIEW

Roseate Spoonbills feed by tactolocation (Allen 1942; Dumas in press). While feeding, a spoonbill swing its head so that the partially-open bill is swept through the water in a semi-circular motion. This action is performed while walking forward, giving the feeding spoonbill a somewhat inebriated appearance while feeding. When the highly sensitive 'spoon' encounters a prey item, the bill snaps shut (Allen 1942). With little cessation in forward progress, the spoonbill tosses the prey to the back of the throat by suddenly jerking the head backward out of the water.

This highly specialized feeding behavior requires that Roseate Spoonbills forage in extremely shallow environments (less than 20 cm; Powell 1987). It also allows them to take advantage of an abundant food source in the form of small demersal fishes and crustaceans found in coastal wetlands (Allen 1942). A variety of prey items have been described from spoonbill dietary investigations, however, small fishes of the orders Cyprinodontidae and Poeciliidae appear to be the primary dietary items (Allen 1942; Dumas in press). Sheepshead minnow (Cyprinodon variegatus) and sailfin molly (Poecilia latipinna) were found in virtually every analysis of spoonbill diet reviewed by Dumas (In press). Crop samples from 25 nestlings from two colonies in different parts of Florida Bay contained 85-90% small fish (primarily Cyprinodontidae and Poeciliidae) with the remainder being mostly shrimp of the genus Palaemonetes (Powell and Bjork 1990).

Like many wading bird species, spoonbills appear to depend on the wet/dry seasonal cycle of southern Florida to successfully reproduce (Kushlan 1978; Frederick and Collopy 1989a; Bjork and Powell 1994). During the wet season, the prey base exploits vast, seasonally inundated wetlands, thereby increasing in number and biomass (Kushlan 1978; Loftus and Eklund 1994; DeAngelis et al 1997; Chapter 6). Chapter 3 indicated that high freshwater flows toward the coastal wetlands of Florida Bay may

promote high secondary production as well. During the dry season, the abundant prey organisms are concentrated in the drying wetlands or are forced into the remaining pools, creeks and sloughs (Kushlan 1978; Loftus and Kushlan 1987; Loftus and Eklund 1994; DeAngelis et al. 1997; Chapter 6). Spoonbill breeding in Florida Bay is timed with seasonally low-water depths (Allen 1942; Bjork and Powell 1994), presumably because the adults depend on this concentration effect to capture enough food to raise young (Allen 1942; Frederick and Collopy 1989a; Bjork and Powell 1994; Bjork and Powell 1996; Dumas in press). Gradual and consistent declining water levels throughout the nesting cycle may be critical for successful nesting in spoonbills (Bjork and Powell 1996). Evidence of high reproductive success during breeding seasons with gradual dry downs and poor reproduction during seasons of a reversed drying trend on the foraging grounds supports this hypothesis (Bjork and Powell 1994). Therefore, ideal conditions for nesting spoonbills would result from high water levels in the headwaters during the wet season and low water levels in the coastal habitats during the dry season. Because of their highly specialized foraging behavior, spoonbills may be more sensitive to disruptions in the wet/dry cycle than other predatory species dependent on Florida Bay's coastal wetlands.

Ninety percent of the Roseate Spoonbills breeding in Florida nest on mangrove islands in Florida Bay within the boundaries of Everglades National Park (ENP) (Bjork and Powell 1996). At present, they are a Species of Special Concern in Florida (Wood 1997). Historical accounts from the 1800's indicate that a large population of Roseate Spoonbills once existed in the state, including a large presence in Florida Bay (summarized in Allen 1942 and Powell et al. 1989). During the last half of the 1800s, and continuing through the early 1900s, the Roseate Spoonbill population was greatly reduced by direct human disturbance. During this period, plume hunting was a highly lucrative profession in southern Florida (Graham 1990) and spoonbills were heavily affected (Allen 1942). Spoonbills may have been targeted by plume, subsistence and sport hunters or may have been incidentally impacted by these activities (Allen 1942; Graham 1990). Regardless of intention, hunting practices had greatly reduced spoonbill numbers by the time prohibition of plume hunting and protection of nesting colonies began in the early 1900s. Illegal sport and subsistence hunting probably continued the

decline, and, by the early 1930s, fewer than 200 pairs were thought to nest in Florida (Allen 1942). By 1935, continued human depredation on adults and eggs had probably eliminated all colonies except the Bottle Key colony which had been reduced to 15 pairs (Allen 1963). By 1941, it was thought to be the only remaining active colony in Florida (Allen 1942). After 1940 no spoonbill counts were made until Allen resumed his Florida Bay surveys in 1950. At that time he found larger numbers of nesting birds and a greater number of active colonies compared to his surveys in the 1930s (Allen 1963).

Powell et al. (1989) recounted the history of Roseate Spoonbill nesting in Florida Bay from 1935 to 1989. Table H.1 and Figure H.2 summarizes their findings. Approximately every 10 years from 1955 through 1978, the nesting population doubled (Figure H.2). In the 1978-79 season there was a dramatic increase in the number of breeding spoonbills over the previous two years, with the population exceeding 1200 breeding pairs (Figure H.2). No information is available for the five years subsequent to 1978-79, but by 1984 (when population surveys were re-initiated) the nesting population had declined to about 400 nests. With the exception of 1978-79 peak, spoonbill nesting effort in Florida Bay was approximately 400 to 800 nests (Figure H.2) in about 15 to 20 colonies (Table H.1) in all years surveyed since 1975-76 (Figure H.2).

A general temporal pattern in nesting effort was observed at most colonies. Nest numbers were initially low for the first year(s), followed by a period of increase, a peak of variable duration, and finally by a period of decrease (Table H.1; Powell et al. 1989). This 'boom and bust' temporal sequence in nesting effort can loosely be described as a bell-shaped pattern. The record at Cowpens, Tern, and Porjoe Keys are good examples of the roughly bell-shaped pattern observed at many colonies through time (Figure H.3). Several of the more recently initiated colonies presumably are at various stages within this pattern. For example, nesting at Sandy Key appears to be in a stabilized peak period (Figure H.3) and may decline at some future time.

Colonies in close spatial proximity tend to follow the same approximate temporal sequence in nesting effort resulting in a similar bell-shaped pattern when colonies are combined on a regional scale (Figure H.2). This trend may indicate that the observed pattern is a result of environmental fluctuations on a smaller than bay-wide scale. The hypothesis to be investigated is that, initially, environmental conditions favor nesting, and

effort presumably increases to some level. On varying time scales, conditions apparently change and the colonies within a given region of the bay decline. The pattern may also be repeating itself on a bay-wide scale (with current conditions at a stable peak stage or in the early stages of decline), which may give reason for concern. Understanding the driving mechanism(s) behind the observed patterns is critical if spoonbills are to be used as a gage by which the general condition of Florida Bay is measured and by which management and restoration decisions are made.

In his landmark work on Roseate Spoonbills, Allen (1942) identified a variety of factors that play a role in the selection and suitability of nesting sites. Some factors identified by Allen do not lend themselves to explaining the observed bell-shaped temporal pattern in nesting effort. These include suitable nesting site (semi-protected red mangroves are found on virtually every bay key), minimal tidal range (most of the nesting colonies are in areas that have minimal or no diurnal tide), reasonable water quality (water quality throughout the bay was fairly constant until the late 1980s and the pattern was observed prior to this change) and climatic factors (would be expected to act on a bay-wide scale and, therefore, would not likely impact colonies individually or on a regional scale). Allen (1942) also identified four factors that could potentially explain the observed pattern: (1) parasites and disease may impact nesting success and result in colony abandonment; (2) direct human disturbance (hunting and general colony disruption) may result in colony abandonment; (3) disruption of nesting by raccoon invasion and subsequent nest predation may disband a colony; and (4) availability and quality of food resources for a colony may change through time resulting in variable usage of the colony. The following sections review existing evidence that might support or refute these factors as explanations for the observed pattern in colony size through time.

Diseases, parasites and contaminants

In 1940, Allen (1942) found evidence of an ectoparasite infestation in a Roseate Spoonbill colony on the Texas coast. The colony was abandoned by adults and chick mortality soon followed. Allen (1942) proposed that the parasites weakened the nestlings so they could not perform the necessary begging behavior needed to elicit a feeding

response by parents. Bjork and Powell (1994) also indicated that disease and parasites were a source of nesting mortality in Florida Bay Roseate Spoonbill colonies between 1987 and 1992. M.G. Spalding (pers. comm.) performed necropsies on chicks in Florida Bay colonies between 1987 and 1992. Results indicated that viral, bacterial and endoparasitic infections were present and may have played a role in nestling mortality, however prevalences were low. M.G. Spalding (pers. comm.) also found high prevalences of ectoparasitic infestations, with some chicks having sufficient numbers to cause health problems.

These results indicate that disease and parasites could result in colony abandonment or lowered nesting success rates. It seems unlikely that such agents would persist from year to year within a colony, and, therefore, are unlikely to explain the declines observed in Florida Bay colonies over time. In the case of the 1940 Texas colony, Allen (1942) found no evidence of the ectoparasites within the colony the following year. The colony formed normally and successfully fledged young. Bjork and Powell (1994) indicated that disease and parasites did not appear to be a factor in either colony formation or overall colony nesting success, but rather the impacts appeared to be on the level of individual nests. M.G. Spalding (pers. comm.) indicated that disease-related mortality had a minor impact on the overall nesting success in Roseate Spoonbills. Furthermore, Allen (1942), Bjork and Powell (1994), and M.G. Spalding (pers. comm.) all indicated that other factors may have acted synergistically with the disease/parasitic agents in causing observed nest mortality.

M.G. Spalding (pers. comm.) also examined the effects of environmental contaminants on wading birds. Spoonbill eggshells, nestlings, and adults showed relatively low concentrations of organochloride compounds and there was little evidence supporting poisoning by organophosphates and carbamates. Sundlof et al. (1994) found mercury concentrations in tissues of some spoonbill nestlings at levels associated with emaciation, disease and weakness in other species; however, in this case, the condition was not directly implicated in nestling mortality. Interestingly, mercury concentrations were much higher in nestlings from colonies in the northeastern bay when compared to nestlings from the northwestern bay (Sundlof et al. 1994). These differences in mercury

concentrations are pertinent to observed differences in spoonbill nesting patterns between these regions of the bay (See Results and Discussion section).

In reference to tactile feeding wading birds, M.G. Spalding (pers. comm.) concluded that disease/contamination-related mortality was minor compared to nest abandonment caused by human disturbance, inclement weather and inadequate food resources. This conclusion is supported by observations of Florida Bay spoonbill nesting success between 1995 and 1999. During this period, success rates were extremely low and adults were observed to abandon colonies following inclement weather events (see also Bjork and Powell 1994). Dead chicks were collected and found to be emaciated (JJL pers. obs.). Live chicks in a weakened state were collected and found to be starving. Several of these birds recovered when fed a diet of frozen bait fish and were ultimately released to the wild (Laura Quinn; pers. comm.).

Direct human disturbance

According to Allen (1942), direct human disturbance (hunting and general colony disruption) resulted in the relocation of nesting effort. At the time of Allen's initial studies, spoonbill colonies remained largely unprotected and human transgressions were still a threat to the small population of spoonbills left in Florida Bay. However, in 1947, most of the spoonbill colonies were incorporated into ENP, and boat landings on colony islands were restricted. Since then, remarkably few incidents of humans disturbing spoonbill colonies in Florida Bay have been reported. Allen (1963) indicated that photographers caused the collapse of the Porjoe colony in 1953. However, the colony formed in subsequent years indicating that impact of direct human disturbance was short-lived. Bjork and Powell (1994) speculated that the decline at Porjoe Key between 1988 and 1990 was a result of human visitation to the island. The recovery in 1990 coincided with ENP posting a 30 m minimum approach distance around the island. Bjork and Powell (1994) also reported that, in 1991, someone had cut the mangroves into the East Buchanan colony and the cleared path was reportedly being used as a sight-seeing destination. The colony was abandoned at that time and ENP limited access to this site as well. When next surveyed in 1998-99, evidence of recent spoonbill nesting was found within the colony site, though there were no active nests that year. Although detrimental

to nesting activity, direct human disturbance of Florida Bay colonies has been temporally and spatially isolated and is not likely to have played major a role in the observed bell-shaped pattern in nesting distribution through time.

Allen (1942), suggested that even mild human disturbance at any time in the nesting cycle could lead to failure of the colony indicating that the collection of scientific data itself could alter nesting patterns. However, a study of nesting Roseate Spoonbills in Texas (White et al. 1982) found high reproductive success and no significant difference in success between colonies visited weekly throughout the nesting period and one which was visited only twice. There was no evidence that the presence of researchers in spoonbill colonies negatively affected spoonbill nesting. For example, reproduction at Sandy Key was close to 100% in 3 of the 5 years that intensive observations were being made there (1988-1992). Activities during this period included monitoring nesting success at 4- to 6-day intervals and radio-tagging juveniles. Nest success was 88% at Tern Key during the 1990-91 nesting period, even though these colonies were revisited at 4- to 6-day intervals to monitor nests and tag adult and nestlings. Finally, nest counts at many colonies that followed the bell-shaped temporal pattern were made only after fledging occurred. These observations indicate that visits by researchers do not explain the temporal pattern in nesting.

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In a study of White-Crowned Pigeon (Columba leucocephala) nesting patterns in Florida Bay, Strong et al. (1991) examined the distribution of potential nest predators on bay keys. Based on surveys conducted between 1987 and 1989, they found the raccoon distribution on Florida Bay to be nearly parapatric with nesting pigeons. The impact of other potential predators was found to be minimal. They concluded that presence of raccoons made potential nesting sites unsuitable. Furthermore, their data supported Allen's (1942) assessment that raccoons appear to migrate from island to island along the mud banks.

Figure H.4 shows that the distribution of raccoons in 1987-1989 (Strong et al. 1991) was parapatric with Roseate Spoonbill nesting colonies from 1935 to 1999. Strong et al. (unpubl. data) also assembled a list of bay keys reported to have had raccoon activity prior to and after the 1987-1989 survey (Figure H.4). Of the thirty spoonbill nesting colonies, only four were located on keys that had ever had reports of raccoons: Pass, East Bob Allen, Manatee and Cowpens keys. The complete spoonbill nesting record at Pass Key included only 8 nests over 3 consecutive years (Table H.1), suggesting that conditions at Pass Key were never ideal for spoonbill nesting. Although raccoons were observed on East Bob Allen Key in the 1970's, no signs of raccoons were observed during the 1987-1989 survey. The record of spoonbill nesting on this key began in 1986-87 (Table H.1), so it appears that spoonbill nesting and raccoon presence were not contemporaneous. Allen (1942) reported the disruption of the Manatee Key nesting colony by raccoons in 1940. Since then, nesting effort at Manatee has been sparse and intermittent (Table H.1). Cowpens Key had been the subject of intense scrutiny by National Audubon Society researchers between 1950 and 1980 because of a large mixed-species wading bird colony (R.P. Allen notes; A. Sprunt IV pers. comm.). In 1978, a single raccoon appeared on the island in late spring and was removed prior to the following nesting season (A. Sprunt IV pers. comm.). This is the only record of raccoon at Cowpens.

These observations support Allen's hypothesis that raccoon presence is a primary determinant in colony site selection by and nesting success of spoonbill. Most large colonies formed on isolated islands that were not connected to the mainland or the mainline keys by banks (e.g. Tern, Porjoe, Pigeon, Duck, Butternut keys, Nest keys and

Buchanan keys). Several large colonies were located along a bank but were isolated by the presence of deep channels that cut through the bank (e.g. Sandy, Frank, Cowpens, and Cotton Keys) thereby cutting off the colony from any potential raccoon source. However, most of these colonies exhibited the bell shaped temporal pattern (Table H.1) even though the evidence indicates that no raccoon perturbations ever occurred. Clearly, spoonbills select colony locations that do not have raccoons, but this does not explain the temporal pattern in question.

Availability and quality of food resources

By the time Allen (1942) completed his monograph, drainage of the Everglades was well underway and the scientific community was beginning to express concerns over the impact of human development on southern Florida ecosystems. He addressed the possibility that human activities could be affecting spoonbills through alteration of their prey base. However, he dismissed the possibility, citing the spoonbill's 'maritime nature' (a reference to their fidelity to using Florida Bay for nesting over the freshwater wetlands of the Everglades proper) and the lack of evidence that drainage of the Everglades was impacting the Florida Bay ecosystem. Specifically he stated that "...there does not appear to be any obvious connection between desertion of spoonbill colonies and drainage of the Everglades." However, by the late 1950s and early 1960's, Allen (1963) recognized that human impacts on the spoonbill's environment were altering nesting patterns. Specifically, he speculated that declines in nesting over time at colonies near the upper Florida Keys might be explained by the loss of primary foraging locations to urban development (Table H.2).

The hypothesis to be investigated is that land and water management practices in southern Florida have reduced the quantity and availability of food resources for Roseate Spoonbills and, as a result, are the major factors that determine nesting patterns in Florida Bay. The primary anthropogenic perturbations to spoonbill foraging grounds have been the filling of wetlands for urban development in the upper Florida Keys (Strong and Bancroft 1994; Lott et al. 1996) and the alteration of wetland type and function along the northeast coast of Florida Bay and southern Biscayne Bay through water-management practices (McIvor et al. 1994; Ross et al. in press; Chapter 2, Chapter 3). we will attempt

to show through an examination of data collected over the last 65 years that anthropogenic alterations to spoonbill foraging habitat have resulted in the observed patterns of nesting distribution and success in Florida Bay. More specifically, anthropogenic alterations to spoonbill foraging habitat have resulted in the observed patterns, indicating that spoonbills are sensitive to changes in the abundance, availability, and quality of their prey.

Although most spoonbills nest in the bay, during recent years most of these nesting birds have made daily flights to foraging grounds in the mainland wetlands north of Florida Bay. The salinity, water depths, and drying patterns of these wetlands have been altered by water management practices over the last 40 years (McIvor et al 1994) thereby altering the spoonbill prey base (Chapter 3). Plans to recover more natural surface and ground water flows into the mainland estuaries north of Florida Bay should positively influence spoonbill nesting patterns in the Bay.

MATERIALS AND METHODS

The 65 years of information on nesting and foraging patterns of Roseate Spoonbills in Florida Bay was principally gathered during four distinct study periods. Robert Porter Allen (RPA) led research efforts from 1935 until his death in 1963. Information attributed to RPA comes from his two books on the subject (Allen 1942; Allen 1947), an incomplete and unpublished report (Allen 1963), and from detailed field notes and correspondences housed at National Audubon Society's Field Research Office in Tavernier, Florida. Between 1966 and 1980, spoonbill data was principally collected through a coordinated effort between John C. Ogden (JCO), William B. Robertson, Jr., Barbara W. Patty and Alexander Sprunt IV. George V.N. Powell (GVNP) and Robin D. Bjork (RDB) led a comprehensive study on spoonbill nesting and foraging from 1984-1993. Beginning in 1994, JJL collected nesting information. Each of these four principal spoonbill research efforts utilized different techniques and variable effort in assessing spoonbill nesting and foraging patterns in Florida Bay. we present data gathered from all four efforts in developing the trends and conclusions presented in this manuscript.

Assessment of foraging location

In order to identify the direction of foraging grounds from nesting colonies, flight line counts similar to those described by Dusi and Dusi (1978) were made by RPA, JCO et al. and JJL. Initially, the colony island was circumnavigated by boat in order to determine the least number of positions needed to observe birds arriving and leaving the colony from any direction. Once identified, the boat was anchored at each position for a predetermined amount of time and the number and direction (compass heading) of Roseate Spoonbills arriving and leaving the colony were then counted. In order to analyze the data, flights were grouped based on eight major compass points (i.e., all flights with compass headings between 22.5 and 67.5 were categorized as northeast, from 67.5 to 112.5 were east, etc.).

GVNP and RDB used following flights (Bjork and Powell 1994) to better characterize foraging flights made by nesting spoonbills. Individual birds were followed using a fixed-wing aircraft from their nesting colonies to the first foraging location. During the flight, a distance of at least 200 m was maintained between the aircraft and the birds to avoid influencing their flight path. When a flock was followed from a colony, one individual was selected as the target individual to be followed if the flock separated in flight. During the 1989-90 nesting season, 94 spoonbills were followed from 4 colonies (Sandy = 45, Tern = 26, N. Park = 12, S. Park =11). Mean and standard deviation of flight distance was calculated from these data. Also, initial flight compass heading and the compass heading from the colony to the destination site were recorded. The initial compass heading and final compass direction were compared using product-moment correlation coefficient (r^2) to determine if flight line observations were a good indicator of the direction of foraging location.

Colony Surveys

RPA surveyed Florida Bay by boat investigating locations of Roseate Spoonbill activity for nesting sites (Allen 1942). Subsequent investigators continued this practice while also investigating all islands that were previously reported to have spoonbill colonies. The techniques and timing of nest count surveys varied according to the researcher.

RPA believed that spoonbills would abandon a colony in response to human disturbance within the colony (Allen 1942) and, therefore, strongly avoided entering active colonies. However, he observed nesting spoonbill activity from a blind on the periphery of a colony and found that one member of a nesting pair will relieve the other around dawn and dusk (Allen 1942). This information allowed him to estimate the number of nests within the colony by making crepuscular counts of the number of spoonbills entering and leaving a colony. Half of the total number of flights was approximately equal to the number of nests and averaging over a period of several days strengthened this approximation. He tested the accuracy of this method on several occasions by entering the colony following fledging and counting empty nests.

Subsequent researchers generally entered the colonies and physically counted the number of nests. This method was more accurate and less time-consuming, but was also potentially disruptive to nesting activity. In an attempt to minimize impact, visits to colonies did not begin until late in the incubation period, well after the birds were settled into the nesting cycle. Furthermore, researchers minimized the time in the colony to less than 1 hr whenever possible and active colonies were entered only during mild climatic conditions. Many surveys were not completed until after chicks fledged so that there was no chance of colony disruption. Such surveys ran the risk of underestimating the number of nests since vacant nests were often destroyed by other wading birds in need of nesting material. Therefore, post-fledging surveys were made immediately after young left the island. JCO et al. also used aerial surveys to estimate the number of nests within certain colonies. Since spoonbills generally nest in dense mangrove understory, nest counts made from the air are not considered as accurate as the other methods. Powell et al. (1989) annotated the results of Florida Bay Roseate Spoonbill nesting surveys from 1935 to 1988 with the type of survey used.

Starting about 1978, spoonbills began to occasionally nest a second time per season. Initially, these efforts were small in number (on the order of 10 nests) but have increased in effort in recent years (several hundred pairs re-nested in 1998-99). Second nestings were not included as part of this analysis.

The latitude and longitude of each colony was multiplied by the number of nests within the colony to generate mean nest location for all Florida Bay nests. Standard

deviations were also calculated for both longitude and latitude. These calculations were made for the first survey (1935) and at approximately 10-year intervals thereafter, except during the 1940's when no surveys were performed. No survey was made within a year of 1964-65 so both the 1962-63 and 1966-67 means were used. Likewise no survey was made within a year of 1994-95 so both the 1990-91 and 1998-99 mean were used.

Nesting success

The most accurate estimates of spoonbill nesting success were collected by GVNP and RDB from 1987-88 through 1991-92. Reproductive data were collected from the three largest spoonbill colonies (Sandy, Tern and Porjoe keys) except during 1989-90 and 1990-91 when only Sandy and Tern key colonies were monitored. Transects were established in each colony so that representative samples of nests could be monitored. Nests were individually marked with numbered plastic tags; each colony was visited every four to six days and the content of each nest was recorded. Information on clutch size, duration of nesting, reproductive success and cause of nest failure was collected for each nest. Estimates of reproductive success for each colony were calculated using the Mayfield (1975) method which prorates survival of repeatedly visited nests for the entire reproductive cycle and allows the sample to be extrapolated to estimate success of the entire colony. Survival rates were estimated through 21 days of age.

JJL used a variation of this mark/revisit technique from 1994 to 1999. Nests were marked at Tern, Sandy and Duck keys and revisited at approximately 14-day intervals. On the initial visit, between 25 and 50 nests were marked (unless the colony had fewer than 25 nests, in which case all nests were marked) and the number of eggs per nest counted. Nests were monitored until failure or until all surviving chicks reached >21 days of age. The survival of chicks to >21 days of age was the criterion successful nesting. Subsequent counts of fledged young of the year at the colonies corroborated this method.

Young-of-the-year spoonbills are easily distinguishable from adults and become highly conspicuous from outside the colony during the fledging process (Allen 1942). The total production of a colony can be estimated by counting the number of visible fledglings just prior to their leaving the colony. An estimate of nest success can be

calculated by dividing the fledgling count by the number of nests within the colony. RPA, JCO et al., and JJL used this method to estimate nest success, and estimates were corroborated with the biologists' impressions of success of the colony from their field notes. Furthermore, each researcher supplemented their success estimates with additional data. RPA strengthened the estimate by making multiple counts of the fledglings from the time they first became conspicuous until the time they left the colony. The largest of these counts was then used as the estimate for colony production. Richard T. Paul (pers. comm.) has validated this technique. JCO et al. would first count the number of visible fledglings from outside the colony and then would confirm the count upon entering the colony. Furthermore, they would make note of the number of chicks found dead within the colony, thereby supporting their estimate of nest success (also see Robertson et al. 1983). JJL used this method in 1998-99 while performing a bay-wide nesting survey. The results were supported by estimates made at nearby focal colonies using mark/revisit technique.

Nesting success estimates are reported for each region within the bay (hereafter referred to as 'colony groups'). Frequently, accurate nesting success estimates were collected at only one colony per colony group. In such cases, the individual colony estimate was used for the entire colony group. In cases where more than one colony per group had accurate nest success estimates, the total production of the combined colonies with estimates was divided by the total number of nests within those colonies to produce a success estimate for the colony group. Although accurate nest success rates were not made for all years, field notes frequently allowed for a qualitative assessment as to whether the colony succeeded (more than 1 chick per nest) or failed (less than 1 chick per nest). These were included as part of the analysis of nesting success.

Foraging habitat

Strong and Bancroft (1994) determined that almost 40% of the mangrove habitat on the mainline Keys between Lake Surprise and the southern end of Lower Matecumbe Key was filled by 1989. However, all mangrove forest types (Lugo and Snedaker 1974) are not equally valuable as foraging habitats for spoonbills. The highly specialized feeding behavior requires that they feed in open, shallow-water habitats such as

mangrove ponds and mud banks (Allen 1942) at water depths less than 20 cm (Powell 1987). In reference to mangrove-forest types, dwarf mangrove forests provide large expanses of suitable foraging habitat. Along the mainline Keys this habitat type generally occurs as part of the transitional zone between Florida Bay and the hardwood hammocks that grow on the uplands (Strong and Bancroft 1994). The amount of dwarf-mangrove forest, open-mangrove slough and mangrove-lined ponds lost to development on the mainline Keys needed to be estimated so as to understand spoonbill foraging patterns on the Keys.

Photographic evidence was used to evaluate the loss of spoonbill foraging habitat in the upper Florida Keys. Low-level aerial photographs of the area from Lake Surprise on Key Largo through Long Key were used to quantify suitable spoonbill foraging habitat, i.e., open canopy mangrove wetlands. Although a small amount of wetlands had been filled on the Keys prior to 1955, photographs taken in March of that year indicated that Keys wetlands were relatively unaltered at that time. Photographs from 1965 and 1975 were used to reflect the amount of spoonbill foraging habitat lost to dredge and fill development on a decadal scale. All wetland areas that remained intact through to the present were visited to verify that habitat types were correctly identified from the photographs. Image analysis software was used to compare the relative amount (percentage) of spoonbill foraging habitat left in 1965 and 1975 compared to the more pristine conditions of 1955. By visually inspecting sets of aerial photographs taken in 1955, 1959, 1964, 1971 and 1975, the location and approximate timing of fill projects were identified. Where possible, survey records and government documents were used to corroborate the timing of dredge and fill projects. However, government regulations were relatively lax prior to 1972, and accurate records for many projects were not available.

Seasonal rainfall and deviation from mean seasonal rainfall from 1963 to present were calculated from monthly rainfall data acquired from the South Florida Water Management District's Surface Water Conditions Detail Report. Monthly averages were from approximately 150 rainfall collection stations located from the Kissimee region southward. Therefore, these data reflect conditions for the entire southern Florida landscape.

RESULTS AND DISCUSSION

Location of foraging grounds by colony group

The mean foraging flight distance by nesting spoonbills was calculated to be 12.4 $\pm$ 5.8 km (mean $\pm$ s.d.) based on the 1989-90 following flights. The data were skewed toward shorter flights with 83.3% of the flights less than 16 km, however, several flights greater than 30 km were also recorded. Figure H.5 shows the location of all spoonbill colonies observed in Florida Bay since 1950 and the mean foraging circumference (based on the 1989-90 estimate) around each colony. Bancroft et al. (1994) demonstrated that wading birds nesting in the Everglades selected colony locations based on proximity to primary foraging grounds. They argued that a given colony's primary foraging area would be located within the mean foraging flight radius at the time of colony formation (Bancroft et al. 1994). Based on these conclusions, Florida Bay's spoonbill colonies were divided into five geographical colony groups based on primary foraging ground location as predicted by the mean foraging flight radius. The 12 colonies within the southeastern colony group have a mean flight radius that includes southern Key Largo and Plantation Key (Figure H.5A). These areas had extensive mangrove forests prior to urban development (Strong and Bancroft 1994). Spoonbills from these colonies probably used these wetlands as primary foraging grounds. The four southwestern colonies encompass Lower Matecumbe Key. This area was also rich in mangrove swamps prior to urban development and was likely the primary foraging area for birds nesting in this colony group (Figure H.5B). Flight radii around the seven northeastern colonies predict that these birds would forage in the mainland mangroves from Taylor Slough to Manatee Bay (Figure H.5B). The three colonies in the northwestern colony group would be predicted to forage among the extensive salt marshes and mangrove swamps of Cape Sable (Figure H.5C). The central colony group is represented by four colonies that fringe both eastern mainland and Plantation Key habitats within their mean foraging flight circumference (Figure H.5C). Birds from these colonies probably would feed in a variety of habitats. The 1989-90 mean flight distance is used here as a tool to subdivide the colonies into functional groups and is not meant to indicate that the birds feed exclusively within the areas depicted in Figure H.5. Indeed, the relatively large standard deviation (5.8 km)

indicates that birds foraged well beyond the area indicated in Figure H.5. However, the division into colony groups is justified based on the observation that wading birds nest in relative proximity to their primary foraging grounds (Bancroft et al. 1994).

The following of foraging spoonbills in fixed wing aircraft in 1989-90 indicated that the initial compass heading of a bird leaving a colony and the final foraging location of that bird (compass heading from the colony of origin to the final foraging location) were strongly correlated (r^2=0.78). These results indicate that the direction of flight lines from a colony are good predictors of the direction of the final foraging location. Therefore, flight line observations can be used to support the predicted location of primary foraging grounds based on mean foraging flight radii (Table H.3).

Flight line surveys taken from 1957 to 1963 at southeastern colonies indicate that birds flew predominantly east and northeast toward Plantation Key and southern Key Largo as was predicted (Table H.3). More than 55% of the almost 3000 flights observed from the southeastern colonies between 1957 and 1963 were directed towards Plantation Key and southern Key Largo (Table H.3). This was particularly evident prior to 1960 (Table H.3). Field notes from several researchers confirmed that Roseate Spoonbills were foraging heavily within the wetlands on southern Key Largo and Plantation Keys during this period (R.P. Allen field notes; J.C. Watson field notes; A. Sprunt IV pers. comm.). Collectively, these observations indicate that birds nesting in the southeast region heavily depended on mainline Keys' wetland habitat as principal feeding areas.

Most of the flight-line observations from northeastern colonies were made between 1973 and 1979. The results strongly indicate that these colonies focused foraging effort toward the mainland wetlands north of eastern Florida Bay (Table H.3). Eighty percent of more than 3000 observed flights were toward the mainland. Following flights made in 1989-90 confirmed that birds from the northeastern colonies predominantly foraged in the mangrove wetlands north of the bay (Figure H.1).

Although the number of flight-line counts in the northwestern colony group was relatively small compared to the northeastern and southeastern groups, the results strongly indicate that birds from these colonies foraged on Cape Sable (Table H.3). From 1977-79, 94% of the 345 flights observed were directed toward the Cape. The 1989-90

following flights confirmed that the wetlands of Cape Sable were the primary foraging ground for these colonies (Figure H.1).

No flight line counts were made for colonies in the central colony group, however, 11 of the 1989-90 following flights originated at South Park Key in the central colony group. Six of the followed birds foraged on the mainland north of the colony. Five others foraged on bay keys (Figure H.1). Although limited, these results suggest that birds from central colonies utilize both the mainland wetlands and wetlands on bay keys for foraging.

No flight line nor following flight data were collected for colonies in the southwest colony group, however, field notes (Robertson 1978; JCO. pers. Obs.; A. Sprunt IV pers. comm.) reported that foraging spoonbills utilized the wetlands on Lower Matecumbe and Long keys during the period when the southwestern colonies were most active. These reports support the prediction based on mean foraging radii that spoonbills in the southwestern colonies foraged principally in wetlands on Lower Matecumbe Key (Figure H.5B).

Temporal changes in relative nesting effort by colony group

Between 1935 and 1940, Roseate Spoonbills nested exclusively in the southeastern colony group, principally on Bottle Key (Table H.1). When surveys were resumed in 1950, spoonbills had expanded their nesting range throughout the southeastern colony group and into the northeastern colony group (Table H.1, Figure H.6A). Through the 1950's, 70% to 90% of the nesting activity occurred in the southeastern colonies with the remaining 10% to 30% in the northeast (Figure H.6A). Between 1963-64 and 1968-69, the number of spoonbills nesting in the southeast colony group dropped to about 10%. Since that time, southeastern colonies have only accounted for 2% to 18% of the nests found in Florida Bay.

The decline in the southeast colonies was concurrent with increases in nesting effort in both the southwestern and northeastern colonies (Figure H.6A). The southwestern colonies peaked at about 30% to 40% of nesting effort in the late 1960's and early 1970's, after which they declined to between 8% and 12% from mid-1970's through

mid-1980's. Since 1984-85, the southwestern colonies have made up less than 5% of the total nesting effort in Florida Bay (Figure H.6A).

The northeastern colonies included about 60% of the nesting effort by 1968-69 and remained at this level through 1984-85 (Figure H.6A). After the 1984-85 nesting season, the number of nests in northeastern colonies began to decline and by 1991-92, less than 40% of the nests were located in the northeastern colony group. This decline continued through the 1990's and by the 1998-99 survey, only 22% of the nests were found in the northeastern bay.

Spoonbills first nested in the northwest colony group in 1974. Between the mid-1970's and the mid-1980's about 20% of the nests occurred there (Figure H.6A). The percentage in the northwest increased to about 40% by the early 1990's, roughly equal to the number of nests found in the northeast at that time. By 1998-99, the majority of spoonbill nests (53%) were located in the northwestern colony group (Figure H.6A).

Low numbers of spoonbills nested intermittently at the four central bay colonies beginning in the early 1960's. During the 1980's spoonbills began to nest more consistently on these colonies and they accounted for more than 10% of the nests from 1987-88 to 1991-92.

Three general nesting periods can be identified by the examination of mean (and standard deviation) nest location through time (Figure H.6B). From 1935 to about 1963 Roseate Spoonbills nested predominantly in the southeastern part of the bay as indicated by the relative compact standard deviations (Figure H.6B). During this period the general direction in range expansion was toward the southwest, however, in 1962-63 there was range expansion to the north as indicated by the latitudinal standard deviation.

A relatively abrupt change in the direction of nesting range expansion occurred between 1962-63 and 1966-67 (Figure H.6B) indicating the start of the second nesting period. Between 1966-67 and 1984-85 the mean nest location was in the northeastern bay. The standard deviation around mean latitude became more compact indicating the pronounced decrease in nesting effort in the two southern colony groups (Figure H.2; Figure H.6A). Longitudinal standard deviation increased during this period owing to the colonization in the northwestern colonies and to the subsequent increase in effort at those colonies (Figures 4.6A and 4.6B).

The third nesting period (about 1984-85 through 1998-99) was characterized by the increase in nesting in the northwestern colony group and the decline in the northeastern effort. Figure H.6A and 4.6B show that by the mid-1980's, spoonbills began to select nesting locations in the northwest colonies over those in the northeast. This westward movement was apparent by 1990-91 and continued through 1998-99 (Figure H.6B). Low variance in the latitudinal direction indicates that effort in the southern bay was relatively low while the wide east-west variation indicates significant nesting still occurred in the northeastern bay (Figure H.6B).

The examination of relative nesting effort and mean nest location within Florida Bay indicates that spoonbills shifted nesting location in the mid-1960's away from the southeastern colonies and moved toward the northeastern colonies. A second event occurred in the mid-1980s when preferences shifted from the northeast to the northwest. The changes were relatively swift having become apparent in just 4 or 5 nesting cycles in both cases. The causes of these shifts is paramount to understanding the nesting patterns exhibited by spoonbills within individual colonies.

Nesting patterns and external influences by colony group

Two anomalies in the number of nesting pairs must be addressed before proceeding with the identification of potential causal agents leading to the observed changes in spoonbill nesting patterns. The observation of more than 1200 nests in the 1978-79 nesting season was unprecedented in the record (Figure H.2). All but two of the other years in which nest surveys were done had less than half of the number of nests counted in 1978-79. All active colony groups (the central colony group was not active at the time) showed sharp increases in the number of nests indicating that the increase was a bay-wide phenomenon (Figure H.2). A similar situation occurred during the 1962-63 nesting season, although the magnitude of the increase was much smaller than that of 1978-79. In 1962-63, the total number of nests reached an unprecedented high to that point in time and the nest numbers nearly doubled in all active colony groups over the previous nesting year (Figure H.2; Table H.1).

Allen (1942) proposed that spoonbills from Caribbean islands (most likely Cuba) periodically immigrate to Florida Bay, thereby providing a possible explanation for the

sharp increases in the spoonbill population between 1961-62 and 1962-63 and again between 1977-78 and 1978-79. The anecdotal evidence presented by Allen (1942) and his subsequent field notes indicate that such immigrations might be episodic. Robertson et al. (1983) indicated that although some communication between Cuba and Florida Bay probably occurs, the frequency of such migrations are unknown and are probably not part of an annual migration pattern. Allen's notes indicate that an immigration episode occurred following the 1961-62 breeding cycle (February 1962). Three flocks totaling more than 250 Roseate Spoonbills (many, if not all, adults) were observed arriving in the Key Largo area from offshore. One of the flocks was observed over the Gulf Stream heading toward southern Key Largo. The following year, the nesting population of Florida Bay increased by almost 400 birds (200 nests). Although no such observations were reported prior to the 1978-79 nesting season, it is possible that an influx of adult spoonbills from the Caribbean could account for the observed increase.

Subsequent results and discussion focus on trends within the Florida Bay population by colony group. Since the enigmatic increases in the spoonbill nesting population in 1962-63 and 1978-79 distorts these trends, these years have been removed from Figure H.7 and will not be addressed further.

Southeastern and southwestern colony groups

The record of nesting in the southeastern colonies indicates that the number of nests increased exponentially from 15 nests on one key (Bottle Key) in 1935-36 to a peak of almost 200 nests in 1955-56 (Table H.1; Figure H.7). This period of growth was followed by an almost complete collapse of the southeastern nesting colonies to a low of 5 nests in 1969-70 (Figure H.7). The colonies recovered during the 1970's and by the mid 1980's they were supporting between 75 and 100 nests annually (Figure H.7).

At the time of the 1960's collapse, Cowpens Key was the largest spoonbill colony in Florida Bay (Table H.1) and, as such, was the subject of frequent monitoring. Records indicate that Cowpens supported 50 to 75 nests annual between the years 1955-56 and 1961-62 (Figure H.3). The next survey (performed in 1966-67) found the colony deserted and subsequent surveys revealed only low level nesting efforts (Figure H.3). Flight line counts taken during the peak nesting years at Cowpens indicated a dramatic

change in foraging patterns by breeding spoonbills (Figure H.8; R.P. Allen field notes). In 1957-58 almost all foraging flights were directed toward the east and southeast (Figure H.8; Figure H.1). Large numbers of spoonbills in breeding plumage were observed foraging in two large wetlands on the northern end of Plantation Key less than 2 km to the east and southeast of the Cowpens colony (Figure H.8; Figure H.1). These observation strongly indicate that spoonbills nesting at the Cowpens colony were primarily foraging in these wetlands.

Between, the 1957-58 and 1958-59 breeding cycles, the wetland to the southeast was filled for urban development (Table H.2; Figure H.8). Flight line counts from 1958-59 indicate that spoonbills no longer directed flights toward the southeast presumably because there were no longer any substantive foraging grounds in that direction (Table H.2; Figure H.8). Adults increased flights toward the east and toward a large wetland on southern Key Largo approximately 5 km to the northeast (Figure H.8). This observation was again supported by the presence of large numbers of spoonbills feeding in the wetlands to the east and northeast of Cowpens. No observations of the Cowpens colony are available for 1959-60 but by 1960-61, most of the large wetland to the east of the colony had also been filled (Table H.2) with the predictable result of greatly reduced foraging effort in that direction (Figure H.8).

Prior to the filling of these two wetlands on Plantation Key, spoonbills rarely flew from the colony toward the north, west or south (Figure H.8). Following the destruction of feeding sites, spoonbill flight directions from Cowpens moved increasingly in these direction and by the 1961-62 and 1962-63 breeding seasons, there was no apparent preference in flight direction from the colony (Figure H.8). Sometime between the 1962-63 and the 1966-67 breeding cycles, Cowpens Key was abandoned by nesting spoonbills. Similarly, the number of nests in the southeastern colonies declined sharply following urban development in the late 1950's (Table H.2; Figure H.7).

Roseate Spoonbills first initiated colonies in the southwest colony group in the early 1960's, however, large numbers were not reported until 1966-67 (Table H.1; Figure H.7). Between 1966-67 and 1970-71, the southwestern colonies supported approximately 100 nests or about 35% of Florida Bay's nesting spoonbill population (Figure H.7). This increase coincided with the decline in the southeast colonies (Figure H.7) suggesting that

birds that abandoned colonies in the southeastern colony group may have relocated in the southwestern colonies. Between 1970-71 and 1975-76 the number of nests in the southwest declined by about 50%. The downward trend has persisted at a more gradual rate during the remaining period of record (Figure H.7).

The southwestern colonies were the least studied of the five colony groups. No information regarding flight lines or foraging locations was collected. However, anecdotal evidence suggest that the birds nesting in this region foraged in the expansive wetlands that existed on Lower Matecumbe and Long keys prior to 1972 (Table H.2). Large portions of these wetlands were filled in the early 1970's (Table H.2). Based on the observed impact of dredge-and-fill projects on the Cowpens Key colony, it is likely that the filling of approximately 134 acres of wetlands on Lower Matecumbe Key in 1972 (Table H.2) resulted in the observed rapid decline of nests in the southwestern colonies between 1971 and 1976.

Between 1950 and 1972, spoonbills nesting in the southern colony groups averaged more than two offspring per nest and succeeded in all of the 17 years that data were collected (Table H.4.4). Following dredge-and-fill development, spoonbills averaged 0.22 young per nest and had successful nestings in only 2 of 10 years that nesting success data were collected for the southeastern colonies and 2 of 8 years for the southwestern colonies (Table H.4). Observations from the southern colony groups indicate that development in the Keys resulted in loss of primary foraging habitat. As a result, nesting effort in individual colonies apparently declined in relation to amount of nearby primary foraging habitat lost to development. Spoonbills may have responded by switching to nesting sites in other regions. Although a 1972 law stopped large-scale dredge-and-fill projects in the Keys (Lott et al. 1996), developers rushed to fill massive amounts of wetlands in the early 1970's so as to circumvent the intent of the law (Table H.2). During this push, the last known important spoonbill foraging habitats were filled on the mainline Keys. Breeding spoonbills in the southern part of the bay no longer had access to prime foraging grounds and were probably no longer able to efficiently gather enough food for young. As a result, the remnant nesting population in these colonies has been less successful in fledging young since 1972 (Table H.4). Prior to the final

development push, spoonbills in both colony groups were still producing young at the highest rates observed in Florida Bay for the period of record.

The relative lack of hurricanes between 1950 and 1999 may have also played a role in the declining use of the southern colonies. Moderate to large hurricanes affect the upper Keys and Florida Bay at approximately 25-year intervals (Gentry 1974). These events destroy mangroves and open up expansive areas to spoonbills for foraging. Over time, mangroves fill these areas back in (Bjork and Powell 1990). The lack of a major hurricane impact on the upper Keys and Florida Bay since 1965 has resulted in loss of spoonbill foraging habitat and may have played a role in the decline of spoonbills in the southern bay (Bjork and Powell 1990). However, the impact of hurricanes on spoonbill foraging is sporadic and probably minor compared to the impact of urban development. That hurricane impacts were minor compared to urban development was indicated by the fact that spoonbills did not re-colonized the Cowpens colony following Hurricane Betsy in 1965, even though Betsy substantially opened the mangrove canopy in the upper Keys and eastern Florida Bay.

Sea-level rise has changed the topography of many of the bay keys. For example; in 1935 when Spoonbills initially re-colonized Florida Bay, Bottle Key (site of the founding colony) had internal lagoons that were largely covered by a canopy of scrubby mangrove (photograph; Alexander Sprunt IV) reminiscent of the current colony site at Tern Key. These mangroves were destroyed in Hurricane Donna and did not recover. Wanless et al. (1994) demonstrated that loss of wetland habitat to sea-level rise is manifested during catastrophic events. Similar changes in habitat to that of Bottle Key were demonstrated to have occurred on Cape Sable when Hurricane Donna passed over the area (Wanless et al. 1994). The change in habitat on the bay keys as a result of sea-level rise as manifested during hurricanes Donna in 1960 and Betsy in 1965 could have resulted in the destruction of important nesting and foraging sites.

Northeast colony group

Roseate Spoonbills began nesting in the northeastern colony group in the early 1940's (Table H.1). From 1950 to 1960, the number of nests gradually increased (Figure H.7), accounting for as much as 30% of the total nests in Florida Bay (Figure H.6A).

However, the total number of nests never exceeded 50 (Table H.1; Figure H.7). Between the 1961-62 and the 1966-67 nesting seasons the number of nests in the northeast increased to about 200 (Figure H.7). This increase roughly coincided with the decline in the southeast colonies (Figure H.7) suggesting that some of the birds that abandoned colonies in the southeastern colony group relocated to the northeastern colonies. The number of nests increased to a peak in the late 1970's (Figure H.7; Table H.1).

No data were collected in the early 1980's; however, by 1984-85 the number of nests in the northeast had noticeably declined (Figure H.7). With the exception of the 1992-93 nesting season, the number of nests continued a decline from 1984-85 to 1998-99 (Figure H.7). Although complete colony surveys were not made between 1992-93 and 1998-99, nest counts at the two largest colonies in the northeastern colony group (Tern and Porjoe Keys) provide evidence of a regional decline in nesting during the intervening years (Figure H.3; Table H.1).

Following flights (Figure H.1), flight line counts (Table H.3) and tracking of radio tagged spoonbills (Bjork and Powell 1994) demonstrated that spoonbills nesting in the northeastern colonies foraged almost entirely in the coastal wetlands associated with Taylor Slough on the mainland north and northeast of eastern Florida Bay. Johnson and Fennema (1989) examined data from water level recorders in the Taylor Slough watershed from 1956 to 1988. They found that water levels in the headwaters region of Taylor Slough were correlated with the amount of fresh water reaching Florida Bay. By including intra-annual variation in rainfall in their analyses, they showed that water management practices had profoundly impacted the Taylor Slough/northeastern Florida Bay watershed. Subsequent studies strongly supported this conclusion (Van Lent et al. 1993; McIvor et al. 1994; Meeder et al. 1996; Ross et al. in press; Chapter 2; Chapter 3).

Johnson and Fennema (1989) identified three distinct periods of water management that affected this region. During Period I (1956-1964) the impact of water management on the wetlands was relatively small. Period II (1970-82) was characterized by the completion of the C-111 and associated canals and operation of those canals under the Minimum Schedule of Water Deliveries. Water management during Period II resulted in much lower wet season water levels and slightly lower dry season water levels in the headwaters of Taylor Slough (Figure H.9). The above-mentioned correlation

between water levels in the Taylor Slough headwaters and fresh water flows toward Florida Bay indicates that much less freshwater was reaching the coastal areas during the wet season and that dry seasons may have been relatively drier (e.g., lower water levels, shorter hydroperiods) during Period II. Period III (1983-1988) was characterized by the completion of the SDCS and its operation under the Experimental Program of Water Deliveries. During Period III, wet season water levels remained about the same as Period II (i.e., lower than the relatively unaltered condition of Period I), however, dry season water levels were significantly higher than in either of the two preceding periods (Figure H.9). This indicates that during the dry season, Period III water management practices artificially increased water levels in the coastal wetlands, thereby reducing intra-annual variation in water depth (Figure H.9; Johnson and Fennema 1989).

To examine the affect of water management on spoonbill nesting patterns, the years 1964 through 1969 were included as part of Period II. Johnson and Fennema (1989) did not include these years in Period II because the C-111 canal was being constructed during this period and, therefore, the impact of the canal was not fully realized. However, they state that water levels were artificially lowered during construction of the canal system, thereby impacting the coastal wetlands and justifying the inclusion of these years in Period II (i.e., Period II is defined from 1964-1982). Likewise, the SDCS and the Experimental Program of Water Deliveries has remained largely unchanged in structure and operation since 1988 (Ley et al. 1995, United States Army Corps of Engineers 1995) and, therefore, Johnson and Fennema's (1989) Period III will be extended to include 1989 through 1999 (i.e., Period III is defined from 1982-1999).

During Period I, between 11% and 34% of Florida Bay's Roseate Spoonbill population nested in the northeastern colonies (Figure H.6A) and foraged in the mainland coastal wetlands (Table H.3). Only two estimates of nest production were made at northeastern colonies during Period I. In 1955-56, the Stake Key colony was estimated to have produced 2.3 chicks per active nest, and in 1961-62, the Porjoe colony was estimated to have produced 3.0 chicks per active nest.

Period II corresponds to an era of rapid growth in the number of Roseate Spoonbills nesting in the northeastern colonies (Figure H.7). Initially, Period II had high

success rates and colonies succeeded in all years surveyed between 1964 and 1975 (Table H.5). However, between 1975 and 1982, four out of five years surveyed resulted in nest failure (Table H.5). All years that failed had lower than average rainfall during the wet season, while 8 of 10 successful years had above average rainfall during the wet season (Table H.5). Overall, the percentage of successful years was relatively high (71%) during Period II, but the estimated production rates were much smaller than those found in the southeastern colonies during the 1960's (1.38 verses 2.25 mean chicks per nest; Tables 4 and 5).

At spoonbill foraging grounds in northeastern Florida Bay, water management practices would have resulted in greatly reduced freshwater flow in the wet season during Periods II and III (Johnson and Fennema 1989; McIvor et al. 1994). Several studies (McIvor et al. 1994; Meeder et al. 1996; Ross et al. In press) indicated that salinity in the coastal wetlands increased and became more variable during this period, supporting the findings of Johnson and Fennema (1989). Chapter 3 indicated that higher and more variable salinity in the same coastal wetlands resulted in lower prey-base biomass for foraging spoonbills. All four years that spoonbill nesting failed during Period II had lower than average rainfall during the wet season (Table H.5), possibly exacerbating the impacts of water management practices and further reducing the prey production through increased variability in salinity. Likewise, eight of the ten successful years during this period occurred when wet season rainfall was above average, possibly ameliorating the impact of water management resulting in relatively higher prey abundance. During these eight years, dry-season rainfall ranged from 62% above average to 48% below average indicating that dry-season rainfall was not likely a factor in determining success so long as sufficient rainfall occurred during the wet season.

During Period II, artificially lower dry-season water levels in the Taylor Slough headwaters may have resulted in shorter hydroperiods and lower water levels in the coastal wetlands (Johnson and Fennema 1989; Van Lent et al 1993). In turn, this may have enhanced the concentration effect on prey, making them more available to predators (Kushlan 1978; DeAngelis et al. 1997), i.e., the wetlands as a whole may have suffered a reduction in secondary production due to increased salinity variability, but the fish that were produced were presumably more available to predators such a spoonbills. This may

help explain the relatively high success rates during Period II relative to Period III (Table H.5).

Both years that succeeded with lower than average rainfall during the wet season also experienced drought conditions during the dry season (Table H.5; 1964-65 and 1981-82). During drought years, low rainfall in the wet season would likely reduce the swings in salinity, making the ecotone higher in mean salinity but lower in variance. Even though mean salinity would be higher, the more constant salinity environment might be more favorable to primary and secondary production as compared to a fluctuating salinity environment (Montague and Ley 1993; Ley et al. 1994; Chapter 3). Furthermore, drought conditions would result in extreme low water events during the dry season thereby enhancing the prey concentration effect (DeAngelis et al. 1997; Chapter 6). Cumulatively, these drought conditions would likely result in a more abundant and more available prey base for nesting spoonbills when compared to years with low water levels during the wet season and high water levels during the dry season. As previously stated, the best conditions for nesting spoonbills presumably would be above average water levels in the wet season followed by below average water levels during the dry. Nest success estimates from Period II indicate that the worst conditions for nesting spoonbills would be the opposite; low water wet seasons and high water dry seasons. Drought conditions for the entire annual cycle appear to be intermediate.

Water management during Period III caused the mainland coastal wetlands to lose much of the seasonal nature of the hydrologic cycle (Figure H.9; Johnson and Fennema 1989) resulting in low-water wet seasons followed by high-water dry seasons (i.e., the worst case conditions for nesting spoonbills as per Period II results). These conditions would likely result in intermittent periods of flood and drydown throughout the year, making prey concentration events less predictable (Bjork and Powell 1994; Chapter 6). Furthermore, these conditions would also allow bay waters to encroach on the mainland coastal wetlands more frequently, resulting in higher mean salinity overall and more pronounced pulses in salinity (Van Lent 1993; McIvor 1994). Increased freshwater input during the dry season would do little to alleviate the artificially high salinity since bay levels would be naturally low (Powell 1987), thus allowing the freshwater to runoff quickly and mix with marine waters (Baratta and Fennema 1994). Mixing would be

exacerbated by the frequent cold fronts that impact the bay during the dry season (Holmquist et al. 1989; Baratta and Fennema 1994) and would increase variability in salinity. Higher means and greater fluxes in salinity would likely result in lower primary and secondary production (Montague and Ley 1993; Chapter 3) in the coastal wetlands during Period III compared to Periods I or II. The decline in prey production through changes in the salinity regime combined with the unpredictability in prey availability through reversals in dry season drydowns would make it harder for spoonbills to successfully forage on a consistent basis.

These conditions predictably resulted in low nesting success (Table H.5) and colony abandonment (Figure H.7) in the northeastern colonies during Period III. Nesting failed in most of the years recorded (only 36% of the years successful) while the estimated production was only 0.67 chicks per active nest (Table H.5). The only years with successful nesting where five consecutive years during a prolonged drought (1987-1992), as would also have been predictable from Period II results. The apparent exception during this drought period was in 1990-91 when most of the above average dry season rainfall occurred in April and May; after the nesting cycle was completed.

Central colony group

Significant nesting did not take place at the central colonies until the mid-1980's, although some nesting occurred in the 1960's, (Table H.1; Figure H.6). The increase in nesting effort in the central colonies coincided with the decline in nesting effort in the northeast, possibly indicating that birds relocated to this colony group. To date, little attention has been paid the central colonies and estimates of nest success are sparse. In 1966-67, nests at Manatee Key produced 2.3 chicks per nest. In 1978-79, the central colonies failed entirely, and in 1998-99, they produced an estimated 0.4 chicks per nest.

Northwestern colony group

Roseate Spoonbills began nesting in the northwestern colony group in the early 1970's (Table H.1) concurrent with the decline of the southwestern colonies (Figure H.7). Following the destruction of wetlands on Lower Matecumbe Key in 1972 (Table H.2), the direction of foraging flights from the Buchanan keys was predominantly toward Cape

Sable (JCO pers. obs.). Robertson (1978) indicated that the majority of spoonbills nesting in the southwestern bay foraged on Cape Sable although they continued to supplement their diet by feeding on Lower Matecumbe and Long keys. These observations suggest that destruction of wetlands on the mainline Keys resulted in a redirection in foraging effort that ultimately led to a change in nesting location from the southwest to the northwest in the 1970's.

Nesting effort in the northwest began an exponential increase starting in 1984-85 (Figure H.7). This increase coincided with the collapse of colonies in the northeastern region and with the continued decline of the southwestern colonies. Initially, nesting success in the northwest and the northeast were comparable. From 1973-74 to 1981-82, nest success was documented in both regions for 6 years (Table H.5) and comparisons of the individual years show that the two colony groups had very similar success rates. However, following the completion and operation of the SDCS in 1982 (Period III in the northeastern region), the northwestern colonies exhibited much higher nest production and had a higher annual success rate than the northeastern colony group (Table H.5).

Implications of nesting patterns on inter-regional and bay-wide scales

A comparison of nesting effort and nest success in the northeast and northwest colony groups suggests that operation of the SDCS under the Experimental Program of Water Deliveries has had a negative impact on Roseate Spoonbills. During Period II similar success rates in the northeast and northwest was probably due to the effects of system-wide conditions which either allowed for successful nesting or caused failure throughout the spoonbills nesting range in any given year. During Period III success rates in the northeast were much lower than the northwest. While climatological conditions affected both regions equally, water management practices in the northeast caused a deterioration of foraging conditions for spoonbills in that colony group. This conclusion is most evident from the decline in nesting effort in the northeast during the same period. An increase in the number of nests in the northwestern and central colonies over the same time period suggests that many of the birds abandoned colonies in the northeast in favor of nesting sites in other colony groups.

The most striking implication of these findings is that current water management practices in the southern Everglades have resulted in the ecological degradation of the coastal wetlands in northeastern Florida Bay. The most likely difference within the northeastern spoonbill niche between Periods II and III was the changes in the hydrology and hydrography caused by the SDCS and the Experimental Program of Water Deliveries. These hydrologic and hydrographic changes presumably impacted spoonbills by altering the availability of prey (Dumas in press; Chapter 3; Chapter 6). The severity of this wetland degradation was such that the spoonbill response (decline in nesting success and abandonment of colonies) was similar to the complete destruction of more than half of the suitable foraging wetlands on the mainline Florida Keys. Since a variety of other vertebrate predators (piscivorous fishes, reptiles including crocodilians, wading birds and other piscivorous birds) depend on this prey base during various stages of their life cycles (Loftus and Kushlan 1987; Loftus and Eklund 1994, DeAngelis et al. 1997), the impacts of the SDCS probably extend well beyond Roseate Spoonbill nesting patterns.

Although there are no data to suggest that mercury poisoning has been a factor in spoonbill nesting patterns in Florida Bay, mercury concentrations were higher in nestlings from northeastern colonies when compared to nestlings from the northwestern colony group (Sundlof et al. 1994). These nestlings probably obtained the mercury from the small fish and aquatic invertebrates brought in by parents from the eastern mangrove region. Mercury contamination has a number of effects on birds (Eisler 1987), many of which may affect both the initiation and success of reproduction. There is some evidence that these effects can lead to decreased nesting success (Beyer 1986). Therefore, high mercury levels in the mangrove ecosystem north of eastern Florida Bay can not be dismissed as a causal agent in the observed changes in spoonbill nesting patterns in the northeastern colonies. However, the large differences in the thresholds of various effects among species (Tisler 1987; Thompson et al. 1991) prevent any meaningful assessment regarding the implications of mercury in Florida Bay spoonbill chicks or adults without species specific effect studies. The most likely explanation for the patterns observed remains the environmental degradation of foraging grounds for the northeastern colonies.

The evidence presented indicates that Roseate Spoonbills are sensitive to anthropogenic alterations to their foraging grounds. Spoonbills appear to have responded to the destruction or degradation of primary foraging grounds by relocating nesting effort to other regions of the bay in proximity to other suitable foraging habitats. This switch to secondary foraging locations resulted in higher nest productivity compared to that found in the compromised colony group; however, overall production was reduced when compared to years prior to the given perturbation. For example, during the period that nesting predominantly occurred in the southeastern colonies (1950 to the mid 1960's), mean nesting success was estimated at 2.25 chicks per nest and success occurred in all years surveyed (Table H.4). Following the destruction of foraging grounds on the mainline Keys, spoonbills began to shift their nesting effort toward the northeastern colonies (Figure H.6). Nest success in the southeastern colonies dropped to 0.22 birds per nest with success in only 22% of the nesting years (Table H.4). During the next period when spoonbills predominantly nested in the northeastern colonies (1964-1982), mean nesting success was estimated at 1.57 chicks per nest and success in 75% of the years (Table H.5). Although this is much higher than that found in the southeastern colonies after Keys urban development, it is a substantial drop in success compared to the pre-development period.

Another change in nesting pattern occurred starting in 1982 with the completion of the SDCS and the beginning of the Experimental Program of Water Deliveries. In subsequent years, operation of the SDCS presumably degraded the primary foraging ground for the northeastern colonies; namely the coastal wetlands of Taylor Slough and the C-111 Basin. Mean nesting success in the northeastern colonies fell to 0.67 chicks per nest and success in only 36% of the years for the period 1982-1999. Similar to the shift from the southeastern colonies to the northeastern colonies following Keys development, spoonbills began to shift their nesting effort toward the northwest after the completion of the SDCS in 1982 (Figure H.6). From 1982-1999, northwestern colonies had a mean estimated success rate of 1.24 and succeeded in 62% of the nesting years (Table H.5). Although reproductive success was much higher than the northeastern colonies for the same period, it is a telling decline from success rates during Period II in the northeastern colonies.

The abandonment of the southeastern colonies between 1956 and 1961 (Figure H.7) occurred while nesting success was still high (Table H.4). It appears that spoonbills can continue to nest successfully when nearby foraging grounds are lost, so long as suitable foraging grounds are available within flight range. However, spoonbills do not maintain this strategy indefinitely, particularly when new colony sites are available closer to preferred foraging locations. For example, following the dredge and fill development of the late 1950's, most of the remaining foraging areas on the Keys were on Lower Matecumbe, possibly leading to the increase in nesting effort in the southwest colonies. Furthermore, the last major foraging ground in the Keys outside of Lower Matecumbe was Hammer Point on southern Key Largo. This wetland was sufficiently far north that it fell within the mean flight radius of several of the northeastern colonies. Increased nesting at these colonies may have been triggered by easy access to both the mainland coastal wetlands and the remaining Keys wetland. Similarly, following loss of habitat on Lower Matecumbe Key, spoonbills in the southwestern colonies continued to successfully by making flights toward Cape Sable. Shortly thereafter, nesting began in the northwestern colony group, closer to the Cape. Therefore, it appears that proximity to a readily available prey base would be the major reason for relocating. Bancroft et al. (1994) found that increased flight distance to feeding grounds corresponded with nest abandonment in Everglades wading bird colonies. In addition, they reasoned that changes in habitat quality resulted in changes in nesting colony location, and that the drop in habitat quality was likely due to changes in the prey base dynamics (Bancroft et al 1994; Loftus and Eklund 1994). These findings may apply to spoonbills as well. Proximity to prime foraging locations would result in less energy expenditure in gaining access to the food resource. Furthermore, less flight time between the nest and the food resource allows for greater foraging time, thereby increasing the likelihood of success.

Although spoonbills may locate their nests in proximity to their primary foraging ground, they are not restricted to feeding exclusively at that location. While flight line and following flight data indicate that most foraging flights were directed toward the closest suitable foraging site, several of the following flights were in excess of 20 km (longest was 38 km) toward more distant resources (Bjork and Powell 1994). This indicates that spoonbills, like other wading birds, will forage more widely, presumably

when nearby resources become scarce (Bancroft et al. 1994). It follows that the high success rates in the 1950's and 1960's may, therefore, be attributable not only to the high quality of foraging grounds on the mainline Keys, but also to the variety of foraging habitats within reasonable flight distance (e.g. mainland coastal wetlands, interior wetlands on bay keys, mud flats). As an example, nesting success at Cowpens in 1961-62 and 1962-63 was relatively high (about 2 chicks per nest in both years) even though the primary foraging grounds for this colony were already destroyed. Flight line counts indicated that these birds were making a significant number of flights toward the north (mainland coastal wetlands), northwest (Cape Sable) and west (bay keys and mud banks) as well as toward the remaining Keys' wetlands to the east (Figure H.8). Even though their proximal foraging ground was gone, they were able to achieve a high degree of success by using the mosaic of habitats available throughout the Florida Bay landscape (Figure H.8).

Wading bird feeding behavior requires that a dependable prey source be available during the nesting season within a reasonable flight distance from the colony (Bancroft et al. 1994). Spoonbill feeding behavior requires similar conditions (Bjork and Powell 1996; Dumas in press). However, the nature of the prey base itself is somewhat ephemeral. During a typical dry season, wind driven tides in Florida Bay can reflood foraging grounds for periods ranging from hours to weeks (Holmquist et al. 1989; Baratta and Fennema 1994; Bjork and Powell 1994; Chapter 6), thereby dispersing the prey base (Loftus and Eklund 1994; DeAngelis et al. 1997; Chapter 6). However, if several foraging habitats exist within flight range, then it is highly unlikely that all of them would be flooded at the same time by wind-driven tides. The ability to be wide ranging has allowed spoonbills to forage in remote areas when local foraging grounds were flooded. However, the loss of foraging habitat diversity in the Florida Bay landscape (e.g. destruction of wetlands in the Keys and ecological degradation of mainland coastal habitats in northeastern Florida Bay) has reduced the likelihood that suitable foraging habitat will be found on a consistent basis. Low foraging success over just a period of days could result in a failed nesting attempt through abandonment and starvation. In short, the unaltered Florida Bay had a mosaic of foraging habitats that resulted in successful reproduction in almost every year. The degradation of many of these wetlands

may have resulted in undependable and inconsistent food resources and increasing nesting failures. Based on these observations, it seems unlikely that the described anthropogenic disturbances simply impacted discrete colonies, rather, the impacts were probably bay-wide and cumulative in effect. The relatively recent trend toward nesting in the central colony group may be an attempt by spoonbills to nest in locations that have equal access to a variety of foraging habitat types.

CONCLUSIONS AND DISSERTATION SIGNIFICANCE

The preponderance of scientific information regarding Roseate Spoonbill nesting in Florida Bay indicate that land and water management practices in and around the Florida Bay landscape have affected nesting patterns. The response of spoonbills to foraging ground perturbations was a general relocation of nesting effort. This pattern supports the hypothesis that anthropogenic alterations to the landscape explains the bell-shaped temporal pattern in spoonbill nesting at the colony and regional levels. Other responses included a dramatic decline in nesting success within the impacted colony group and a decline in bay-wide nesting success. That spoonbills appeared to adjust nesting patterns when human activities altered primary foraging grounds indicates that their responses are related to food availability.

Unlike previous studies that attributed declines in Florida Bay predator population on declining food resources (reviewed in Chapter 2), we have rigorously examined trends in abundance of Roseate Spoonbill food resources (Chapter 3). Prey fish availability in the wetlands appear to be a function of hydrologically-related conditions on at least three levels. First, the previous chapter indicated that length of wet season hydroperiod is related to overall prey base abundance because it determines the time that fish can exploit seasonally inundated portions of the wetland (Kushlan 1976; Loftus and Eklund 1994; DeAngelis et al. 1997). The relatively short generation time and fast individual growth rates of the various fish species within the community allow these fishes to exploit this ephemeral resource (Loftus and Eklund 1994, DeAngelis et al. 1997). Second, Chapter 3 also indicated that the biomass of the prey base is impacted by hydrographic conditions; specifically, fish production is related to the salinity regime such that increased freshwater flow is correlated with increased prey base fish stock. This relationship may

be a function of salinity stress on primary producers and resultant limits in food availability for the prey base (Montague and Ley 1993; Ley et al. 1994). Third, the prey base is impacted by dry season water levels such that the density of fish per unit area (i.e., availability) at any given time is dictated by the severity of drying conditions and resulting concentration effect (Kushlan 1976; Kushlan 1978; Loftus and Eklund 1994; DeAngelis et al. 1997; Chapter 6). Gradual and constant declines in water levels over the course of the nesting period result in consistent concentrations of fish, while reversals in water level declines disrupt the concentration effect (Kushlan 1978; Bjork and Powell 1994; DeAngelis et al. 1997; Chapter 6).

Chapter 2 indicated that water management practices since the completion of the South Dade Conveyance System (SDCS) have shortened hydroperiods, increased mean salinity, and increased both the frequency and magnitude of salinity fluctuations in the mainland coastal wetlands. As implied in the previous paragraph, these condition would adversely impact spoonbill foraging success in these wetlands by decreasing overall prey abundance and biomass (Chapter 3). These interconnected events may explain the decline of spoonbill nesting effort and nesting success in the northeastern colony group since the SDCS became operational.

Current plans for restoring the Everglades watershed include the resumption of more natural freshwater flows through Taylor Slough and the C-111 Basin. Presumably, restoration would benefit spoonbills nesting in the northeastern Florida Bay by increasing prey abundance and biomass in the mainland coastal wetlands. Between September 1994 and December 1995, El Nino conditions resulted in unusually high rainfall throughout southern Florida. Fresh water discharges through Taylor Slough and the associated creeks to the east were on a level that may have been similar in quantity to historic flows (Armentano 1996), thereby allowing for a natural experiment concerning the impact of restoration on the spoonbills food web. The next chapter examines the responses of the prey base fish community and spoonbill nesting success to this high flow event. My hypothesis predicts that the fish abundance and biomass would be higher during this period than during other periods and that spoonbills would exhibit higher than normal nesting success as a result.

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Table H.1 Number of Roseate Spoonbill nests by colony and year. 1935-1988 as per Powell et al. (1989) unless otherwise noted. 1989-1999 from this study. "A" indicates colony was active with a small number of nests but no count was made. Empty cells indicate no data collected for that colony/year. Years without colony checks were omitted

	SOUTHEAST												NORTHWEST		
Year	Bottle	Stake	Cowpens	Cotton	West	Low	Pigeon	Crab	East	Crane	East Butternut	Middle Butternut	Frank	Oyster	Sandy
1935-36	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1936-37	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1937-38	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1938-39	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1939-40	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1942-43															
1943-44															
1950-51	5	12	3	18	0	0	0	0	0	0	0	0	0	0	0
1951-52	5	26	10	10	0	0	0	0	0	0	0	2	0	0	0
1952-53	0	34	8	0	0	0	0	0	0	0	0	4	0	0	0
1953-54	0	30	28		0	0	0	0	0	0	0	0	0	0	0
1954-55	13	47	39	0	32	25	0	0	0	0	0	0	0	0	0
1955-56	4	55	70	27	5	18	0	0	0	0	0	0	0	0	0
1956-57	0	45	70	25	0	22	0	0	0	0	0	0	0	0	0
1957-58			40[1]												
1958-59	5	5	75	20	0	0	0	0	0	0	0	0	0	0	0
1959-60	0	8	65	3	0	0	0	0	0	0	0	0	0	0	0
1960-61	0		70		0	0	0	0	0	0	0	0	0	0	0
1961-62	0		50	3	0	0	0	0	0	0	0	0	0	0	0
1962-63	0	35	75	15	0	0	0	0	0	45	0	0	0	0	0
1966-67	0	10	0	0		20	0	3	0	24	0	0	0	0	0
1968-69	5	15	A	0	0	2	0		0	A	0	0	0	0	0
1969-70	5	A		0		0	0		0	A	0	0	0	0	0
1972-73													A[2]		0[2]
1973-74														20[2]	
1974-75	14[2]												24[2]	57[2]	
1975-76	25		30	0		0	A		0	A	0	A	47	105	4[2]
1976-77														81[2]	
1977-78	0	41	13	0	A	0	A	A	0	31	8	0	36	56	25
1978-79	23	77	69	0	0	4	30	0	0	A	4	0	62	64	80
1979-80			7[3]												
1980-81			6[3]												
1984-85	0	0	12	0		0	0	0	12	14	0	26	0	3	62
1985-86	0	0	0		7	0	0	8	6	17	0	66	0	6	139
1986-87	0	0	15	0	2	0	0	0	7	27	0	42	0	0	107
1987-88	0	0	14	0	9	0	12	0	0	12	8	14	4	0	151
1988-89	6	0	14	0	8	0	0	0	0	21	10	10	13	4	223
1989-90	19	8	9	0	1	0	3	0	0	17	6	12	22	9	163
1990-91	30	19	8	0	8	0	8	0	0	13	11	18	23	8	221
1991-92	40	18	8	0	6	0	5	0	0	13	4	17	46	45	232
1992-93															200
1994-95															250
1995-96															130
1996-97															196
1997-98															165
1998-99	28	0	10	0	0	0	8	7	2	11	4	47	125	23	177

[1]RPA reported 52 nests at other unspecified colonies; colony checks were incomplete. R. P. Allen. Notes, National Audubon Soc., Tavernier FL.
[2]Field notes J.C. Ogden.
[3]Notes from A. Sprunt IV

Table H.1. (cont.)

	CENTRAL				NORTHEAST							SOUTHWEST			
Year	Bob Allen	Manatee	Jimmie Channel	South Park	North Park	Tern	North Nest	South Nest	Porjoe	Duck	Pass	East Buchanan	West Buchanan	Barnes	Twin
1935-36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1936-37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1937-38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1938-39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1939-40	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0
1942-43									A[4]						
1943-44									A[4]						
1950-51	0	0	0	0	0	10[5]	5	0	11	0	0	0	0	0	0
1951-52	0	0	0	0	0	9[5]	5	0	14	0	0	0	0	0	0
1952-53	0	0	0	0	0	0	8	0	12	0	0	0	0	0	0
1953-54	0	0	0	0	0	0	23	0	20[6]	0	0	0	0	0	0
1954-55	0	0	0	0	0	0	9	0	9	0	0	0	0	0	0
1955-56	0	0	0	0	0	0	26	0	9	0	0	0	0	0	0
1956-57	0	0	0	0	0	0	1	0	20	0	0	0	0	0	0
1957-58															
1958-59	0	0	0	0	0	0	20	0	20	0	0	0	0	0	0
1959-60	0	0	0	0	0	0	24	0	16	0	0	3	0	0	0
1960-61	0	0	0	0	0	0	10	0	20	0	0	25	0	0	0
1961-62	0	0	0	0	0	0	0	0	20	0	0		0	3	0
1962-63	0	0	4	0	0	50	0	0	15	0	0	25		2	0
1966-67	0	20	0	0	0	181		0		0	0	10	100	0	0
1968-69	0		0	0	0	175	0	0	0	0	0		75	0	0
1969-70	0		0	0	0	150	A	A		0	0		100	0	0
1972-73						115[2]									
1973-74						200[2]									
1974-75						180[2]									
1975-76	0		0	0	0	495	0	30	20	0	0	25	25	0	0
1976-77															
1977-78	0	1	0	0	0	272	0	10	64	0	0	20	42	A	0
1978-79	0	5	0	A	0	591	0	33	64	0	0	68	85		0
1979-80						300[7]									
1980-81															
1984-85		0	12	3	20	170	0		77	0	0	27	8	0	0
1985-86		0	19	5	4	184	0		118	0	4	0	7	0	0
1986-87	8	0	6	6	0	158	0	21	99	0	2	8	9	0	0
1987-88	9	0	28	10	9	110	0	21	75	0	2	19	0	0	0
1988-89	15	0	13	39	50	153	0	43	25	0	0	1	6	0	0
1989-90	34	0	18	17	36	113	0	39	28	0	0	8	8	0	5
1990-91	35	0	19	25	30	113	0	39	60	0	0	7	4	0	8
1991-92	24	0	47	25	36	172	0	59	66	0	0	0	9	0	8
1992-93						102									
1994-95						100			4						
1995-96						100			0	100					
1996-97						92			0	54					
1997-98						95			0	8		26			
1998-99	11	0	23	7	39	60	0	19	9	9	0	0	0	0	2

[4]Eifler field notes.

[5]Nests on Little Tern Key. R. P. Allen. The present status of the Roseate Spoonbill, a summary of events 1943-63. Unpublished report, National Audubon Society Research Center, Tavernier FL.

[6]Porjoe colony disrupted by humans and abandoned early in nesting. R. P. Allen. The present status of the Roseate Spoonbill, a summary of events 1943-63. Unpublished report, National Audubon Society, Tavernier FL.

[7]William B. Robertson notes

Table H.2 Summary of spoonbill foraging habitat lost to dredge-and-fill urban development in the Upper Florida Keys. Only developments that resulted in a loss of 5 acres or more are included.

Decade	Spoonbill Colony Group Impacted	% Loss of 1955 Foraging Habitat	Name of Development	Location	Approximate Construction (nesting year impacted)	Estimated Foraging Acres Filled
			Tollgate Shores/Seabase/ Safety Harbor	Southern Lower Matecumbe Key	1955	77
1955-1965	Southeast	28%	Boatman's Colony	Northern Plantation Key	1955	7
			*Indian Waterways	Northern Plantation Key	1958 (1958-59)	65
			*Plantation Key Colony	Northern Plantation Key	1959 (1959-60)	90
			*Tropical Atlantic Shores	Northern Plantation Key	1959 (1959-60)	18
			Holiday Isle Resort	Southern Windley Key	1958-1959	15
			Venetian Shores (phase 1)	Southern Plantation Key	1959-1960	12
			Key Heights	Southern Plantation Key	1960	5
	Southwest	9%	Fiesta Key Campground	Fiesta Key	1955-56	11
			Layton	Long Key	1955-56	10
			Tollgate Shores/ Safety Harbor	Southern Lower Matecumbe Key	1955	77
			*Matecumbe Sand Beach/ White Marlin Beach	Southern Lower Matecumbe Key	1958-59	44
			Davis Shores	Northern Lower Matecumbe	1959-60	9
1965-1975	Southeast	7%	Venetian Shores (phase 2)	Southern Plantation Key	1965-72	13
			*Hammer Point	Southern Key Largo	1971-72 (1971-72)	71
			*Tavernier Town Shopping Center	Southern Key Largo	1971-72 (1971-72)	10
			Tavernier Creek/ Tavernaero	Northern Plantation Key	1971-72	20
	Southwest	6%	*Port Antigua (central region)	Southern Lower Matecumbe Key	1971-72 (1971-72)	134

*Important Roseate Spoonbill foraging sites as reported by Robert Porter Allen (notes), Jack Watson (notes) and Alexander Sprunt IV (pers. comm.).

Table H.3 Results of flight line surveys for the southeast, northeast and northwest colony groups (1957-1999).

	Year	Colony	# of Dates	# of Hours	Total Nests	Total Flights	Flight Direction (Percent Total Flights) N	NE	E	SE	S	SW	W	NW
SOUTHEAST[1]														
	1957-58	Cowpens	6	8	40	260	3	7	48	30	2	1	0	9
	1957-58	Stake	1	1	?	19	11	0	58	0	32	0	0	0
	1958-59	Bottle	2	2	5	18	22	6	11	22	11	22	6	0
	1958-59	Cowpens	6	9.3	75	660	7	24	52	5	2	3	3	3
	1958-59	Stake	1	1	5	11	9	0	45	9	0	0	18	18
	1960-61	Cowpens	6	8.8	70	804	17	36	25	8	3	1	8	2
	1961-62	Cowpens	7	6.8	50	417	24	15	27	6	9	1	13	6
	1962-63	Cowpens	8	8	75	678	10	20	22	9	0	5	23	12
Total	5	3	37	45	320	2867	13	23	33	9	3	3	10	6
NORTHEAST[2]														
	1958-59[1]	N. Nest	1	1	20	35	31	31	23	14	0	0	0	0
	1973-74	Tern	1	1.2	200	203	0	90	5	0	0	0	5	0
	1975-76	Tern	1	1	495	212	33	33	0	0	0	0	0	33
	1976-77	Porjoe	1	1	?	62	3	30	41	0	0	0	25	0
	1976-77	Tern	2	2	?	245	25	50	14	0	0	0	5	7
	1977-78	Porjoe	3	3.3	64	101	27	42	20	5	0	0	4	3
	1977-78	Tern	4	4	272	422	18	37	3	0	3	1	6	32
	1978-79	Porjoe	4	8	64	241	22	43	17	7	0	3	2	5
	1978-79	Tern	6	9	591	1545	12	58	8	0	1	1	7	14
	1998-99[3]	Tern	2	1.5	60	62	0	0	0	0	0	0	0	100
Total	7	3	25	32	1766	3129	15	51	11	1	1	1	6	14
NORTHWEST[2]														
	1977-78	Frank	1	1	36	12	33	0	0	0	0	0	0	67
	1977-78	Oyster	1	1	56	6	52	30	0	0	0	0	0	18
	1978-79	Frank	2	4.5	62	49	38	13	2	0	0	0	4	42
	1978-79	Oyster	4	7.8	64	213	21	19	5	0	0	1	3	50
	1978-79	Sandy	1	2	80	66	41	33	0	0	0	0	0	26
Total	2	3	9	16	298	345	28	21	3	0	0	1	2	44

[1]Robert Porter Allen field notes
[2]William B. Robertson and JCO field notes unless otherwise noted
[3]JJL field notes

Table H.4 Estimated annual Roseate Spoonbill production (number of chicks per nest) for southeastern (SE) and southwestern (SW), nesting sub-regions before and after major development of the upper Florida Keys. For some years numerical estimates were not calculated but observations indicated success or failure in nesting. In such cases 'S' indicates successful nesting (greater than 1 chick per nest) and 'F' indicates failed nesting (less than 1 chick per nest).

Pre-Development	Estimated Chicks per Nest	
Year	**SE**	**SW**
1950-51	2.7	
1951-52	2.5	
1952-53	1.9	
1953-54	2.0	
1954-55	1.7	
1955-56	2.5	
1956-57	1.0	
1957-58	3.0	
1958-59	2.7	
1959-60	2.5	
1960-61	2.5	
1961-62	2.0	
1962-63	2.0	
1964-65		S
1965-66	S	
1966-67	2.6	2.1
1968-69		2.2
Mean	2.25	2.15
%Success	100	100

Post-Development	Estimated Chicks per Nest	
Year	**SE**	**SW**
1974-75	S	S
1975-76		F
1977-78	F	0.21
1978-79	0.3	0.2
1979-80	0	
1981-82	S	S
1982-83	F	F
1983-84	F	F
1986-87	F	F
1998-99	0.4	
Mean	0.22	0.23
%Success	22	25

Table H.5 Estimated annual Roseate Spoonbill production (number of chicks per nest) for the northeastern (NE) and northwestern (NW) sub-regions before and after the major structural and operational changes in the South Dade Conveyance System that occurred in 1982. For some years numerical estimates were not calculated but observations indicated success or failure in nesting. In such cases 'S' indicates successful nesting (greater than 1 chick per nest) and 'F' indicates failed nesting (less than 1 chick per nest).

PERIOD 2	Est. Chicks Per Nest		% Deviation from Mean Rainfall	
Year	NE	NW	Wet	Dry
1964-65	S		-0.03	-0.27
1965-66	**S**		**0.07**	0.07
1966-67	**1.8**		**0.13**	-0.48
1967-68	**1.4**		**0.08**	-0.03
1968-69	**2.2**		**0.27**	0.07
1969-70	**2.0**		**0.24**	0.62
1971-72	**2.0**		**0.05**	0.13
1973-74	**1.6**	S	**0.02**	-0.34
1974-75	**2.2**	S	**0.12**	-0.25
1975-76	0.8	0.5	-0.02	-0.07
1977-78	0	F	-0.04	0.12
1978-79	0.6	0.5	-0.05	0.27
1979-80	0.5		-0.05	0.15
1981-82	S	S	-0.21	-0.44
Mean	1.38	0.48	0.04	-0.03
%Success	71	50		

PERIOD 3	Est. Chicks Per Nest		% Deviation from Mean Rainfall	
Year	NE	NW	Wet	Dry
1982-83	0.0	S	0.14	0.42
1983-84	0.5		0.05	0.32
1986-87	0.0	0.0	-0.02	0.14
1987-88	**1.2**	2.5	**-0.02**	**-0.21**
1988-89	**1.9**	1.9	**-0.16**	**-0.29**
1989-90	**2.2**	2.4	**-0.16**	**-0.18**
1990-91	**1.8**	2.1	**-0.10**	**0.40**
1991-92	**1.3**	2.0	**-0.01**	**-0.29**
1992-93	0.0	0.0	0.16	0.22
1994-95	0.0	1.6	0.21	0.16
1995-96	0.1	0.1	0.33	0.08
1996-97	0.2	0.4	-0.15	0.03
1997-98	0.0	0.4	0.00	0.48
1998-99	0.3	1.4	0.02	-0.38
Mean	0.67	1.24	0.02	0.06
%Success	36	62		

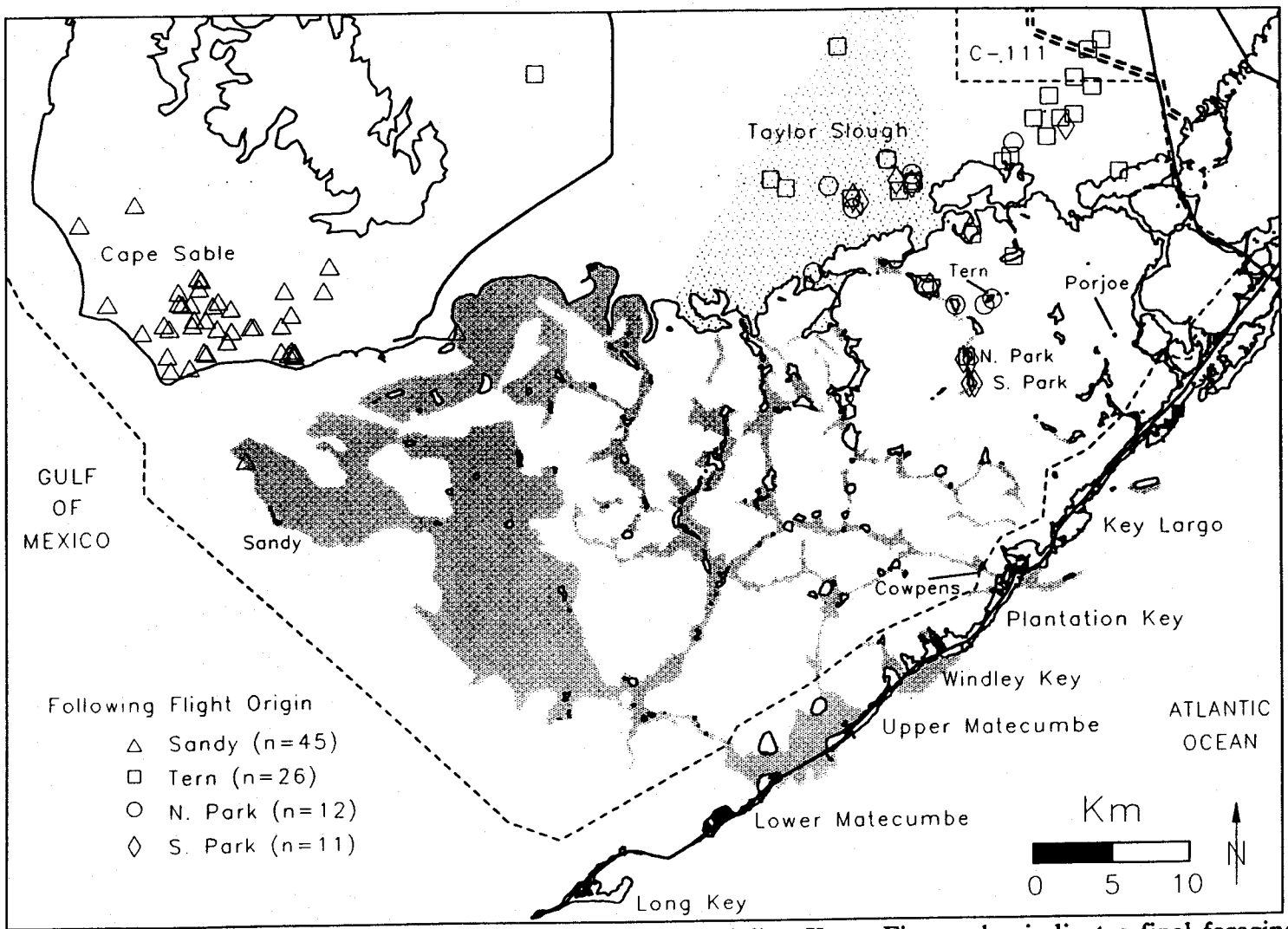


Figure H.1. Map of Florida Bay, southern mainland and mainline Keys. Figure also indicates final foraging location of 94 Roseate Spoonbills followed by fixed-wing aircraft from four colonies in 1989.

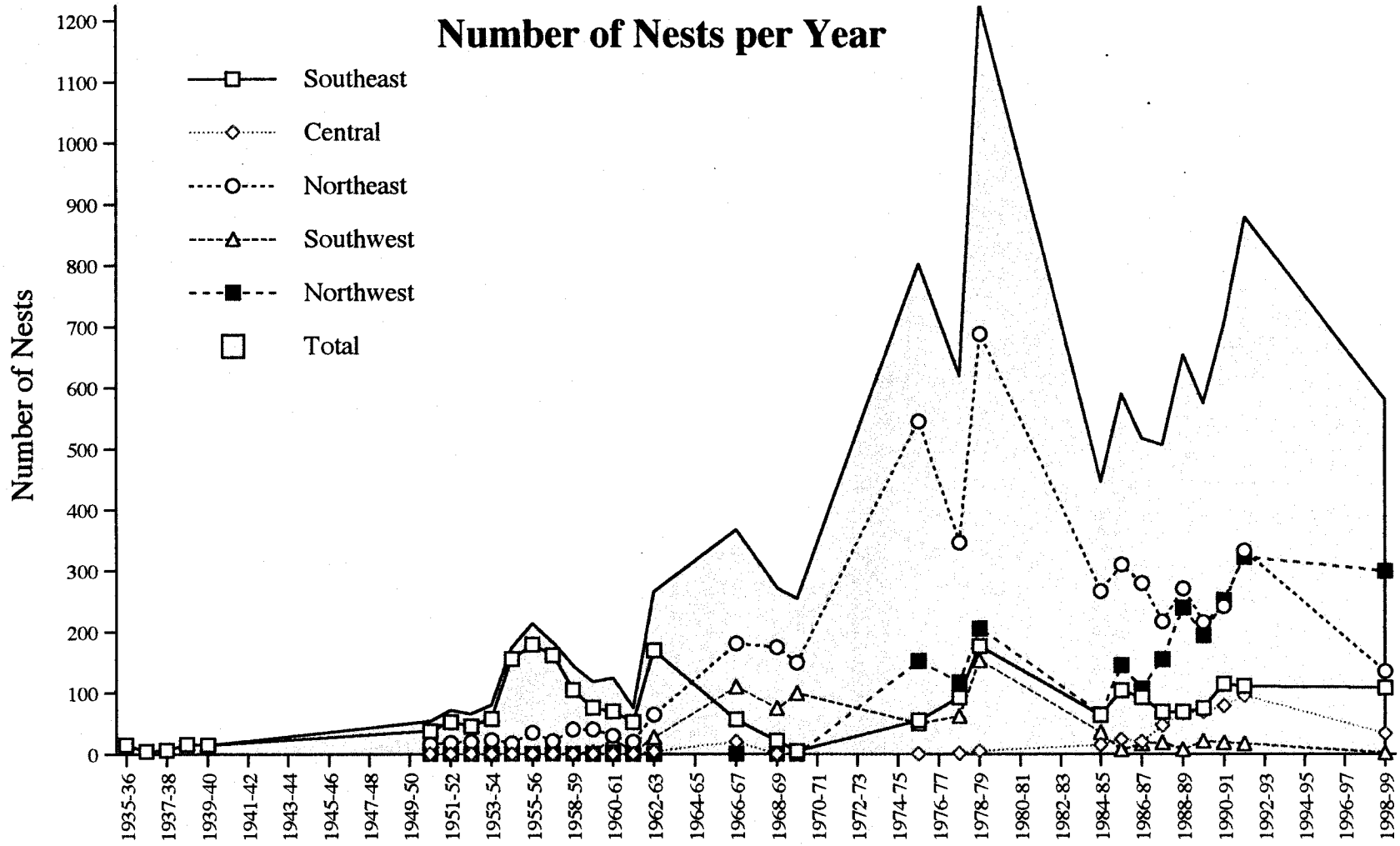


Figure H.2 Total Number of Roseate Spoonbills in Florida Bay from 1935 to 1999. Number of nests per colony group are also indicated for each year.

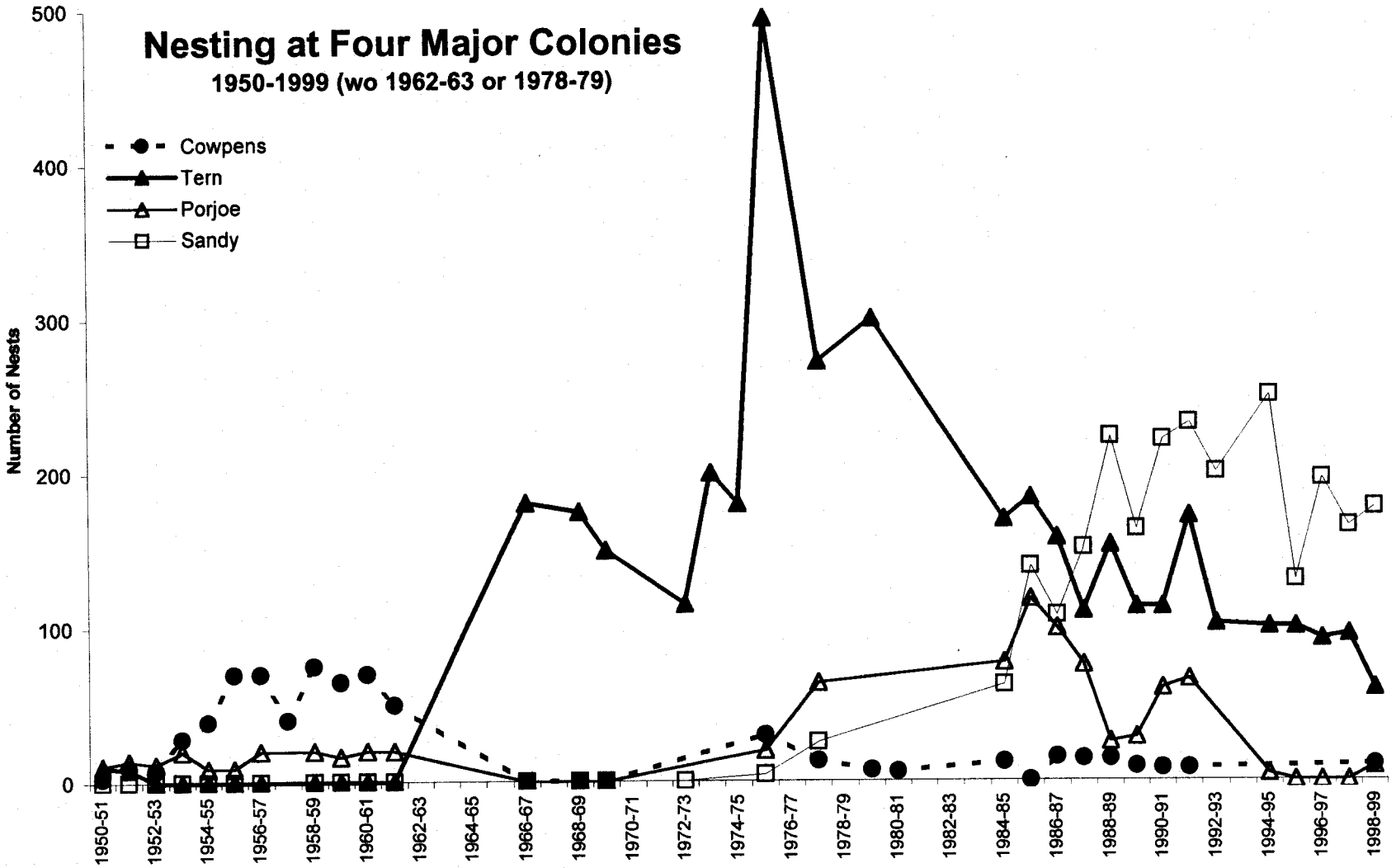


Figure H.3 Nesting record at cowpens, Tern Porjoe and Sandy key colonies for the period 1950-1999

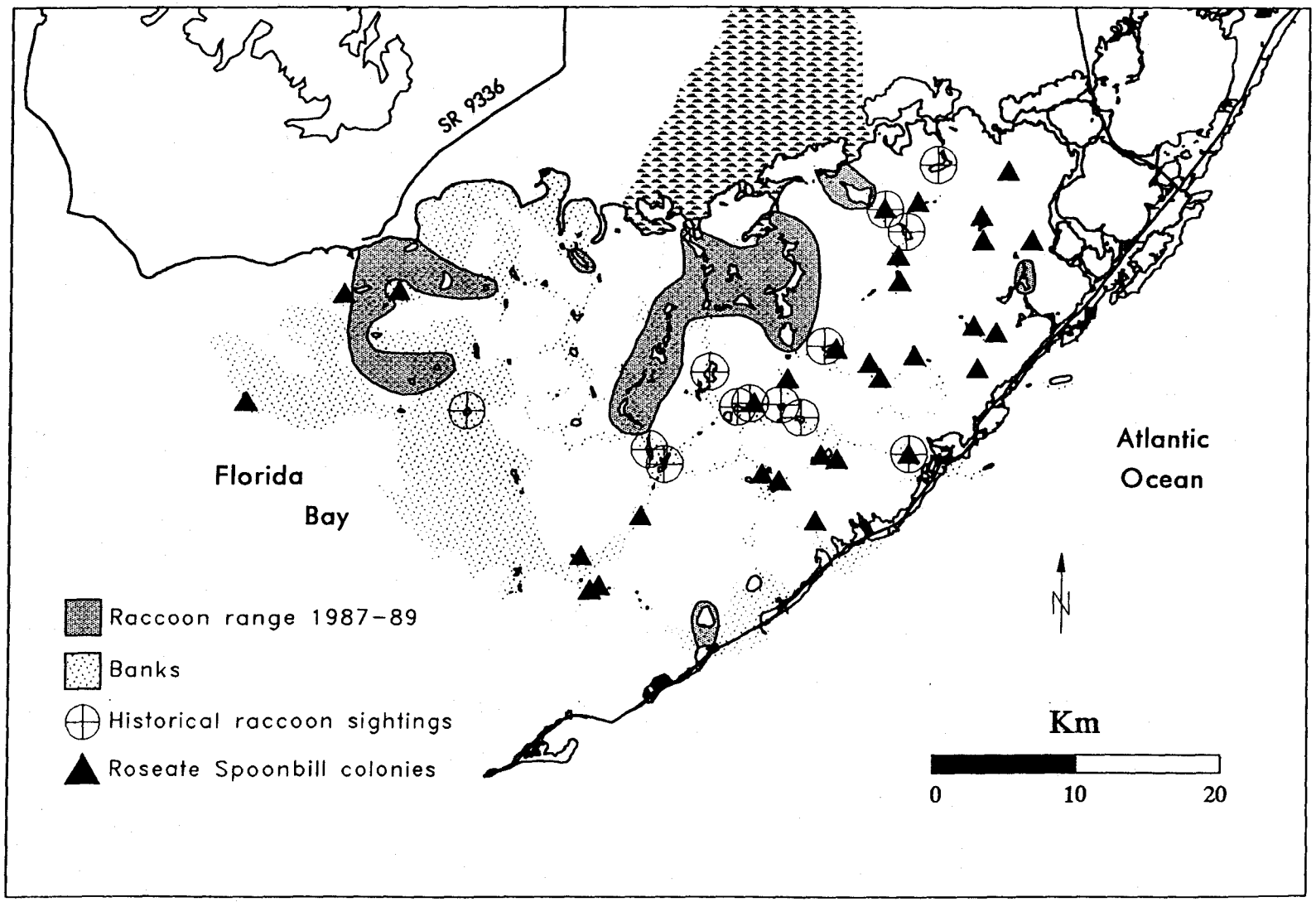


Figure H.4. Location of all spoonbill nesting sites from 1935 through 1999 and the distribution of raccoons in Florida Bay between 1987 and 1989. Keys reported to have had resident raccoons prior to 1987 and after 1989 also indicated.

Figure H.5 Rings around each spoonbill colony indicate the mean flight distance (12.4 km) of foraging spoonbills based on 1989 following flights. Flight distance suggests that colonies can be separated into colony groups based on likely foraging locations. A. The southeastern colony group likely foraged on Plantation Key and adjacent areas. B. The southwestern colony group foraged in the vicinity of Lower Matecumbe Key and northeastern colony group likely foraged on the mainland between Taylor Slough and Barnes Sound. C. The northwestern colony group were in proximity to foraging grounds on Cape Sable and central colony group may have foraged widely within the bay including both mainland and mainline Keys habitats.

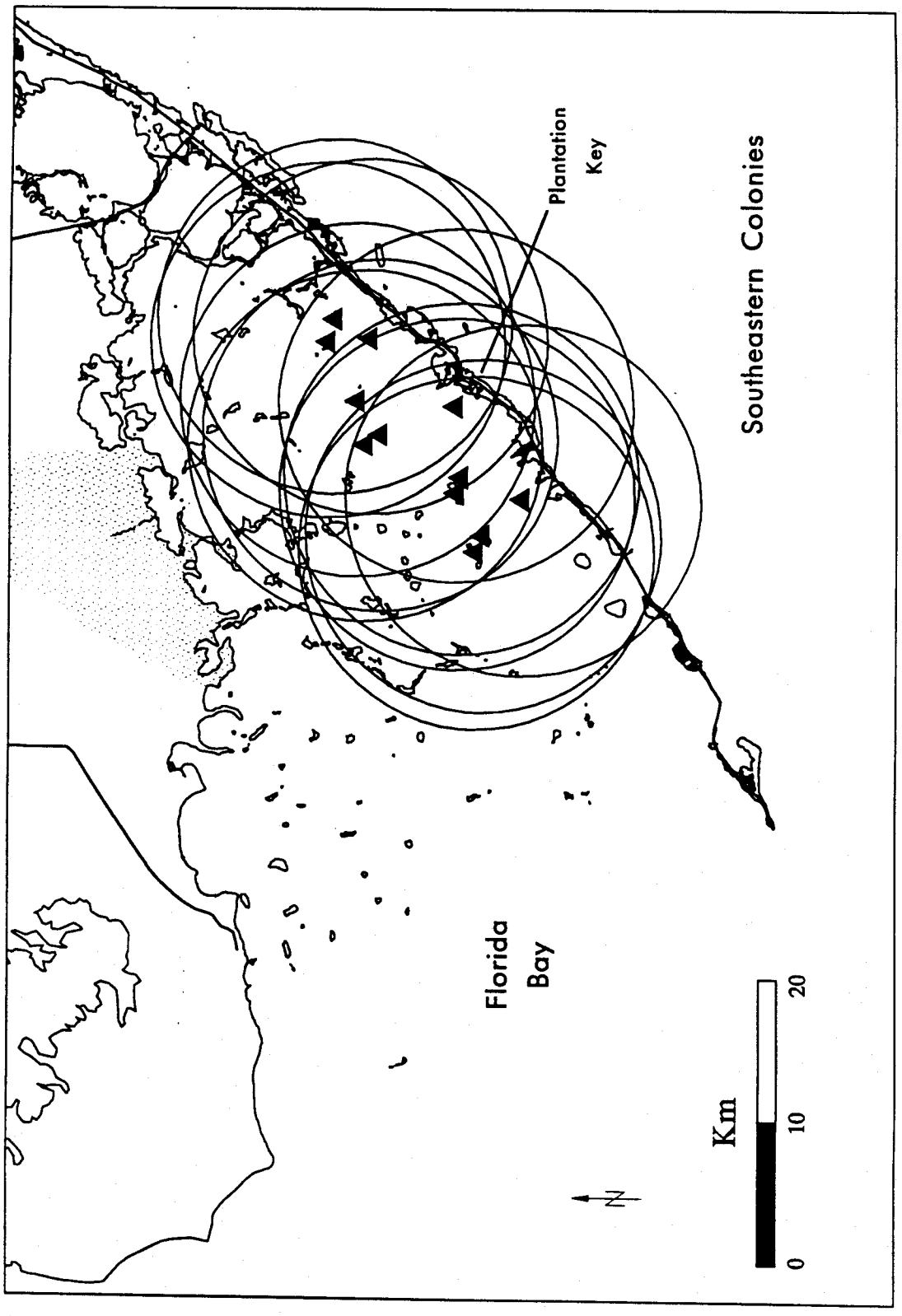

Southeastern Colonies
Plantation Key
Florida Bay
Km
0
10
20
N

Figure H.5A

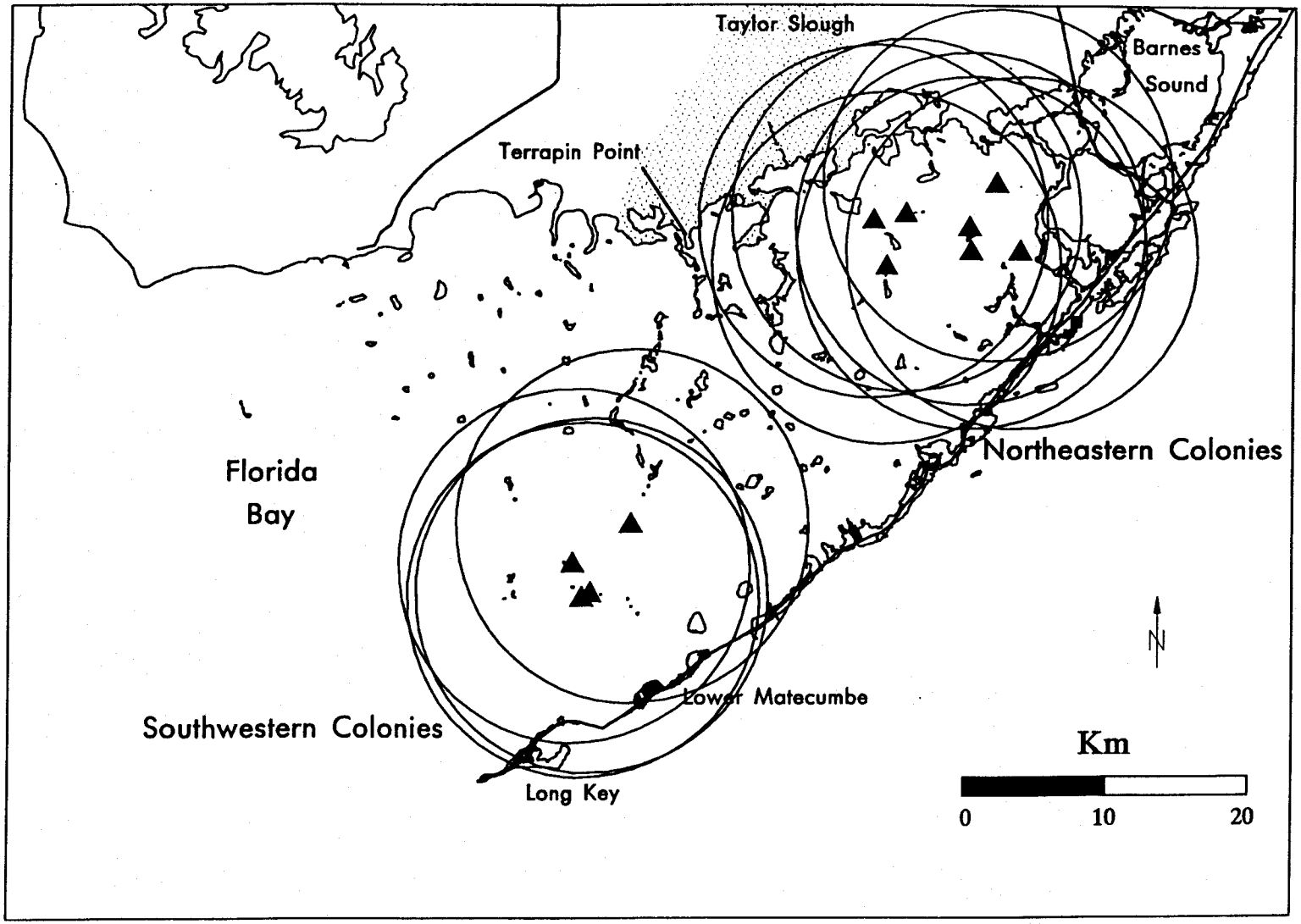

Taylor Slough
Barnes
Sound
Terrapin Point
Florida
Bay
Northeastern Colonies
Lower Matecumbe
Southwestern Colonies
Long Key
N
Km
0
10
20

Figure H.5B

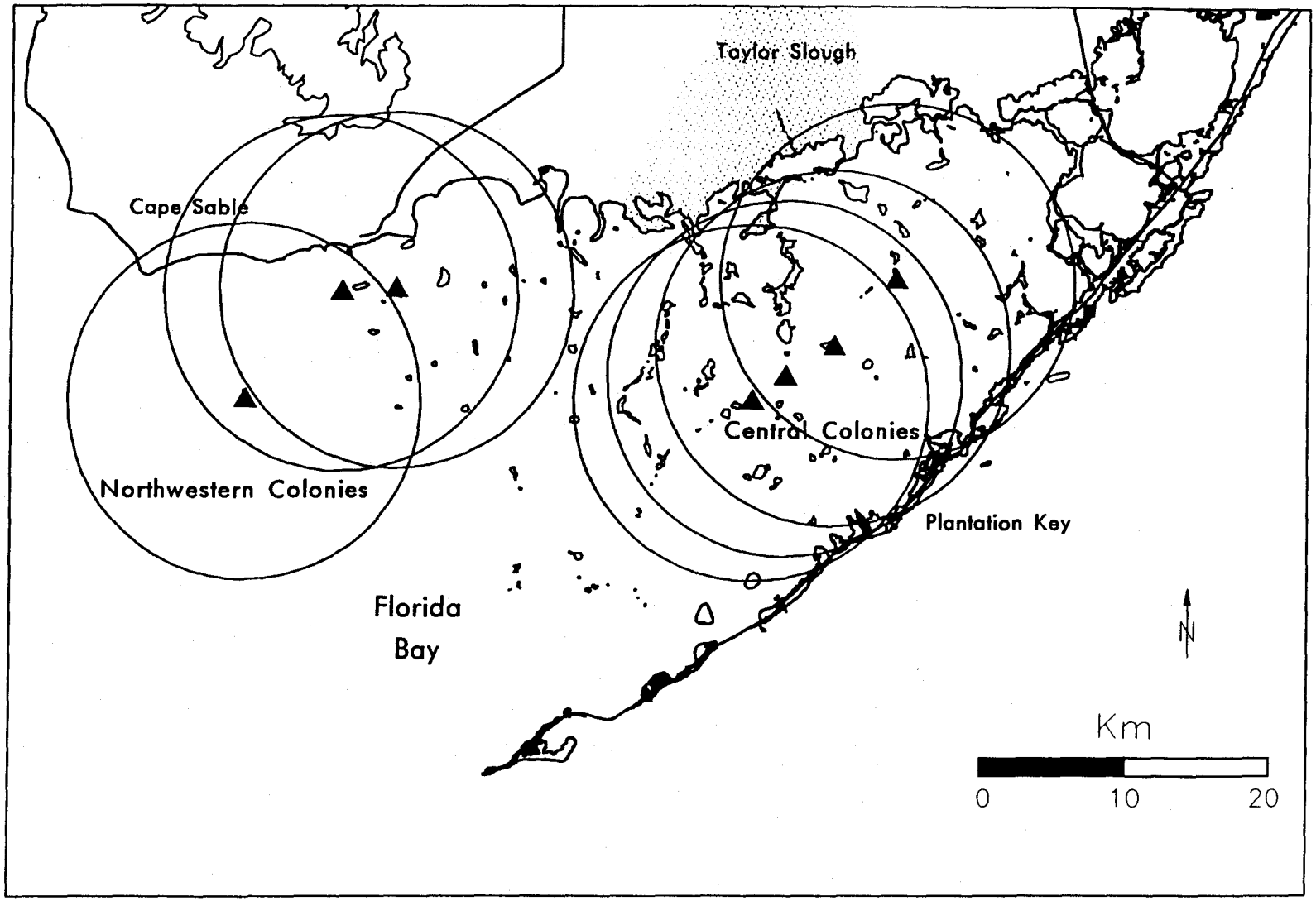

Taylor Slough
Cape Sable
Northwestern Colonies
Central Colonies
Plantation Key
Florida
Bay
N
Km
0
10
20

Figure H.5C

Figure H.6 A. Percent of total spoonbill nests found in each colony group between 1950 and 1999. B. Mean nest location within Florida Bay. Diamond indicates mean and error bars indicate the standard deviation on both the longitudinal and latitudinal axes. Intervals are approximately 10 years. In 1935-36, all nests were located at the Bottle Key colony so there was no variance in nesting location. No surveys were performed in the 1940's. No survey was made within a year of 1964-65 so both the 1962-63 and 1966-67 means were plotted. No survey was made within a year of 1994-95 so both the 1990-91 and 1998-99 mean were plotted.

Nesting Percent by Region
1950-1999
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
1950-51
1952-53
1954-55
1956-57
1958-59
1960-61
1962-63
1964-65
1966-67
1968-69
1970-71
1972-73
1974-75
1976-77
1978-79
1980-81
1982-83
1984-85
1986-87
1988-89
1990-91
1992-93
1994-95
1996-97
1998-99
SE
Central
NE
SW
NW

Figure H.6A

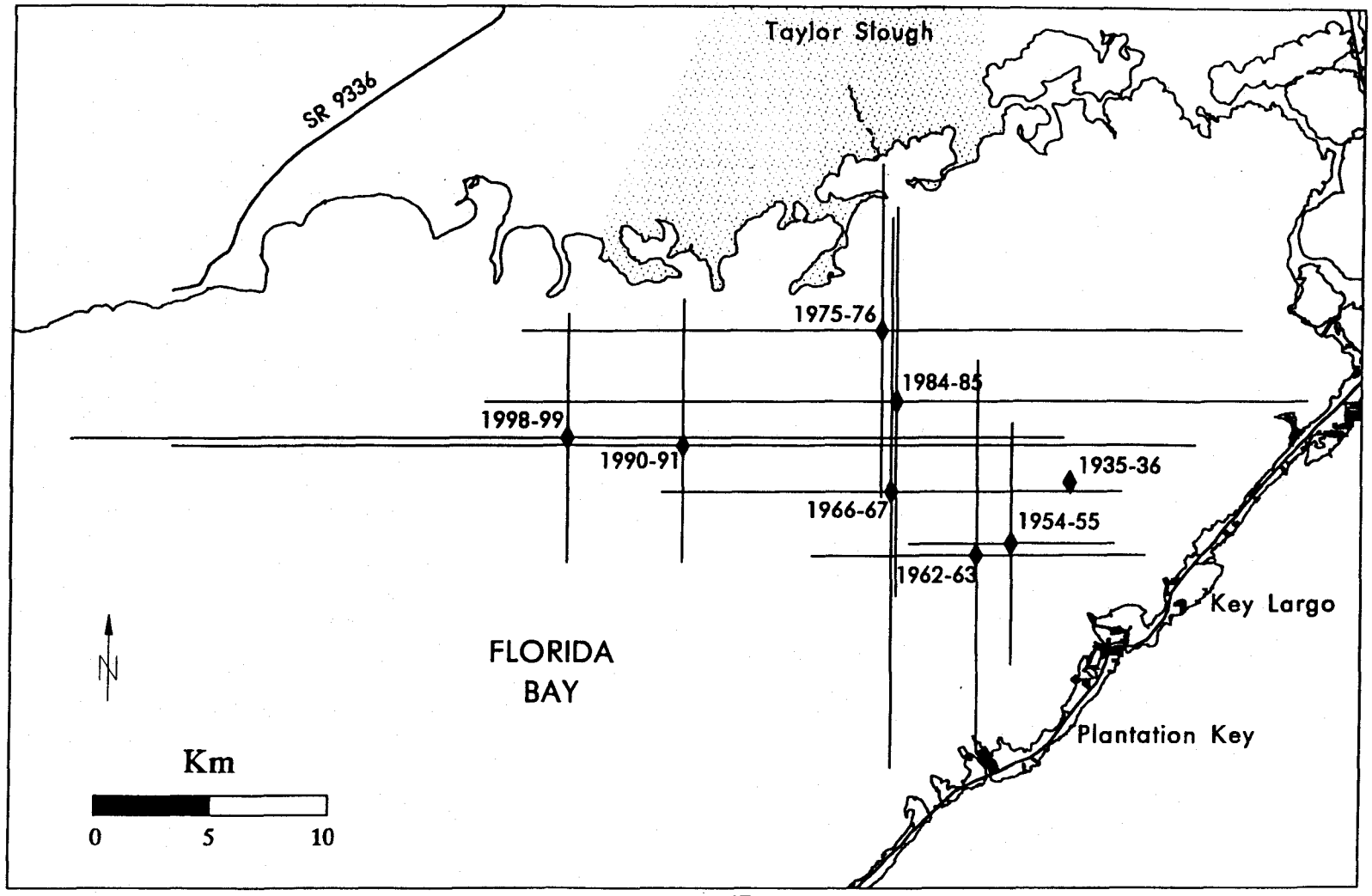

Taylor Slough
SR 9336
1975-76
1984-85
1998-99
1990-91
1935-36
1966-67
1954-55
1962-63
Key Largo
FLORIDA
BAY
Plantation Key
N
Km
0
5
10

Figure H.6B

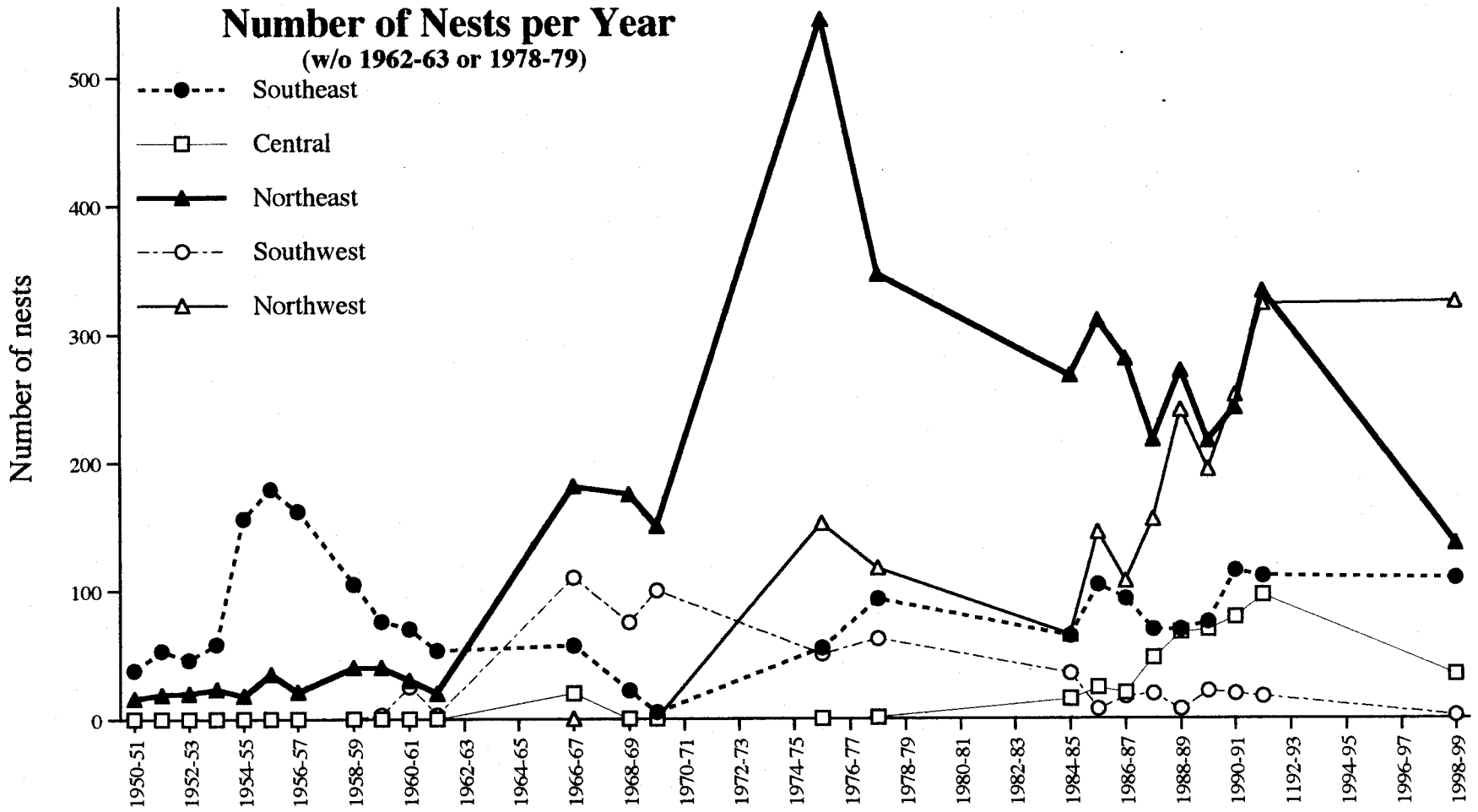


Figure H.7 Number of nests per year by colony group from 1950-to 1999. The 1962-63 and 1978-79 nesting years have been removed so that regional trends are more visually clear (see text for justification)

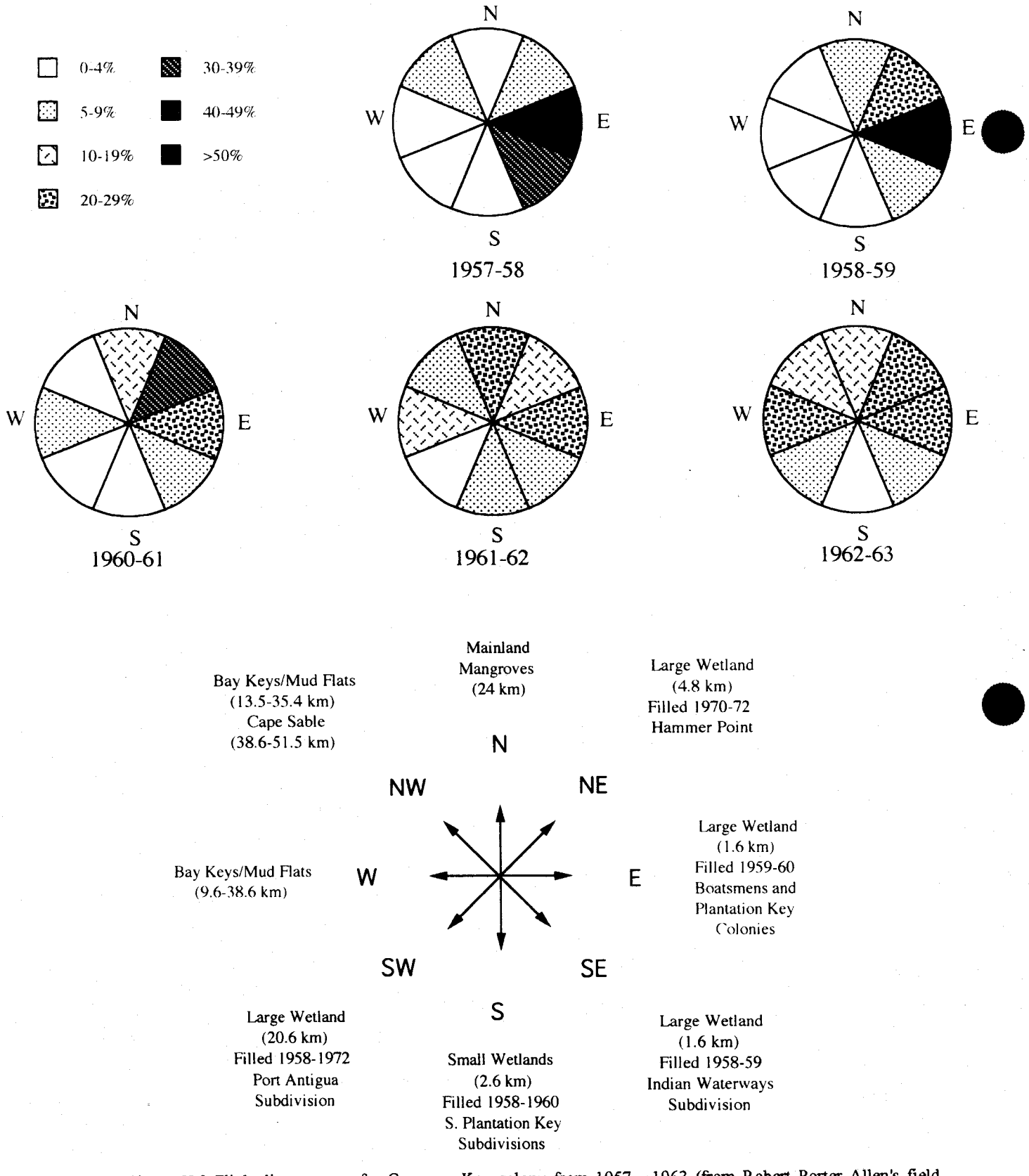


Figure H.8 Flight line surveys for Cowpens Key colony from 1957 - 1963 (from Robert Porter Allen's field notes). Pie charts summarize the percentage of flights toward eight compass headings (see Table 3 for details about flight line surveys). Rosetta indicates nearest foraging location and approximate distance to that location in parentheses. Also indicates timing of dredge-and-fill urban development at specific locations on the mainline Keys (see Table H.2 for specifics about dredge and fill developments).

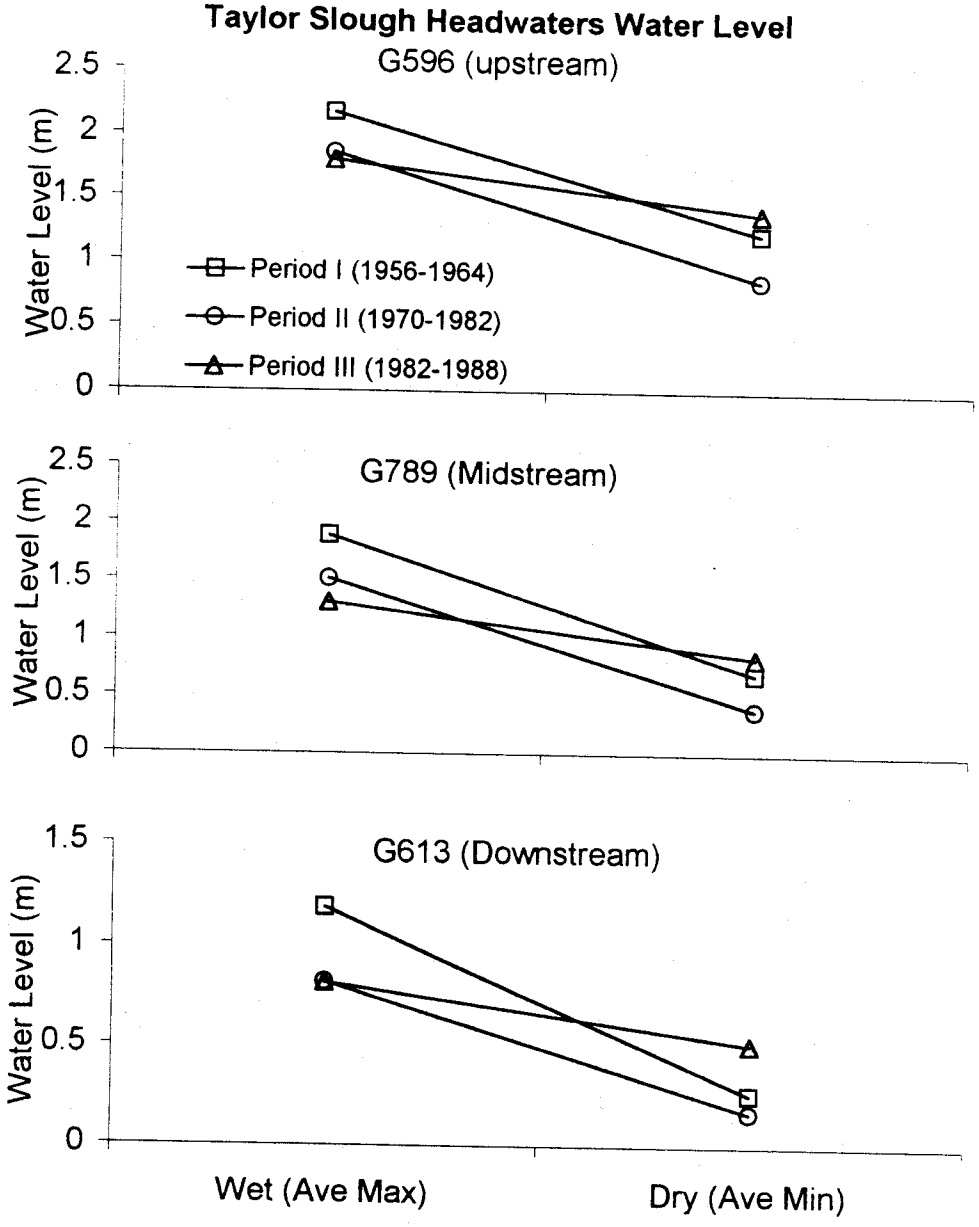


Figure H.9 Changes in water level in the Taylor Slough headwaters (from Johnson and Fennema 1989). Period I was prior to significant water management impacts in the Taylor Slough region. Period II: completion of C-111 and associated canals and Minimum Schedule of Water Deliveries management regime. Period III: completion of the South Dade Conveyance System (1982) and Experimental Program of Water Deliveries management regime (1984).

Organization of Tables in Appendix I.

Appendix I provides tables which summarize each visual survey of submerged aquatic vegetation (SAV). This appendix is organized by site with the sites presented in alpha-numerical order (Collection site BS-1 is the first Table followed by BS-2, BS-3, BS-4 and then HC-1). Each site table is organized chronologically by column A ('Date') with each row representing the summary of SAV data collected on that date. Physical data are presented in the next 3 columns with 'Depth' being the average depth for the quadrats sampled. 'Secchi' is a measure of water clarity based on the Secchi Disk reading. 'Sal' is the salinity measured at the site with a refractometer. In the remainder of the columns, the mean and standard error (SE) percent cover are provided for all SAV combined ('Total') and for each species. The abbreviations used for species are provided in the list below (generally the abbreviations are the first three letters of the genus and species separated by a space). SAV species are characterized into freshwater, euryhaline and marine species and species are organized into these generalized groups (Row 1). Numbers presented in bold italics are estimates that were collected using the percent cover technique but were not converted to point-intercept because to few samples were collected to generate a significant regression model.

Species List

UTR SP	Utricularia sp.
UTR GIB	Utricularia gibba
CHA HOR	Chara hornemanii
NAJ MAR	Najas marina
RUP MAR	Ruppia maritima
BAT OER	Batophora oerstedi
CLA SP	Cladophora sp.
HAL WRI	Halodule wrightii
ACE CAL	Acetabularia calyculus
NIT SP	Nitella sp.
THA TES	Thalassia testudinum
LAU INT	Laurencia intricata
LAU POI	Laurencia poitei
LAU OBT	Laurencia obtusa
PEN CAP	Penicillus capitatus
HAL INC	Halimeda incrassata
SAR SP	Sargassum sp.
HYP SP	Hypnea sp.
ULV SP	Ulva sp.
CHO SP	Chondria sp.
UNK A	Unidentified filamentous green algae
UNK B	Unidentified filamentous red algae

Barnes Sound:Mean and Standard Error (SE) for Submerged Macrophytes at BS-1

						EURYHALINE										MARINE																	
Date	Depth	Secchi	Sal	Total		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES		HAL INC		LAU INT		PEN CAP		SAR SP		UNK B		LAU POI		ULV SP	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
Jun-96	ns	bottom	ns	88.06	5.15	10.34	2.61	0.00	0.00	0.00	0.00	38.43	5.49	66.60	9.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	bottom	ns	88.52	3.73	75.95	5.20	4.76	1.60	0.00	0.00	0.44	0.20	55.10	5.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May-97	57.5	bottom	32	79.03	5.87	23.39	3.94	1.47	0.60	0.00	0.00	7.62	2.66	62.81	9.92	***0.10***	***0.13***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oct-97	52.5	bottom	1.5	72.48	6.05	13.04	1.75	24.88	6.02	0.00	0.00	0.40	0.20	47.76	7.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	32.5	bottom	11	78.24	6.27	47.52	6.49	28.00	5.87	0.00	0.00	0.88	0.38	41.12	6.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Feb-98	52.5	bottom	24	74.48	5.55	26.16	4.55	7.84	2.40	0.00	0.00	0.56	0.36	58.48	7.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	25	bottom	5	74.56	6.19	3.68	0.88	10.16	3.31	0.24	0.18	2.00	1.46	64.40	8.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	29	bottom	30	66.08	6.40	12.16	1.97	8.48	1.79	0.00	0.00	2.24	1.22	50.72	8.66	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	25	bottom	36	74.33	5.94	13.17	5.52	23.83	7.43	0.00	0.00	2.50	1.31	42.17	11.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	38	bottom	31	69.50	9.89	35.17	7.42	1.83	0.76	0.00	0.00	2.83	1.49	52.17	12.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	36	bottom	3	41.50	9.40	24.00	7.25	11.83	5.80	0.00	0.00	2.83	1.49	19.00	9.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	27	bottom	3	53.33	9.94	25.67	7.26	2.00	1.02	0.00	0.00	6.67	3.88	32.67	11.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	38	bottom	15	52.33	11.66	26.00	7.29	3.17	1.27	0.00	0.00	5.50	2.78	38.33	12.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	40	bottom	30	63.67	8.55	19.17	6.74	11.67	5.64	0.67	0.67	11.17	3.65	42.67	12.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Barnes Sound:Mean and Standard Error (SE) for Submerged Macrophytes at BS-2

						EURYHALINE														MARINE													
Date	Depth	Secchi	Sal	Total		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES		HAL INC		LAU INT		PEN CAP		SAR SP		UNK B		LAU POI		ULV SP	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
Jun-96	ns	ns	ns	50.98	5.34	7.78	2.85	0.00	0.00	0.00	0.00	10.64	5.97	0.00	0.00	0.00	0.00	0.00	0.00	36.32	5.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	ns	ns	66.47	5.68	16.07	2.14	0.00	0.00	0.00	0.00	32.40	6.81	0.14	0.14	0.00	0.00	0.00	0.00	42.55	5.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May-97	50	bottom	33	78.16	4.81	58.02	5.06	0.00	0.00	0.00	0.00	11.17	4.25	0.00	0.00	***0.30***	***0.17***	0.00	0.00	25.55	3.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***0.30***	***0.17***	0.00	0.00	0.00	0.00
Sep-97	45	bottom	3	57.80	5.94	38.90	6.06	0.00	0.00	0.00	0.00	13.30	3.63	0.40	0.40	0.00	0.00	0.00	0.00	22.60	3.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	27.5	bottom	15	79.20	5.43	52.80	7.15	0.00	0.00	0.00	0.00	9.47	2.74	0.80	0.80	0.00	0.00	0.00	0.00	25.07	5.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Feb-98	49	bottom	24	41.87	6.23	1.60	0.49	0.00	0.00	0.00	0.00	9.73	2.49	8.00	6.70	0.00	0.00	0.00	0.00	24.27	5.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	27	bottom	7	27.73	5.47	0.67	0.32	0.00	0.00	0.00	0.00	13.60	4.57	0.00	0.00	0.00	0.00	0.00	0.00	14.67	2.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	45	bottom	28	44.53	8.13	6.27	1.74	0.00	0.00	0.00	0.00	20.93	7.12	3.20	3.20	0.00	0.00	0.00	0.00	17.73	4.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.87	0.95	0.00	0.00	0.00	0.00
Jun-98	30	bottom	30	56.33	7.11	18.83	5.91	0.00	0.00	0.00	0.00	19.67	6.99	0.17	0.17	0.17	0.17	0.00	0.00	27.17	5.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	45	bottom	28	69.67	6.58	22.17	5.55	0.00	0.00	0.00	0.00	27.83	7.57	0.00	0.00	0.00	0.00	0.00	0.00	30.67	5.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	30	bottom	5	49.83	7.98	8.00	2.30	0.00	0.00	0.00	0.00	24.00	6.84	3.33	2.64	0.00	0.00	0.00	0.00	28.00	6.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	26	bottom	8	51.00	5.49	6.00	1.48	0.00	0.00	0.00	0.00	34.00	7.11	0.67	0.45	0.00	0.00	0.00	0.00	17.17	4.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	42	bottom	22	48.33	6.79	2.17	0.39	0.00	0.00	0.00	0.00	31.50	8.31	0.00	0.00	0.00	0.00	0.00	0.00	18.17	3.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.72	0.00	0.00	0.00	0.00
Mar-99	35	bottom	30	46.33	7.81	3.17	0.72	0.00	0.00	0.00	0.00	32.33	9.36	0.00	0.00	0.67	0.38	0.00	0.00	14.17	4.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.00	0.00

Barnes Sound:Mean and Standard Error (SE) for Submerged Macrophytes at BS-3

						EURYHALINE										MARINE																	
Date	Depth	Secchi	Sal	Total		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES		HAL INC		LAU INT		PEN CAP		SAR SP		UNK B		LAU POI		ULV SP	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
Nov-96	ns	bottom	ns	86.30	4.16	2.62	0.83	0.00	0.00	0.00	0.00	40.06	7.17	0.00	0.00	0.00	0.00	0.00	0.00	71.42	7.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May-97	62.5	bottom	34	88.00	2.57	0.00	0.00	0.00	0.00	0.00	0.00	10.48	2.24	0.00	0.00	***0.40***	***0.20***	0.00	0.00	78.53	2.91	0.00	0.00	0.00	0.00	***0.10***	***0.13***	0.00	0.00	***9.50***	***1.29***	0.00	0.00	0.00	0.00
Sep-97	67.5	bottom	7	69.00	3.50	0.00	0.00	0.00	0.00	0.00	0.00	8.40	2.84	0.00	0.00	0.00	0.00	0.00	0.00	64.40	4.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	46.5	bottom	18	97.33	0.93	0.00	0.00	0.00	0.00	0.00	0.00	24.27	7.33	0.00	0.00	0.00	0.00	0.00	0.00	83.20	6.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.27	0.00	0.00
Feb-98	70	bottom	25	71.47	3.44	0.00	0.00	0.00	0.00	0.00	0.00	12.67	3.16	0.00	0.00	0.00	0.00	0.00	0.00	62.40	4.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	45	bottom	10	84.00	2.59	0.27	0.18	0.00	0.00	0.00	0.00	14.93	3.85	0.00	0.00	0.00	0.00	0.00	0.00	63.20	6.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.60	7.26	0.00	0.00	0.00	0.00
Apr-98	53	bottom	27	94.67	1.08	0.67	0.32	0.00	0.00	0.00	0.00	10.13	2.78	0.00	0.00	0.00	0.00	0.00	0.00	83.47	5.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.07	5.66	0.00	0.00	0.00	0.00
Jun-98	45	bottom	29	86.00	5.49	1.17	0.72	0.00	0.00	0.00	0.00	21.17	5.06	0.00	0.00	0.00	0.00	0.00	0.00	78.00	9.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.33	1.74	0.00	0.00	0.00	0.00
Jul-98	62	bottom	27	86.67	3.79	1.33	0.45	0.00	0.00	0.00	0.00	30.83	7.78	0.00	0.00	0.00	0.00	0.00	0.00	76.00	4.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	73	bottom	9	84.33	2.12	0.00	0.00	0.00	0.00	0.00	0.00	20.17	6.92	0.00	0.00	0.00	0.00	0.00	0.00	76.00	3.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.00
Dec-98	50	bottom	12	84.00	1.84	0.00	0.00	0.00	0.00	0.00	0.00	21.50	5.48	0.00	0.00	0.00	0.00	0.00	0.00	79.67	2.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.00
Jan-99	55	bottom	25	85.33	3.49	0.00	0.00	0.00	0.00	0.00	0.00	26.00	7.48	0.00	0.00	0.00	0.00	0.00	0.00	68.33	6.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	58	bottom	30	79.00	3.49	0.00	0.00	0.00	0.00	0.00	0.00	32.17	8.68	0.00	0.00	0.00	0.00	0.00	0.00	68.33	3.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Barnes Sound:Mean and Standard Error (SE) for Submerged Macrophytes at BS-4

						EURYHALINE														MARINE													
Date	Depth	Secchi	Sal	Total		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES		HAL INC		LAU INT		PEN CAP		SAR SP		UNK B		LAU POI		ULV SP	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
Jun-96	ns	bottom	ns	84.45	3.64	1.59	0.63	0.00	0.00	0.00	0.00	2.27	1.01	0.00	0.00	***0.83***	***0.31***	0.00	0.00	66.38	4.76	0.00	0.00	*	*	***0.17***	***0.17***	0.00	0.00	***30.67***	***7.17***	*	*	0.00	0.00
Nov-96	ns	ns	ns	88.80	5.64	0.00	0.00	0.00	0.00	0.00	0.00	9.11	2.75	0.00	0.00	0.00	0.00	0.00	0.00	79.19	7.86	0.00	0.00	0.00	0.00	***0.31***	***0.31***	0.00	0.00	***18.28***	***5.12***	***1.25***	***0.68***	0.00	0.00
May-97	62.5	bottom	35	50.69	3.42	2.90	0.55	0.00	0.00	0.00	0.00	0.33	0.18	0.00	0.00	***4.30***	***0.58***	0.00	0.00	28.12	1.22	***0.50***	***0.29***	***1.80***	***1.10***	***1.30***	***0.29***	0.00	0.00	0.00	0.00	***18.00***	***4.28***	0.00	0.00
Sep-97	97.5	bottom	22	54.20	3.80	2.90	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.23	0.00	0.00	33.20	2.05	2.20	0.71	17.80	3.69	5.10	1.12	0.40	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	84	bottom	23	60.53	4.68	2.27	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.21	0.00	0.00	42.67	2.64	1.73	0.83	2.80	1.07	3.73	0.75	0.00	0.00	0.00	0.00	8.93	2.60	0.00	0.00
Feb-98	105	bottom	26	74.40	5.29	2.40	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.18	0.00	0.00	32.27	5.21	0.53	0.31	34.00	9.41	4.67	1.21	0.00	0.00	0.00	0.00	8.80	1.74	0.00	0.00
Mar-98	75	bottom	19	47.20	5.08	1.87	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.33	0.00	0.00	29.60	3.40	0.80	0.38	9.47	3.67	6.80	2.63	0.00	0.00	0.00	0.00	4.13	2.32	0.13	0.13
Apr-98	85	bottom	27	45.33	4.20	2.80	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.40	0.68	0.00	0.00	29.33	3.11	0.53	0.31	1.07	0.43	3.33	0.57	0.00	0.00	0.00	0.00	12.00	5.26	0.27	0.27
Jun-98	90	bottom	29	54.67	4.27	9.83	5.72	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	4.33	1.30	0.00	0.00	36.00	4.00	1.67	0.73	0.00	0.00	2.50	0.61	0.00	0.00	0.83	0.46	7.00	2.35	0.00	0.00
Jul-98	107	bottom	28	42.00	4.66	3.33	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.17	0.67	0.00	0.00	34.00	4.79	1.50	0.44	0.00	0.00	2.83	0.58	0.00	0.00	0.33	0.33	5.33	2.43	0.00	0.00
Oct-98	93	bottom	19	29.00	2.75	0.67	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.26	0.00	0.00	27.67	3.09	1.00	0.46	1.17	0.46	2.33	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17
Dec-98	87	bottom	14	38.67	5.83	0.67	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.30	0.00	0.00	22.67	2.84	1.67	0.48	17.67	5.16	3.67	0.81	0.00	0.00	1.00	0.67	0.17	0.17	0.00	0.00
Jan-99	95	bottom	25	38.00	5.01	0.33	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.30	0.00	0.00	16.83	3.33	1.17	0.46	0.00	0.00	1.00	0.39	0.00	0.00	0.00	0.00	22.67	5.29	0.00	0.00
Mar-99	100	bottom	30	45.00	4.85	1.33	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.30	0.00	0.00	22.67	3.32	0.50	0.36	20.50	4.32	2.83	0.39	0.00	0.00	0.00	0.00	0.67	0.67	0.00	0.00

Highway Creek:Mean and Standard Error (SE) for Submerged Macrophytes at HC-1

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
Apr-96	20	bottom	13	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May-96	19	bottom	ns	0.50	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jul-96	ns	bottom	0	0.24	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Sep-96	ns	bottom	20	0.32	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.16	0.16	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oct-96	46	bottom	0	12.48	4.57	0.00	0.00	0.00	0.00	0.00	0.00	12.48	4.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	bottom	5	15.36	5.46	0.00	0.00	0.00	0.00	0.00	0.00	15.36	5.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-97	ns	bottom	0	6.86	2.95	0.00	0.00	0.00	0.00	0.00	0.00	6.86	2.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Feb-97	31	bottom	3.5	5.55	1.97	0.00	0.00	0.00	0.00	0.00	0.00	5.55	1.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Apr-97	25	bottom	20	0.20	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May-97	10	bottom	23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jun-97	50	bottom	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jul-97	40	bottom	1.5	1.64	1.64	0.00	0.00	0.00	0.00	0.00	0.00	1.64	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sep-97	50	bottom	2	58.83	8.76	0.08	0.08	0.00	0.00	0.00	0.00	37.67	7.64	0.75	0.29	29.00	6.78	0.00	0.00	0.00	0.00	0.25	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	47.5	bottom	2	28.56	5.97	0.24	0.13	0.00	0.00	0.00	0.00	25.04	5.73	1.76	0.55	2.96	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	25	bottom	0	21.76	5.48	0.00	0.00	0.08	0.08	1.92	0.82	11.04	3.28	2.24	0.59	8.72	3.19	0.00	0.00	0.00	0.00	0.16	0.16	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	25	bottom	0	6.80	2.38	0.00	0.00	0.08	0.08	0.16	0.16	2.16	1.91	2.40	0.61	3.12	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	15	bottom	1	6.87	2.41	0.00	0.00	0.09	0.09	0.00	0.00	3.65	1.78	1.57	0.35	1.91	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	22	bottom	2	8.50	3.09	0.00	0.00	0.00	0.00	0.33	0.22	1.17	0.72	3.17	1.68	4.50	2.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	24	bottom	13	5.17	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	2.17	1.11	3.00	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sep-98	ns	bottom	1	9.17	3.04	0.33	0.22	0.00	0.00	0.00	0.00	0.17	0.17	2.50	1.10	7.17	2.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	32	bottom	0	21.33	8.96	0.33	0.22	0.00	0.00	0.00	0.00	3.50	2.63	1.33	0.51	20.00	8.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	35	bottom	1	23.83	9.23	2.00	1.35	0.00	0.00	0.00	0.00	9.00	4.30	2.50	1.33	16.17	7.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	30	bottom	0	12.67	5.25	1.33	1.33	0.00	0.00	0.00	0.00	10.00	4.66	1.67	1.01	1.50	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	45	bottom	11	0.83	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.36	0.67	0.28	0.33	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Highway Creek:Mean and Standard Error (SE) for Submerged Macrophytes at HC-2

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	ns	12.81	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.31	0.94	5.76	0.61	***0.50***	***0.50***	0.00	0.00	3.71	0.79	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	ns	7	42.17	5.93	0.00	0.00	0.00	0.00	0.00	0.00	9.21	4.99	13.97	4.59	25.74	3.98	0.00	0.00	0.00	0.00	2.31	0.69	0.00	0.00	0.00	0.00	0.00	0.00
May-97	55	bottom	23	7.13	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.13	8.42	0.65	***0.40***	***0.20***	0.00	0.00	0.80	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Sep-97	77.5	bottom	0	91.40	2.12	1.40	1.01	0.00	0.00	0.00	0.00	27.80	4.95	0.90	0.45	79.60	3.89	0.00	0.00	0.00	0.00	1.60	0.80	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	67.5	bottom	2	38.40	5.34	1.07	0.83	0.00	0.00	0.00	0.00	18.00	5.92	6.80	2.46	14.93	2.15	0.00	0.00	0.00	0.00	0.93	0.58	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	55	bottom	0	59.73	4.21	0.40	0.29	2.40	0.59	19.60	4.32	13.87	3.68	6.67	1.70	26.67	4.14	0.00	0.00	0.00	0.00	0.53	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	55	bottom	0	30.93	3.85	0.00	0.00	1.47	0.36	9.20	3.04	1.87	1.16	13.87	2.20	9.07	1.95	0.00	0.00	0.00	0.00	1.07	0.43	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	50	bottom	1.5	33.33	3.42	0.13	0.13	1.87	0.50	6.40	2.84	9.73	3.41	12.00	2.97	5.33	1.30	0.00	0.00	0.00	0.00	0.27	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	55	bottom	2	24.17	4.78	0.00	0.00	0.00	0.00	1.17	0.52	5.33	3.22	10.50	3.71	9.50	2.20	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	60	bottom	15	11.50	2.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.83	0.94	8.83	2.01	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Sep-98	90	bottom	1	24.83	5.07	0.17	0.17	0.00	0.00	0.00	0.00	0.67	0.67	3.00	0.72	22.83	4.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	70	bottom	0	35.00	6.68	0.17	0.17	0.00	0.00	0.00	0.00	0.67	0.67	2.67	0.62	33.67	6.90	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	65	bottom	1	55.67	7.43	1.00	0.72	0.00	0.00	0.00	0.00	7.33	4.85	3.67	0.48	49.00	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	58	bottom	1	40.33	6.16	1.00	0.67	0.00	0.00	0.00	0.00	14.83	5.67	2.50	0.36	23.67	5.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	70	bottom	13	19.50	4.11	0.00	0.00	0.33	0.33	0.00	0.00	2.83	2.04	4.67	0.75	13.67	3.68	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00

Highway Creek:Mean and Standard Error (SE) for Submerged Macrophytes at HC-3

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	ns	30.87	3.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.63	1.96	18.38	2.09	0.00	0.00	0.00	0.00	9.98	3.18	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	ns	8	76.97	4.36	7.29	2.06	***5.78***	***3.77***	0.00	0.00	0.00	0.00	0.00	0.00	68.04	7.63	0.00	0.00	0.00	0.00	0.57	0.25	0.00	0.00	0.00	0.00	0.00	0.00
May-97	70	bottom	25	11.93	2.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.51	2.40	***0.10***	***0.13***	0.00	0.00	1.13	0.49	0.00	0.00	0.00	0.00	0.00	0.00
Sep-97	100	bottom	2	56.60	4.55	2.90	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.20	4.61	0.00	0.00	0.00	0.00	0.40	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	75	bottom	4	36.27	5.61	8.13	5.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.53	4.29	0.00	0.00	0.00	0.00	1.60	0.59	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	76	bottom	0	50.40	4.36	1.73	0.64	1.60	0.62	0.00	0.00	0.00	0.00	0.13	0.13	34.93	4.80	0.00	0.00	0.00	0.00	14.53	4.88	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	81	bottom	0	36.80	3.75	0.00	0.00	3.87	1.18	0.00	0.00	0.00	0.00	0.40	0.21	29.60	3.64	0.00	0.00	0.00	0.00	6.27	1.71	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	70	bottom	3	23.20	3.20	2.53	1.27	4.13	1.73	0.00	0.00	0.00	0.00	0.40	0.29	13.33	2.05	0.00	0.00	0.00	0.00	6.80	2.05	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	85	bottom	6	26.33	4.68	0.17	0.17	2.67	0.86	0.00	0.00	0.00	0.00	0.00	0.00	21.33	4.36	0.00	0.00	0.00	0.00	3.83	1.19	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	84	72	19	5.33	1.40	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.17	0.17	4.00	1.37	0.00	0.00	0.00	0.00	1.50	0.74	0.00	0.00	0.00	0.00	0.00	0.00
Sep-98	100	bottom	1.5	10.83	2.95	0.33	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.17	3.22	0.00	0.00	0.00	0.00	2.67	0.62	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	90	bottom	0	7.50	2.45	1.17	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.67	2.38	0.00	0.00	0.00	0.00	3.17	1.09	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	80	bottom	1	29.67	6.37	16.17	7.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.67	2.62	0.00	0.00	0.00	0.00	7.17	2.66	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	79	bottom	4	42.67	6.70	10.50	4.57	1.33	0.51	0.00	0.00	0.00	0.00	0.17	0.17	14.50	4.94	0.00	0.00	0.00	0.00	21.00	5.32	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	90	bottom	17	27.17	5.04	0.00	0.00	0.67	0.38	0.00	0.00	0.00	0.00	0.00	0.00	4.83	1.64	0.00	0.00	0.00	0.00	23.00	5.84	0.00	0.00	0.00	0.00	0.00	0.00

Highway Creek:Mean and Standard Error (SE) for Submerged Macrophytes at HC-4

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	ns	1.92	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.49	0.72	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	ns	11	2.72	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.19	1.88	0.72	0.00	0.00	0.00	0.00	0.00	0.00
May-97	85	bottom	29	8.91	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24	0.46	0.00	0.00	0.00	0.00	6.89	2.17	0.13	0.13	***0.10***	***0.14***	0.00	0.00	0.00	0.00
Sep-97	145	bottom	0	1.33	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.76	0.00	0.00	0.38	0.26	0.38	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	115	bottom	5	12.80	3.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.18	0.00	0.00	0.00	0.00	0.00	0.00	12.80	3.97	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	136	bottom	3	34.13	7.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.58	33.33	7.29	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	139	bottom	1	31.07	6.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67	1.86	28.40	6.19	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	130	128	8	41.33	6.29	0.00	0.00	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	41.33	6.29	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	168	bottom	5	23.67	6.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	2.67	2.33	21.00	6.05	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	135	bottom	18	5.00	1.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.28	0.00	0.00	0.00	0.00	2.33	1.74	2.50	0.82	0.00	0.00	0.00	0.00	0.00	0.00
Sep-98	175	bottom	1	1.33	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	1.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	155	bottom	0	0.83	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	155	bottom	2	1.83	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.67	0.45	1.17	0.72	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	160	bottom	5	8.17	3.30	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.22	0.17	0.17	0.00	0.00	0.17	0.17	8.00	3.33	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	157	bottom	18	9.67	3.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.66	6.67	2.70	0.00	0.00	0.00	0.00	0.00	0.00

Highway Creek:Mean and Standard Error (SE) for Submerged Macrophytes at HC-4A

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-97	47.5	bottom	28.5	50.82	3.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.14	48.71	3.73	0.00	0.00	0.00	0.00	5.84	1.79	0.00	0.00	0.00	0.00	0.00	0.00
Sep-97	65	bottom	2.5	95.60	1.74	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	32.50	7.77	91.60	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	50	bottom	5	84.80	6.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.73	6.72	56.53	6.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	42.5	bottom	4	70.13	6.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.60	4.67	60.53	6.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	50	bottom	0	30.93	4.63	0.40	0.29	0.00	0.00	0.00	0.00	0.53	0.53	18.80	3.65	12.00	2.10	0.00	0.00	0.00	0.00	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	38	bottom	7.5	33.33	5.60	0.13	0.13	0.00	0.00	0.00	0.00	0.27	0.27	25.07	4.82	10.53	2.23	0.00	0.00	0.00	0.00	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	48	bottom	5	41.67	5.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.33	2.23	36.33	4.79	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	50	bottom	14	41.33	7.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.50	1.16	37.33	7.34	0.00	0.00	0.00	0.00	0.50	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Sep-98	73	bottom	1	21.67	4.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	0.45	21.33	4.27	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	65	bottom	0	39.67	4.42	3.00	1.71	0.00	0.00	0.00	0.00	0.00	0.00	5.33	1.54	32.67	3.90	0.00	0.00	0.00	0.00	0.50	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	44	bottom	0.5	60.33	9.04	2.33	1.01	0.00	0.00	0.00	0.00	0.00	0.00	3.67	0.69	58.33	9.39	0.00	0.00	0.00	0.00	1.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	56	bottom	4	60.67	8.07	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	3.33	1.05	58.00	8.29	0.00	0.00	0.00	0.00	0.83	0.30	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	65	bottom	16	54.33	8.45	0.50	0.36	0.00	0.00	0.00	0.00	0.00	0.00	3.67	0.81	53.33	8.40	0.00	0.00	0.00	0.00	0.33	0.22	0.00	0.00	0.00	0.00	0.00	0.00

Highway Creek:Mean and Standard Error (SE) for Submerged Macrophytes at HC-5

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	ns	21.90	3.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.67	3.75	0.00	0.00	0.00	0.00	4.81	1.10	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	ns	11	0.21	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May-97	75	bottom	29	4.36	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.00	0.00	3.99	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sep-97	97.5	bottom	2.5	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	76	bottom	7	10.93	5.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.00	0.00	0.00	0.00	0.13	0.13	10.93	5.72	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	75	bottom	5	6.67	2.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.54	6.13	2.02	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	79	bottom	4	21.60	7.38	0.53	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.94	20.00	7.41	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	67	bottom	8	24.27	6.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.37	23.73	6.65	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	79	bottom	13	21.00	3.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.67	0.00	0.00	0.00	0.00	4.33	2.33	16.67	4.53	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	84	bottom	23	2.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.26	0.00	0.00	0.00	0.00	0.67	0.38	1.17	0.72	0.00	0.00	0.00	0.00	0.00	0.00
Sep-98	105	bottom	1	12.33	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.00	3.54	0.00	0.00	0.00	0.00	0.33	0.22	1.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	89	bottom	0	12.67	3.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.00	3.71	0.00	0.00	0.00	0.00	0.33	0.22	1.50	0.70	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	78	bottom	3	30.50	7.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.17	7.73	0.00	0.00	0.00	0.00	2.67	0.99	0.83	0.46	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	75	bottom	12	36.33	11.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.17	11.08	0.00	0.00	0.00	0.00	4.00	1.78	1.33	0.57	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	87	bottom	20	34.33	9.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.83	10.48	0.00	0.00	0.00	0.00	2.83	1.57	6.00	2.23	0.00	0.00	0.00	0.00	0.00	0.00

Highway Creek:Mean and Standard Error (SE) for Submerged Macrophytes at HC-6

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	ns	20.69	2.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.67	3.07	3.42	1.33	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	ns	15	9.67	2.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.32	9.95	2.81	0.00	0.00	0.00	0.00	0.00	0.00
May-97	100	90	32	42.99	4.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.24	0.00	0.00	46.55	4.75	1.23	0.77	0.00	0.00	0.00	0.00	0.00	0.00
Sep-97	110	bottom	3.5	27.58	4.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.21	6.63	2.20	0.00	0.00	14.00	3.11	8.11	4.61	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	93	bottom	13	57.87	8.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.87	1.34	0.00	0.00	8.27	3.94	48.40	10.98	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	100	78	11	28.00	4.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.27	0.00	0.00	19.07	2.95	9.47	2.57	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	100	bottom	7	32.27	4.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.93	4.74	10.27	2.09	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	93	60	12	21.07	4.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.60	3.57	7.87	2.69	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	105	bottom	18	9.00	1.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	1.92	1.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	101	80	24	11.83	2.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.83	2.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sep-98	120	bottom	1.5	22.67	6.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.67	6.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	109	90	4	18.00	5.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.00	5.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	100	bottom	8	29.67	8.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.67	8.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	102	bottom	16	35.50	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.17	6.07	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	110	bottom	20	57.33	6.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	57.33	6.31	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00

Joe Bay:Mean and Standard Error (SE) for Submerged Macrophytes at JB-1

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
Apr-96	ns	bottom	ns	20.13	3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.22	0.53	0.32	0.00	0.00	17.47	3.55	0.00	0.00	2.67	1.68	0.00	0.00	0.00	0.00	0.00	0.00
May-96	ns	bottom	ns	2.22	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.37	0.00	0.00	1.33	0.90	0.00	0.00	0.00	0.00	0.00	0.00
Jun-96	ns	bottom	ns	2.78	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70	0.41	0.00	0.00	0.00	0.00	0.00	0.00	2.09	1.28	0.00	0.00	0.00	0.00	0.00	0.00
Aug-96	74	bottom	0	9.36	1.62	0.00	0.00	0.00	0.00	0.00	0.00	6.64	1.61	1.36	0.25	0.00	0.00	0.00	0.00	0.00	0.00	2.88	0.95	0.00	0.00	0.00	0.00	0.00	0.00
Oct-96	ns	bottom	ns	37.86	6.31	0.00	0.00	0.00	0.00	0.00	0.00	35.57	6.40	1.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	2.86	0.91	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	bottom	2	33.92	5.71	0.00	0.00	0.00	0.00	0.00	0.00	27.00	5.24	3.67	1.25	8.42	1.72	0.00	0.00	0.00	0.00	1.67	0.87	0.00	0.00	0.00	0.00	0.00	0.00
Jan-97	ns	bottom	13	36.16	5.04	0.00	0.00	0.00	0.00	0.00	0.00	30.40	4.77	2.32	0.62	0.00	0.00	0.00	0.00	0.00	0.00	7.68	2.84	0.00	0.00	0.00	0.00	0.00	0.00
Feb-97	40	bottom	2.5	61.28	7.01	0.00	0.00	0.00	0.00	0.00	0.00	60.80	7.09	1.44	0.48	0.00	0.00	0.00	0.00	0.00	0.00	6.08	2.15	0.00	0.00	0.00	0.00	0.00	0.00
Apr-97	52.5	bottom	25	77.76	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.56	0.62	0.00	0.00	73.12	5.67	0.00	0.00	12.48	3.40	0.00	0.00	0.00	0.00	0.00	0.00
Jun-97	85	bottom	0.5	58.40	6.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.00	3.64	0.00	0.00	52.32	7.20	0.00	0.00	2.32	0.81	0.00	0.00	0.00	0.00	0.00	0.00
Jul-97	61	bottom	2	45.92	7.75	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.36	28.88	7.29	0.08	0.08	23.12	6.43	0.00	0.00	1.52	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Sep-97	82.5	bottom	0	40.96	6.54	0.00	0.00	0.00	0.00	0.00	0.00	16.16	4.67	24.64	6.62	1.60	0.68	0.00	0.00	0.00	0.00	1.20	0.57	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	63	bottom	3	43.68	6.41	1.92	1.92	0.00	0.00	0.00	0.00	14.72	3.60	24.32	5.86	1.76	0.97	0.00	0.00	0.00	0.00	5.12	1.64	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	52	bottom	0	40.88	5.85	0.16	0.16	0.00	0.00	7.68	3.43	10.24	3.09	13.68	3.86	0.40	0.33	0.00	0.00	0.00	0.00	13.60	5.36	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	55	bottom	0	61.60	5.09	0.96	0.81	0.00	0.00	0.64	0.30	24.64	5.39	13.28	3.25	2.16	0.74	17.20	4.97	0.00	0.00	13.76	4.83	0.00	0.00	0.00	0.00	0.00	0.00
May-98	45	bottom	4	64.16	6.10	9.20	4.94	0.00	0.00	4.72	0.98	17.60	4.38	11.60	3.36	1.12	0.58	22.72	5.90	0.00	0.00	12.40	4.37	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	59	bottom	3	31.00	6.19	4.83	3.17	0.00	0.00	0.00	0.00	4.67	1.94	16.17	6.82	0.17	0.17	1.00	1.00	0.00	0.00	6.83	2.85	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	55	bottom	16	28.33	5.99	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	15.17	4.00	0.00	0.00	0.00	0.00	0.00	0.00	13.83	5.14	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	68	bottom	0	31.83	8.38	4.00	1.71	0.00	0.00	0.00	0.00	18.83	7.02	2.17	0.97	2.50	1.65	0.00	0.00	0.00	0.00	6.50	3.58	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	57	bottom	1	27.17	6.11	0.00	0.00	0.00	0.00	0.17	0.17	12.00	4.94	8.00	2.00	0.17	0.17	0.00	0.00	0.00	0.00	9.33	3.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	57	bottom	2	9.17	2.30	0.00	0.00	0.00	0.00	0.00	0.00	2.83	0.80	4.83	1.85	0.00	0.00	0.83	0.67	0.00	0.00	2.83	0.76	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	45	bottom	9	11.50	3.49	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	4.67	1.85	0.17	0.17	6.83	3.20	0.00	0.00	2.17	0.72	0.00	0.00	0.00	0.00	0.00	0.00

Joe Bay:Mean and Standard Error (SE) for Submerged Macrophytes at JB-2

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	ns	3.35	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.12	4.34	0.75	0.00	0.00	0.00	0.00	0.31	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	ns	3	17.93	6.24	1.14	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.25	5.91	0.00	0.00	0.00	0.00	3.81	1.68	0.00	0.00	0.00	0.00	0.00	0.00
May-97	40	bottom	29	46.63	4.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70	0.21	46.26	4.82	***1.40***	***1.04***	0.00	0.00	1.60	0.66	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	35	bottom	5	92.80	3.79	12.40	6.68	0.00	0.00	0.00	0.00	2.13	1.65	14.40	2.05	84.00	6.12	0.00	0.00	0.00	0.00	2.53	0.93	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	36	bottom	0	30.67	4.36	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.27	12.27	3.58	17.87	2.73	0.00	0.00	0.00	0.00	2.27	0.80	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	20	bottom	0	66.40	6.46	0.00	0.00	0.13	0.13	0.00	0.00	2.40	2.40	8.27	2.34	59.73	6.99	0.00	0.00	0.00	0.00	0.40	0.29	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	38	bottom	1	56.27	5.01	0.13	0.13	0.00	0.00	0.00	0.00	1.20	0.61	14.40	2.83	40.53	4.57	0.00	0.00	0.00	0.00	2.00	1.07	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	33	bottom	4	59.67	7.18	0.17	0.17	0.00	0.00	0.00	0.00	0.67	0.45	12.00	2.13	48.67	8.62	0.00	0.00	0.00	0.00	0.50	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	40	bottom	21	41.33	7.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.17	2.35	28.17	6.32	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	45	bottom	0	89.67	2.00	0.67	0.67	0.00	0.00	0.00	0.00	0.00	0.00	2.83	0.63	88.67	2.02	0.00	0.00	0.00	0.00	0.67	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	17	bottom	1	77.67	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.33	2.71	73.33	4.81	0.00	0.00	0.00	0.00	1.33	0.99	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	32	bottom	8	43.67	5.54	0.17	0.17	0.00	0.00	0.00	0.00	1.00	1.00	13.00	5.23	27.67	4.16	0.00	0.00	0.00	0.00	7.00	3.50	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	23	bottom	10	40.00	8.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.50	6.24	29.50	7.30	0.00	0.00	0.00	0.00	5.50	1.89	0.00	0.00	0.00	0.00	0.00	0.00

Joe Bay:Mean and Standard Error (SE) for Submerged Macrophytes at JB-3

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	ns	0.61	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.37	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	ns	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May-97	75	bottom	30	12.40	2.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.18	2.35	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	90	bottom	6	95.47	1.70	2.27	2.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.40	1.16	0.00	0.00	0.00	0.00	95.47	1.70	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	70	bottom	2	50.67	5.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.00	0.00	0.00	0.00	50.67	5.45	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	69	bottom	0	21.87	3.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.87	3.64	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	70	bottom	5	9.47	1.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.27	0.00	0.00	0.00	0.00	9.20	1.88	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	85	bottom	18	1.50	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	80	bottom	23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	82	bottom	0	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	70	bottom	2	0.33	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	81	bottom	11	0.50	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	68	bottom	18	9.33	4.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.33	4.22	0.00	0.00	0.00	0.00	0.00	0.00

Joe Bay:Mean and Standard Error (SE) for Submerged Macrophytes at JB-4

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	ns	48.98	3.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.07	3.78	0.00	0.00	0.00	0.00	23.36	6.79	1.88	0.72	***7.61***	***1.67***	0.00	0.00	0.00	0.00
Nov-96	ns	ns	5	21.76	2.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.43	3.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May-97	120	bottom	32	49.30	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.42	0.97	0.00	0.00	0.00	0.00	47.38	6.39	0.00	0.00	***4.90***	***1.39***	0.00	0.00	0.00	0.00
Nov-97	125	bottom	9	22.13	5.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.27	0.00	0.00	0.00	0.00	21.87	5.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	120	110	3	28.53	6.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.18	0.00	0.00	0.00	0.00	28.40	6.92	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	108	79	0	22.13	5.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.13	5.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	100	62	9	42.67	6.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.73	5.74	3.07	2.38	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	115	bottom	19	38.00	6.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.00	6.72	0.33	0.22	3.50	1.21	0.00	0.00	0.00	0.00
Jul-98	120	bottom	25	39.17	7.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.46	0.00	0.00	0.00	0.00	37.50	8.15	0.67	0.38	1.50	0.66	0.00	0.00	0.00	0.00
Oct-98	119	bottom	0	27.00	6.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.36	0.00	0.00	0.00	0.00	26.67	6.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	108	bottom	3	39.00	6.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.36	0.00	0.00	0.00	0.00	38.33	6.76	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	120	bottom	13	50.83	11.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	50.33	11.47	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	100	bottom	18	59.67	7.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.22	0.00	0.00	0.00	0.00	59.67	7.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Joe Bay:Mean and Standard Error (SE) for Submerged Macrophytes at JB-5

						FRESHWATER								EURYHALINE										MARINE			
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	ns	14.41	1.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.33	2.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	ns	15	10.29	1.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.16	1.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May-97	60	bottom	33	48.42	3.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	53.95	3.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	59	bottom	20	26.93	2.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.53	3.02	2.40	1.09	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	41	bottom	3	48.27	3.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.80	4.47	12.40	4.80	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	39	30	0.5	32.40	4.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.13	4.26	7.47	3.67	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	48	bottom	10	34.13	2.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.27	2.72	2.13	0.82	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	50	bottom	20	33.67	4.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.67	4.68	0.83	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	52	bottom	26	62.00	6.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.00	6.10	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	56	bottom	0	44.33	3.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.33	3.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	53	bottom	8	78.00	4.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.67	4.10	1.17	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	49	bottom	24	91.33	2.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	91.33	2.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	40	bottom	20	79.00	4.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	78.33	4.28	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00

Joe Bay:Mean and Standard Error (SE) for Submerged Macrophytes at JB-6

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	20	79.10	4.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.29	5.60	15.23	3.96	***0.78***	***0.38***	0.00	0.00	0.72	0.72
Nov-96	ns	ns	16	24.81	3.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.83	4.08	0.00	0.00	0.00	0.00	0.00	0.00	1.15	0.79
May-97	47.5	bottom	33	62.94	3.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70.44	3.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	56	bottom	21	70.67	1.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70.67	1.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	45	bottom	6	75.20	3.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	73.87	3.22	1.87	0.95	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	30	25	0.5	57.60	4.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	56.80	4.59	2.27	0.51	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	45	bottom	10	62.67	3.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	64.00	2.92	1.47	0.82	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	46	bottom	20	70.00	5.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	69.67	5.60	0.33	0.33	0.17	0.17	0.00	0.00	0.00	0.00
Jul-98	50	bottom	25	76.00	2.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.00	2.26	0.17	0.17	0.17	0.17	0.00	0.00	0.00	0.00
Oct-98	55	bottom	0	63.00	2.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.00	2.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	45	bottom	8	71.67	4.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.33	4.26	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	48	bottom	25	79.00	4.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.00	4.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	40	bottom	20	65.00	3.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	65.00	3.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Taylor River:Mean and Standard Error (SE) for Submerged Macrophytes at TR-1

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
Apr-96	ns	bottom	ns	44.70	3.62	0.00	0.00	0.00	0.00	0.00	0.00	37.22	4.29	2.96	5.31	3.48	2.45	2.09	6.93	0.00	0.00	0.70	3.12	0.00	0.00	0.00	0.00	0.00	0.00
May-96	ns	bottom	ns	8.71	1.84	0.00	0.00	0.00	0.00	0.00	0.00	1.41	1.43	2.00	1.87	4.47	1.82	0.00	0.00	0.00	0.00	1.53	2.46	0.00	0.00	0.00	0.00	0.00	0.00
Jun-96	73	bottom	ns	5.96	2.03	0.00	0.00	0.00	0.00	0.00	0.00	0.18	2.83	1.82	2.09	3.20	2.23	0.00	0.00	0.00	0.00	1.64	2.43	0.00	0.00	0.00	0.00	0.00	0.00
Aug-96	58	bottom	0	12.80	3.48	0.16	2.00	0.00	0.00	0.00	0.00	8.08	3.20	1.20	1.83	5.84	3.18	0.00	0.00	0.00	0.00	0.24	1.80	0.00	0.00	0.00	0.00	0.00	0.00
Oct-96	74	bottom	ns	28.00	4.28	4.08	3.81	0.00	0.00	0.00	0.00	17.12	4.41	1.28	1.43	8.16	3.79	0.00	0.00	0.00	0.00	1.92	4.85	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	bottom	0	34.52	4.68	3.48	4.46	0.00	0.00	0.00	0.00	30.00	5.23	2.44	1.99	5.70	2.73	0.00	0.00	0.00	0.00	1.26	4.17	0.00	0.00	0.00	0.00	0.00	0.00
Jan-97	ns	bottom	0	61.44	3.72	1.60	3.85	0.00	0.00	0.00	0.00	60.48	3.83	0.96	1.33	4.24	3.34	0.00	0.00	0.00	0.00	0.16	1.38	0.00	0.00	0.00	0.00	0.00	0.00
Feb-97	65	bottom	0	52.64	4.27	0.88	2.76	0.00	0.00	0.00	0.00	48.32	4.58	1.04	1.15	7.76	3.09	0.00	0.00	0.00	0.00	0.08	1.41	0.00	0.00	0.00	0.00	0.00	0.00
Apr-97	46	bottom	22	3.28	1.56	0.08	1.41	0.00	0.00	0.00	0.00	1.36	2.02	1.04	1.89	1.12	1.35	0.00	0.00	0.00	0.00	0.56	1.81	0.00	0.00	0.00	0.00	0.00	0.00
Jun-97	122.5	bottom	2	0.80	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	1.32	0.32	1.67	0.00	0.00	0.00	0.00	0.16	2.00	0.00	0.00	0.00	0.00	0.00	0.00
Jul-97	90	bottom	2	6.32	3.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	1.57	5.60	3.53	0.00	0.00	0.00	0.00	0.88	1.39	0.00	0.00	0.00	0.00	0.00	0.00
Sep-97	87.5	bottom	2	41.92	4.80	0.00	0.00	0.00	0.00	0.00	0.00	3.54	6.46	0.85	1.53	37.92	5.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	79	bottom	1	44.00	5.65	3.68	6.01	0.00	0.00	0.00	0.00	14.64	6.37	1.28	1.83	31.36	5.28	0.00	0.00	0.00	0.00	0.16	2.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	74	bottom	1	38.24	5.48	5.28	3.36	0.00	0.00	10.64	5.48	7.28	5.25	1.04	2.48	21.28	5.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	87.5	bottom	0	29.92	5.71	4.00	5.03	0.00	0.00	8.48	7.32	14.96	6.45	1.76	1.96	6.16	3.09	0.00	0.00	0.00	0.00	0.24	1.80	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	73	bottom	0.5	32.80	6.11	3.12	5.39	0.00	0.00	10.32	5.70	17.92	6.38	1.44	1.23	6.32	3.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	78	bottom	15	6.63	2.78	1.38	2.04	0.00	0.00	0.00	0.00	2.38	2.47	1.75	1.22	0.00	0.00	0.00	0.00	0.00	0.00	1.75	4.55	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	78	bottom	1	0.83	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.17	1.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	1.46	0.00	0.00	0.00	0.00	0.00	0.00
Sep-98	90	bottom	1	12.33	4.45	0.50	1.28	0.00	0.00	0.00	0.00	5.00	5.35	0.00	0.00	7.67	4.30	0.00	0.00	0.00	0.00	0.17	1.41	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	90	bottom	1	38.00	4.54	0.83	2.55	0.00	0.00	0.00	0.00	16.33	6.31	0.17	1.41	18.67	3.09	0.00	0.00	0.00	0.00	0.67	2.83	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	87	bottom	0	54.17	4.19	17.83	8.49	0.00	0.00	0.00	0.00	26.00	5.03	0.33	1.35	20.33	4.85	0.00	0.00	0.00	0.00	0.50	1.76	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	76	bottom	0	28.50	5.09	18.67	6.18	0.00	0.00	0.17	1.41	9.00	3.54	0.00	0.00	5.33	2.10	0.00	0.00	0.00	0.00	0.17	1.41	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	71	bottom	6	17.00	4.68	8.17	6.60	0.00	0.00	0.00	0.00	8.00	3.19	0.83	1.46	0.50	1.76	0.00	0.00	0.00	0.00	1.00	2.34	0.00	0.00	0.00	0.00	0.00	0.00

Taylor River:Mean and Standard Error (SE) for Submerged Macrophytes at TR-2

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	ns	13.41	2.28	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.26	0.30	0.12	5.25	0.98	0.00	0.00	0.00	0.00	9.96	2.58	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	bottom	0	19.38	3.72	3.50	1.03	0.00	0.00	0.00	0.00	7.35	3.51	0.26	0.20	6.94	1.04	0.00	0.00	0.00	0.00	5.50	1.75	0.00	0.00	0.00	0.00	0.00	0.00
May-97	80	bottom	27	18.50	2.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	19.98	2.58	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	95	bottom	1	83.47	6.54	41.73	10.98	0.00	0.00	0.00	0.00	1.33	1.08	0.67	0.25	45.07	7.97	0.00	0.00	0.00	0.00	8.40	3.63	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	95	bottom	0	61.33	9.32	37.33	11.31	0.00	0.00	0.00	0.00	6.93	4.79	0.53	0.36	18.67	6.07	0.00	0.00	0.00	0.00	8.80	2.34	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	95	bottom	0	57.87	9.84	32.13	11.55	0.00	0.00	6.93	4.63	8.00	6.10	0.00	0.00	8.93	5.72	0.00	0.00	0.00	0.00	10.80	3.11	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	85	bottom	0.5	56.00	8.39	20.00	7.60	0.00	0.00	10.27	5.85	19.20	8.12	0.00	0.00	3.87	1.44	0.00	0.00	0.00	0.00	10.67	2.70	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	85	bottom	18	24.17	5.79	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.17	0.17	0.00	0.00	0.00	0.00	23.83	5.63	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	92	bottom	2	24.33	6.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67	0.99	0.17	0.17	0.00	0.00	0.00	0.00	23.33	6.65	0.00	0.00	0.00	0.00	0.00	0.00
Sep-98	68	bottom	1	21.00	6.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67	0.83	4.00	1.94	0.00	0.00	0.00	0.00	18.00	6.12	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	100	bottom	0	24.67	7.06	1.83	0.46	0.00	0.00	0.00	0.00	0.00	0.00	3.67	1.49	2.00	0.74	0.00	0.00	0.00	0.00	22.33	6.55	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	98	bottom	0	22.17	6.09	1.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	4.17	2.01	4.67	1.88	0.00	0.00	0.00	0.00	14.50	3.99	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	90	bottom	0	27.67	7.65	1.00	0.67	0.00	0.00	0.00	0.00	0.33	0.33	0.33	0.22	0.33	0.22	0.00	0.00	0.00	0.00	26.67	7.68	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	90	bottom	12	22.83	7.70	0.67	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.17	7.84	0.00	0.00	0.00	0.00	0.00	0.00

Taylor River:Mean and Standard Error (SE) for Submerged Macrophytes at TR-3

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	20	2.40	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.05	0.81	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	125	bottom	0	3.04	1.38	0.43	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	2.51	1.45	0.00	0.00	0.00	0.00	0.00	0.00
May-97	100	bottom	28	12.78	3.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.87	4.40	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	110	bottom	3.5	6.67	6.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	6.67	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	100	bottom	0.5	0.67	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.54	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	105	bottom	0	6.40	5.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.40	5.60	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	93	bottom	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	98	70	19	6.17	5.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.17	5.99	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	115	bottom	5	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Sep-98	120	bottom	2	0.33	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	118	bottom	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	100	bottom	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	107	bottom	0	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	103	bottom	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Taylor River:Mean and Standard Error (SE) for Submerged Macrophytes at TR-4

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	110	ns	22	16.73	2.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.92	2.82	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	115	bottom	0	57.45	5.36	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	65.12	6.58	0.00	0.00	0.00	0.00	0.00	0.00
May-97	112.5	bottom	28.5	28.85	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.08	4.33	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	128	120	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	118	bottom	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	145	bottom	0	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	115	bottom	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	120	110	20	0.33	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	128	bottom	9	1.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.38	0.17	0.17	0.00	0.00	0.00	0.00
Sep-98	140	120	2.5	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	143	bottom	0	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	130	bottom	0	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	135	bottom	0	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	125	bottom	19	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Taylor River:Mean and Standard Error (SE) for Submerged Macrophytes at TR-5

						FRESHWATER								EURYHALINE										MARINE					
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	23	14.11	1.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.26	0.00	0.00	0.00	0.00	14.70	2.24	0.00	0.00	0.00	0.00	0.00	0.00
Nov-96	ns	bottom	0	58.09	3.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.14	2.49	0.00	0.00	0.00	0.00	60.22	3.44	0.00	0.00	0.00	0.00	0.00	0.00
May-97	65	55	30	3.89	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	3.08	0.45	0.00	0.00	0.00	0.00	0.00	0.00
Nov-97	63	bottom	3	76.27	8.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.27	57.87	10.47	0.00	0.00	0.00	0.00	24.40	7.93	0.00	0.00	0.00	0.00	0.00	0.00
Jan-98	60	bottom	1	92.80	2.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.53	6.52	49.47	11.60	0.00	0.00	0.00	0.00	57.07	8.28	0.00	0.00	0.00	0.00	0.00	0.00
Mar-98	68	bottom	0	85.87	4.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.00	7.48	60.80	10.49	0.00	0.00	0.00	0.00	32.93	6.64	0.00	0.00	0.00	0.00	0.00	0.00
Apr-98	68	bottom	3.5	90.93	2.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.80	8.39	19.07	3.20	0.00	0.00	0.00	0.00	18.67	7.27	0.00	0.00	0.00	0.00	0.00	0.00
Jun-98	68	53	20	6.17	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.74	0.50	0.36	0.00	0.00	0.00	0.00	2.50	0.99	0.00	0.00	0.00	0.00	0.00	0.00
Jul-98	75	bottom	15	3.33	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Sep-98	90	bottom	5	1.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Oct-98	80	bottom	0	1.67	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.26	0.17	0.17	0.00	0.00	0.00	0.00	1.33	0.45	0.00	0.00	0.00	0.00	0.00	0.00
Dec-98	65	bottom	1	1.17	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Jan-99	68	bottom	1	3.67	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.67	1.01	0.00	0.00	0.00	0.00	0.00	0.00
Mar-99	70	bottom	19	4.83	1.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	1.71	0.00	0.00	0.00	0.00	0.00	0.00

Taylor River:Mean and Standard Error (SE) for Submerged Macrophytes at TR-6

						FRESHWATER								EURYHALINE										MARINE			
Date	Depth	Secchi	Sal	Total		NAJ MAR		NIT SP		UTR GIB		UTR SP		BAT OER		CHA HOR		CLA SP		HAL WRI		RUP MAR		ACE CAL		RED ALGAE		THA TES	
	(cm)	(cm)	(ppt)	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE	mean	SE
May-96	ns	ns	26	85.55	2.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.28	0.00	0.00	0.00	0.00	10.42	5.14	0.12	0.12	0.00	0.00	0.00	0.00	78.79	3.22
Nov-96	90	bottom	10	68.65	3.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.91	5.05	0.00	0.00	0.00	0.00	0.00	0.00	38.08	5.69
May-97	95	bottom	30.5	83.39	2.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.14	0.00	0.00	0.00	0.00	10.44	4.22	0.00	0.00	***1.50***	***0.28***	***1.75***	***1.75***	73.72	4.77
Nov-97	90	bottom	12	78.93	2.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13	0.41	0.00	0.00	0.00	0.00	15.47	2.89	0.00	0.00	0.00	0.00	0.00	0.00	69.07	2.77
Jan-98	85	bottom	4	75.47	2.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.47	0.41	0.00	0.00	0.00	0.00	31.47	6.13	0.00	0.00	0.00	0.00	0.00	0.00	53.87	3.88
Mar-98	90	85	8	69.87	3.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.00	0.00	0.00	0.00	17.07	4.96	0.00	0.00	0.00	0.00	0.00	0.00	57.33	5.80
Apr-98	95	40	12	84.00	2.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.18	0.00	0.00	0.00	0.00	20.93	5.97	0.27	0.27	0.00	0.00	0.00	0.00	70.67	6.67
Jun-98	90	55	22	80.67	3.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.28	0.00	0.00	0.00	0.00	23.83	5.15	0.00	0.00	0.50	0.26	0.00	0.00	63.33	6.96
Jul-98	100	bottom	23	93.33	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.26	0.00	0.00	0.00	0.00	11.67	3.20	0.00	0.00	0.00	0.00	0.00	0.00	87.00	3.20
Sep-98	125	110	19	81.33	3.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.38	0.00	0.00	0.00	0.00	14.17	4.90	0.00	0.00	0.00	0.00	0.00	0.00	70.33	6.81
Oct-98	98	bottom	5.5	61.67	4.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	7.83	1.99	0.00	0.00	0.00	0.00	0.00	0.00	57.00	5.79
Dec-98	90	bottom	5	65.33	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.33	2.51	0.00	0.00	0.00	0.00	0.00	0.00	59.33	5.16
Jan-99	98	bottom	8	71.00	4.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.50	8.31	0.00	0.00	0.00	0.00	0.00	0.00	57.67	7.36
Mar-99	93	bottom	22	71.33	3.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.17	3.93	0.00	0.00	0.00	0.00	0.00	0.00	60.33	5.36

Editorial Note: Appendix J has been submitted for peer review and should be referenced by the following citation. Reprints are not yet available.

Faunce, C.H., H.M. Patterson, and J.J. Lorenz In Review. Reproductive Biology of the Introduced Mayan Cichlid Cichlasoma urophthalmus in an Estuarine Mangrove Habitat of Southeastern Florida, USA. Fishery Bulletin.

Appendix J. Age, growth, and mortality of the Mayan cichlid, Cichlasoma urophthalmus, from the southeastern Everglades

Craig H. Faunce, Heather M. Patterson, Jerome J. Lorenz

ABSTRACT

Introduced Mayan cichlids were collected monthly from March 1996 to October 1997 with hook-and-line gear at Taylor River, Florida. Their ages were determined by examining thin sectioned otoliths. Marginal-increment analysis showed that opaque growth zones (rings) were annuli deposited on the otolith between January and May. Growth of Mayan cichlids was asymptotic and was modeled by the von Bertalanffy growth equation: L_t=191.96(1-exp[-0.32(t-0.27)]). The size of Mayan cichlids at age one was estimated at 33-66 mm standard length and was supported by monthly length-frequency data of young-of-year fish collected with drop traps over a seven year period. Mayan cichlids up to 6.8 years old were observed. The weight-length relationship for males and females were not significantly different; however males in the population were larger-at-age than females. Separate estimates of total annual mortality were relatively consistent (0.44-0.60) and indicate moderate mortality at higher age classes. Our data indicate that Mayan cichlids grew slower and lived longer in Florida than had been previously reported from native Mexican habitats. Because colder winter temperatures in Florida periodically slowed the growth of Mayan cichlids to produce visible annuli, it may be possible to similarly age introduced populations of other subtropical and tropical cichlids

INTRODUCTION

The Mayan cichlid, Cichlasoma urophthalmus (Günther), is native to the fresh and brackish waters of the Atlantic slope from Mexico to Nicaragua, and supports both commercial

artisanal fisheries and aquaculture efforts in the region (Miller, 1966; Martinez-Palacios and Ross, 1992). The first collections of the Mayan cichlid in the United States were made in 1983 from a freshwater habitat and a mangrove creek within Everglades National Park, Florida (Loftus, 1987). While it remains unknown how or where Mayan cichlids first entered Florida waters, there is evidence that the discovery of this exotic fish was made shortly after the time of their introduction (Loftus, 1987). Since their discovery, Mayan cichlids have expanded their range to include a variety of habitats from Naples (26°05'N, 81°48'W) to West Palm Beach (26°45'N, 80°04'W) and continue to be abundant in the man-made freshwater canals and estuarine mangrove habitats of the region (Trexler et al., 1999).

The introduction of the Mayan cichlid into southern Florida has had both economic and ecological significance. This species supports a small sport fishery because it is edible, attractive, and aggressive (Shafland, 1996). Anglers appreciate this fish because it readily takes artificial baits and fights hard on light tackle. In some areas the Mayan cichlid is the most common fish caught by recreational anglers and is targeted by subsistence fishers. However there is concern that the interaction between Mayan cichlids and native fish may profoundly alter the native ichthyofauna of the Everglades/Florida Bay region. While it is unclear whether Mayan cichlids serve as an abundant food supply for higher trophic levels, they are known to be carnivorous and prey upon native fishes (Martinez-Palacios and Ross, 1988; Howard et al., 1995).

Previous studies of the Mayan cichlid have focused almost entirely on its suitability for aquaculture in Mexico (e.g. Martinez-Palacios and Ross, 1986; Flores-Nava et al., 1989; Ross and Beveridge, 1995), and potential for range expansion in the U.S. (e.g. Stauffer and Boltz, 1994). Few studies address the life history of the Mayan cichlid, and only scant information exists on the age structure and growth rate of this species. Based upon seasonal length-frequency distributions from Celestun Lagoon, Mexico, Martinez-Palacios and Ross (1992) concluded that Mayan cichlids 70-130 mm standard length had completed their first spring and were reproductively active, while individuals 131-200 mm had entered their second reproductive year. Because they observed no fish over 200 mm, Martinez-Palacios and Ross (1992) concluded that the population of Mayan cichlids in the lagoon was composed of fast-growing fish with one or exceptionally two reproductive seasons in their lifetimes. Aging of Mayan cichlids using a validated method is needed to determine the accuracy of previously reported age and growth

estimates and to compare the age structure between Mexican and Florida populations. In order to address these needs, herein we provide a first account of the age, growth, and mortality of the Mayan cichlid from Florida waters using sectioned otoliths.

METHODS

Mayan cichlids were collected from the dwarf mangrove forests of southeastern Florida. The habitat is dominated by small (0.5-2.0 m tall) red mangrove trees (Rhizophora mangle) in an expansive, seasonally inundated wetland of typically shallow water (average maximum depth=30 cm). These mangroves increase in canopy width and height with closer proximity to continuously inundated deeper creeks. The system is mostly fresh water during July-February but becomes more saline (10-35 ‰) during the dry season (March-June).

Cichlids less than 65 mm standard length were effectively collected using drop traps (details in Lorenz et al., 1997). Drop trap samples were collected approximately every six weeks beginning in August 1990 at Highway Creek, September 1990 at Joe Bay, and December 1991 at Taylor River (Figure J.1). Each site was examined each year (1990-1996) to determine when Mayan cichlids first recruit and were subsequently combined for analyses of monthly length-frequencies.

Larger cichlids (>65 mm standard length) were captured more effectively using hook-and-line gear comparable to that used in other studies (Martinez-Palacios and Ross, 1992). We used size 10-2 hooks baited with sections of peneid shrimp. Hook-and-line collections were conducted monthly during March 1996-October 1997 in Taylor River, a major freshwater tributary from the Everglades that empties into northeastern Florida Bay. Each fishing effort continued until approximately 40 fish were obtained. Individual fish were measured for standard length (SL) and total length (TL) to the nearest millimeter, weighed to the nearest 0.1 gram, and sexed (Faunce and Lorenz, 1999). All lengths reported hereafter are standard lengths.

Sagittal otoliths were removed, blotted dry, and stored in vials until sectioning. The left sagitta was used for age determination unless broken. The sagitta was affixed to a slide with thermoplastic quartz cement, and three or four 0.5 mm thick sections, one through the core, were cut from the otolith using a low-speed Beuhler Isomet saw with diamond blade. The sections were mounted on a microscope slide with Histomount and allowed to dry. Sagittae from fish

smaller than 100 mm were embedded in Spurr, a high-density plastic medium (Secor et al., 1992) and a 1-2 mm thick transverse section containing the otolith core was then cut. The sections were mounted on a microscope slide with Crystal Bond 509 adhesive, and polished with wet and dry sandpaper of grit sizes 220-2000 until the growth rings were visible. A polishing cloth with 0.05 gamma alumina powder was used to remove scratches.

A standardized protocol for interpreting otolith growth zones was followed. When viewed with reflected light, the transverse sections of Mayan cichlid otoliths had two distinct regions: 1) an 'inner region' extending from the core to the first visible opaque zone (ring), and 2) an 'outer region' extending from the first visible opaque zone (ring) to the edge of the otolith (Figure J.2). The inner region was typically more opaque than the outer region and sometimes contained a visible growth zone (ring) and/or numerous check marks. Unfortunately, these marks were often difficult to interpret, were inconsistent between sections from individual fish, and in many cases absent altogether. Consequently, we did not count any marks from the inner region in our age estimations. However, the translucent appearance of the outer region of the otolith made it possible to count distinct, separate, opaque rings when present. The number of rings on each otolith section was counted independently by two readers using compound microscopes and compared. If there was a discrepancy in the count between readers, the section was re-examined. If a consensus could not be reached between the readers after the third reading, the otolith was excluded from the study.

Marginal-increment analysis was used to determine the periodicity of ring formation. The distance from the core to the proximal edge of each ring and to the dorso-lateral margin of the otolith (otolith radius) was measured. Measurements were made with a digital-image processing system along an axis adjacent to the sulcal ridge (Figure J.2). The distance from the outermost ring to the dorso-lateral margin (i.e. marginal increment=MI) was plotted by month (marginal-increment analysis). Linear regression was used to determine the degree to which otolith radius was related to standard length. Since the majority of Mayan cichlids in Florida spawn during May and June (Faunce and Lorenz, 1999), and ring formation occurred during January-May, we assigned each fish a biologically realistic median hatching date of June 1, incremented the ages in days to this date, and adjusted them according to the date of capture. Fish collected prior to June 1 that had not yet formed a new opaque ring (=high MI) and all fish collected after June 1 were

assigned a yearly age equal to its ring count, while fish collected before June 1 that had already formed a new opaque ring (i.e. an 'early' ring) were assigned a yearly age of one less than its ring count. To compare the timing of ring formation between age groups, marginal-increment analysis was performed on pooled ages 0-3 and 4-6 since our monthly sample sizes for individual age classes were insufficient for this analysis.

Length-length and length-weight relationships were calculated from fish collected with hook-and-line gear using linear regression procedures (Anderson and Neumann, 1996). The length-weight relationship for males and females were compared using an F-test of slopes (Sokal and Rolf, 1981). Length-frequency distributions for each sex caught with hook-and-line gear were compared using Mann-Whitney Rank Sum t-test. Growth analysis was performed by fitting the von Bertalanffy (1957) growth equation $L_t=L_\infty(1-\exp[-K(t-t_0)])$ to the final observed age-at-length data using nonlinear regression (SAS, 1989). Because we could not accurately assess the sex of each fish under 70 mm, we did not separate sexes for growth analyses.

We analyzed catch-curves using two methods to determine annual mortality rates for Mayan cichlids. Survival rate (S) and its respective variance were estimated using the empirical abundance data (Robson and Chapman, 1961) and the regression of the natural logarithm of year class abundance (Ricker, 1975). The instantaneous rate of mortality (Z) was then derived from the relationship $Z=-\ln(e^S)$. Total annual mortality (A) was computed as A=1-S. The age at full recruitment to the hook-and-line fishery based on our catch curve was determined to be four years, and all subsequent year classes sampled contained more than 5 individuals. Although it is standard protocol to begin catch-curve analysis with the first year class beyond the most abundant, we included the most abundant year class (age four) in our calculations since the maximum age class of the cichlids we collected was only six years.

RESULTS

Of 723 otoliths originally processed for aging, 391 were readable. Only five of these (1 %) were discarded because a consensus between readers could not be reached. A newly formed opaque ring was generally observed in fish captured January-May, and the mean monthly marginal increment reached a single yearly minimum in June for all age classes examined (Figure J.3). These data indicate that the opaque rings observed were annuli.

The growth of young-of-year Mayan cichlids collected with drop traps could be followed by the progression of modal length from monthly length-frequencies. Newly recruited fish (mode=10 mm) were present in August drop trap samples and grew to a modal size of 50 mm by June (Figure J.4). However, the size distribution of fish with one annulus (50-149 mm, mean=97 mm) was much larger than that of fish from our drop trap samples that had completed a full year's growth (June mode=50 mm). From this we concluded that the first annulus included in our age estimations was laid down between January and May of the fish's second year of growth, and adjusted our final age estimations accordingly.

The length of Mayan cichlids at a given age was predicted by the von Bertalanffy growth equation. Predicted lengths fit well with the final adjusted observed length-at-age data (r^2=0.77, n=386; Figure J.5), and the predicted length at age one (39.9 mm) was similar to the modal length observed from our drop trap samples (50 mm). Parameter estimates (± one standard error) for the von Bertalanffy growth equation were: L_∞=191.956 (8.964), K=0.319 (0.039), and t_0=0.270 (0.112). Mayan cichlids up to 6.8 years old were observed.

The size-frequency distributions of fish collected with hook-and-line gear ranged from 21-210 mm (median=127 mm, interquartile range=98 mm, n=1046). Males ranged from 69-210 mm (median=137 mm, interquartile range=119 mm, n=400), and females ranged from 58-190 mm (median=132 mm, interquartile range=115 mm, n=449)(Figure J.6). The length-frequency distribution for males was significantly larger than for females (P<0.001). The overall ratio of males to females was 1:1.1. Length-weight regressions for each sex were not significantly different ($F_{0.05(1,\infty)}$=3.583, n=838), so pooled length-length and length-weight regressions were estimated (Table J.1). Otolith radius was closely related to standard length (Table J.1).

Age-frequency distributions demonstrated that Mayan cichlids are fully recruited to the hook-and-line fishery at age 4 (Figure J.7). The majority of males (85.1%) and females (81.5%) collected by hook-and-line were 3-5 years old, and there was a significant difference (Mann-Whitney rank sum t-test, P<0.001) in the age-frequency distribution of males (median=3.67 years, interquartile range=2.12) and females (median=4.78 years, interquartile range=3.86). Total instantaneous mortality (Z), annual survival (S), and annual mortality (A) based on the regression of our catch-curve data were estimated at 0.57, 0.56, and 0.44 respectively (r^2=0.91, n=3). Robson and Chapman (1961) estimates were Z=0.91, S=0.40 (±0.035), and A=0.60.

DISCUSSION

Transverse otolith sections can be used to precisely age Mayan cichlids in Florida. There was a high degree of agreement (98.7%) in our age estimations between readers, and annuli corresponding to years 2-6 were clearly visible on the otoliths. The annulus corresponding to the first year's growth was either missing from the otolith or was not clear to the reader. This phenomenon has been observed from thin-sectioned otoliths of other fish species in Florida. Murphy and Taylor (1994) found that the first annulus was only visible in certain individuals of spotted seatrout, Cynoscion nebulosus. Similarly, Murphy and Taylor (1990) found the annulus corresponding to the first winter or spring was absent in red drum, Sciaenops ocellatus. Direct validation using marked otoliths is needed to confirm the presence and location of the first annulus on the otolith of Mayan cichlids, however our drop trap length-frequencies and marginal-increment analysis provide evidence that support our age determinations.

We report age-at-length data for Mayan cichlids that is very different from that estimated from Mexican populations. Cichlids in this study were much smaller at a given age than reported by Martinez-Palacios and Ross (1992) in Mexico; one-year-old cichlids were 33-66 mm in Florida compared to 70-130 mm in Mexico, whereas age-two fish were 83-111 mm in Florida compared to 131-200 mm in Mexico. Our maximum age of almost seven years was also much older than the maximum age of two years reported by Martinez-Palacios and Ross (1992). This data suggests that Mayan cichlids in our study grew slower and achieved older ages than those in native habitats and/or that exploitation is higher in Mexico and has reduced the number of older fish. Alternatively, it is possible that the seasonal length-frequencies which Martinez-Palacios and Ross (1992) based their study upon were insufficient to accurately identify separate year classes of fish. Future efforts should be made to age Mayan cichlids in their native habitat using thin-sectioned otoliths.

Our data provides a new perspective on the colonization of southern Florida by Mayan cichlids. Because it is assumed that Mayan cichlids first colonized south Florida at the time of their discovery in 1983 (Loftus, 1987), Mayan cichlids occupied virtually all of southern Florida in about 16 years. According to our data, this expansion occurred in approximately three generations.

Our estimates of total annual mortality for individuals greater than age four was moderate and fairly consistent between methods (A=0.44-0.60). Considering their limited mortality and relatively short reproductive season and life span, the success of Mayan cichlids in southern Florida is a testament to their evolutionary adaptations for colonization and survival.

Despite the fact that the Mayan cichlid has proliferated for over a decade in the natural and man-made habitats surrounding the Everglades, the study of this exotic fish has been virtually ignored in Florida. The continued presence of the Mayan cichlid within the native ichthyofauna of the Everglades/Florida Bay estuary necessitates future management and monitoring efforts. The data presented here are a valuable first step towards providing the information necessary to this effort. More exotic species occur in Florida than any other state in the U.S., and 13 of the 18 established exotic fishes are cichlids (Shafland, 1996). Future studies should determine if the techniques used here can be adopted to age other tropical cichlids. Understanding the life history of exotic fishes will become increasingly necessary as these species continue to flourish and spread in Florida, and will greatly assist future attempts to identify their effects on native fishes.

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Table J.1. Length-length, length-weight, and otolith radius-standard length regressions for the Mayan cichlid, *Cichlasoma urophthalmus*, from Taylor Slough, Florida. Regressions are in the form Y = a + bX. TL = total length (mm), SL = standard length (mm), WT = total weight (g), OR = otolith radius (mm), range = sample standard length range in regressions. Values in parentheses are standard errors.

Y	a	b	X	n	range (mm)	r^2
TL	0.6220 (0.2875)	1.3067 (0.0022)	SL	961	40 - 210	0.997
SL	-0.1281 (0.2202)	0.7631 (0.0013)	TL	961	40 - 210	0.997
$\log_{10}$WT	-4.2490 (0.0257)	2.9314 (0.01215)	$\log_{10}$SL	847	58 - 210	0.986
OR	0.1600 (0.0207)	0.0061 (0.0002)	SL	371	33 - 210	0.800

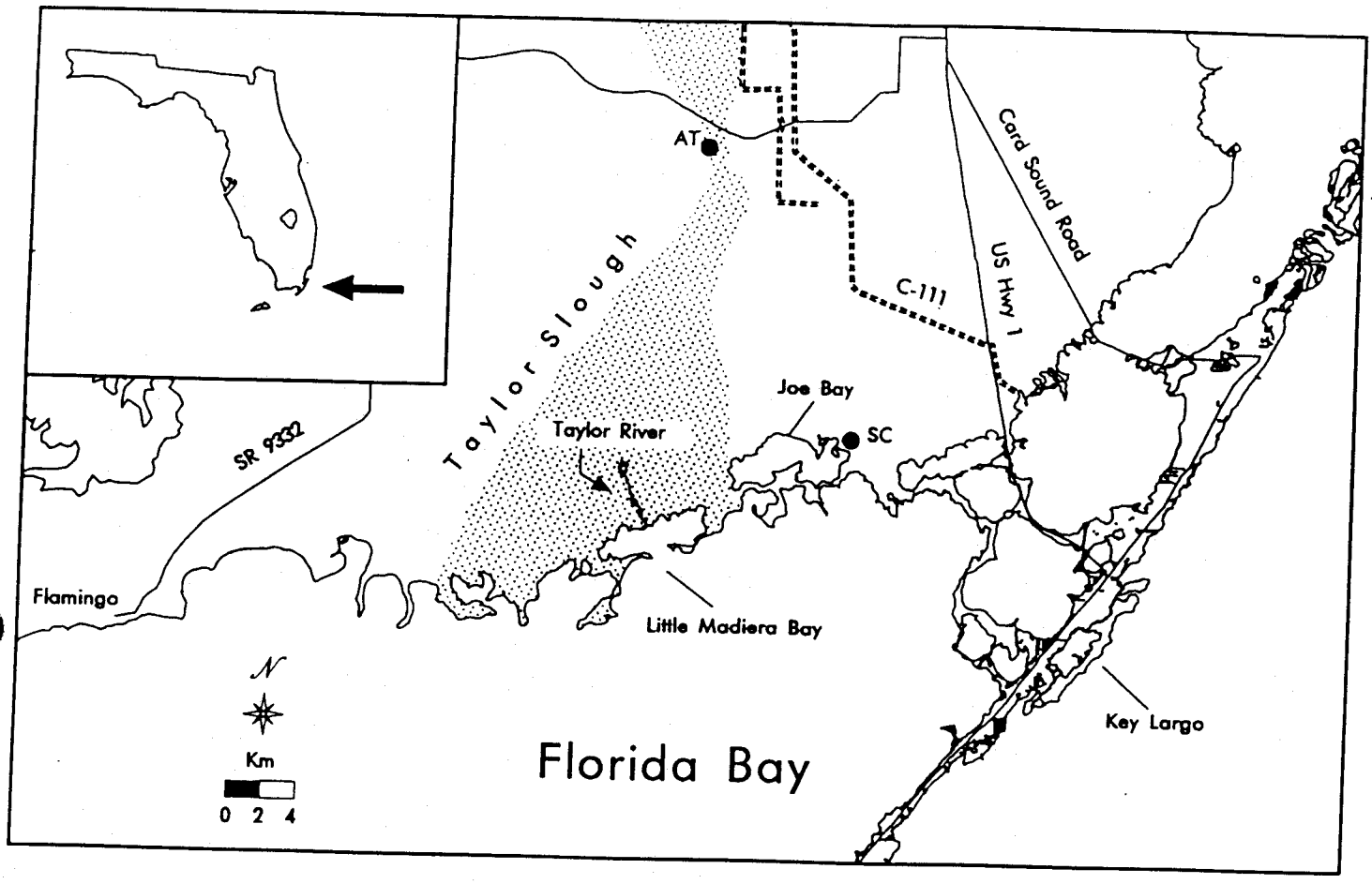


Figure J.1. Map of southeastern Florida showing drop trap locations (black circles) and Taylor River.

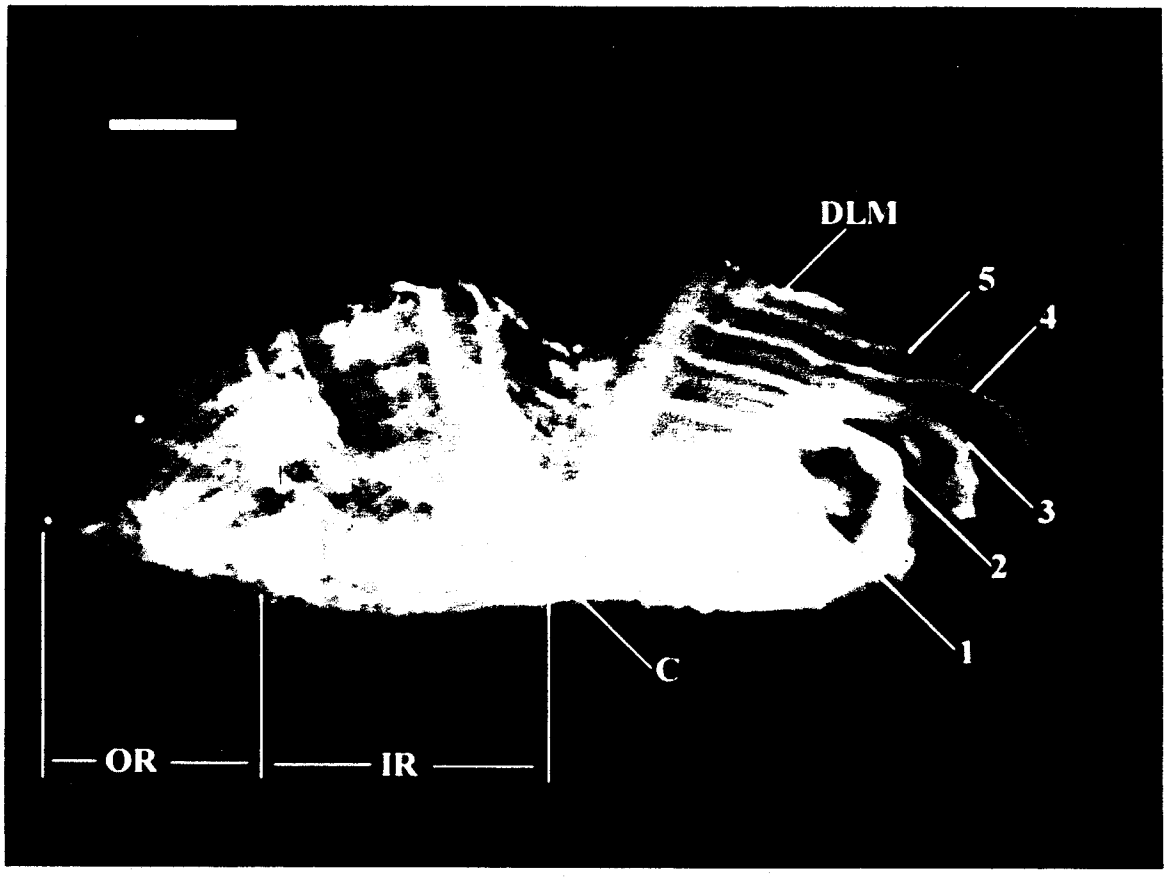


Figure J.2. Transverse section of a six year old Mayan cichlid, *Cichlasoma urophthalmus*, otolith showing the outer region (OR), inner region (IR), and visible annuli. Note that the first annuli corresponds to the fish's second year of growth. A ring corresponding to the first year of growth was not consistently visible and was therefore not counted. Measurements for marginal increment analysis were made on an axis adjacent to the sulcal ridge from the core (C) to the dorso-lateral margin (DLM). Scale bar = 500um.

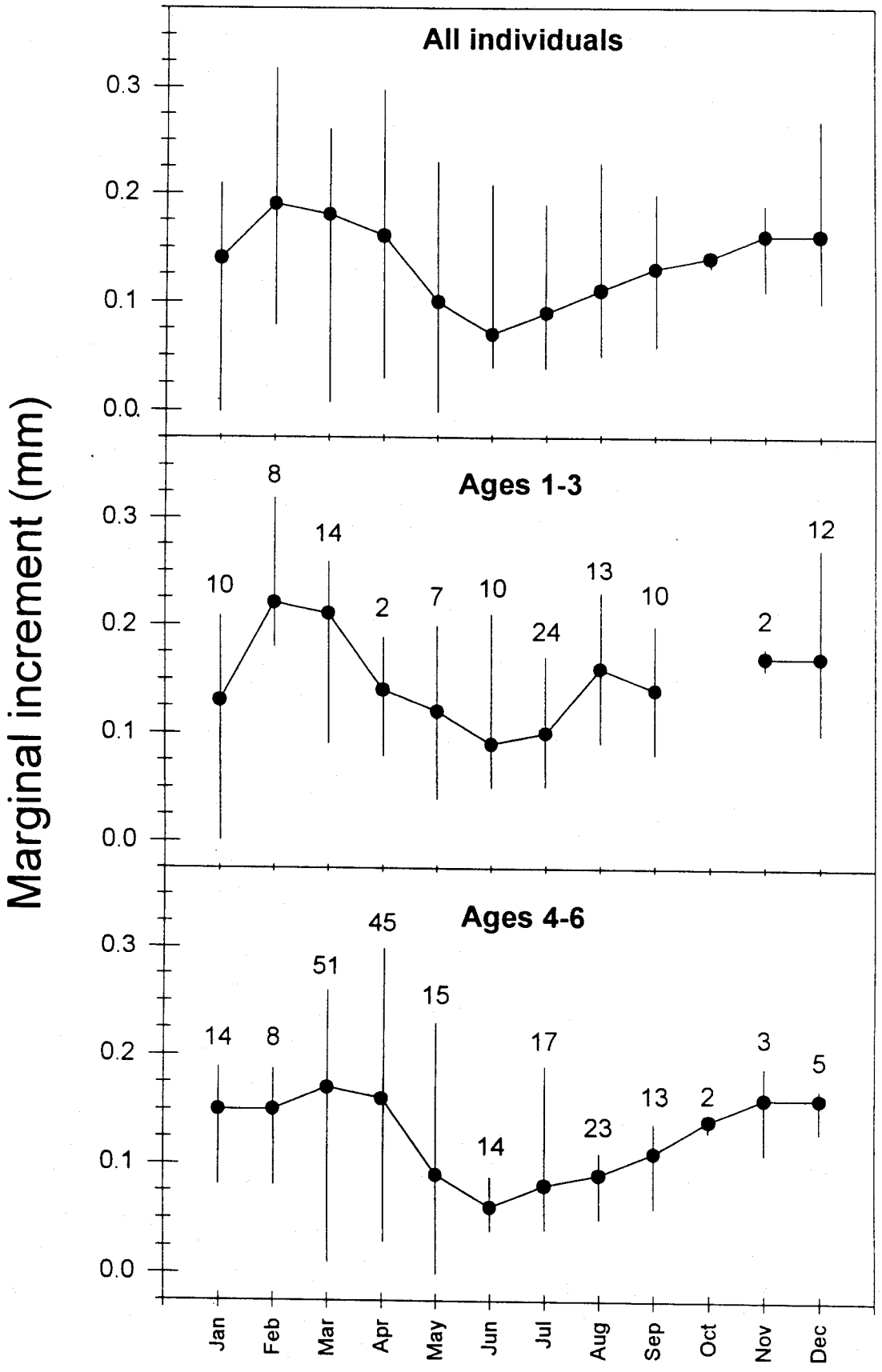


Figure J.3. Monthly mean marginal increment and range for all Mayan cichlids and pooled age classes 1-3 and 4-6. Note the consistent annual minimum in June. Numbers indicate sample size.

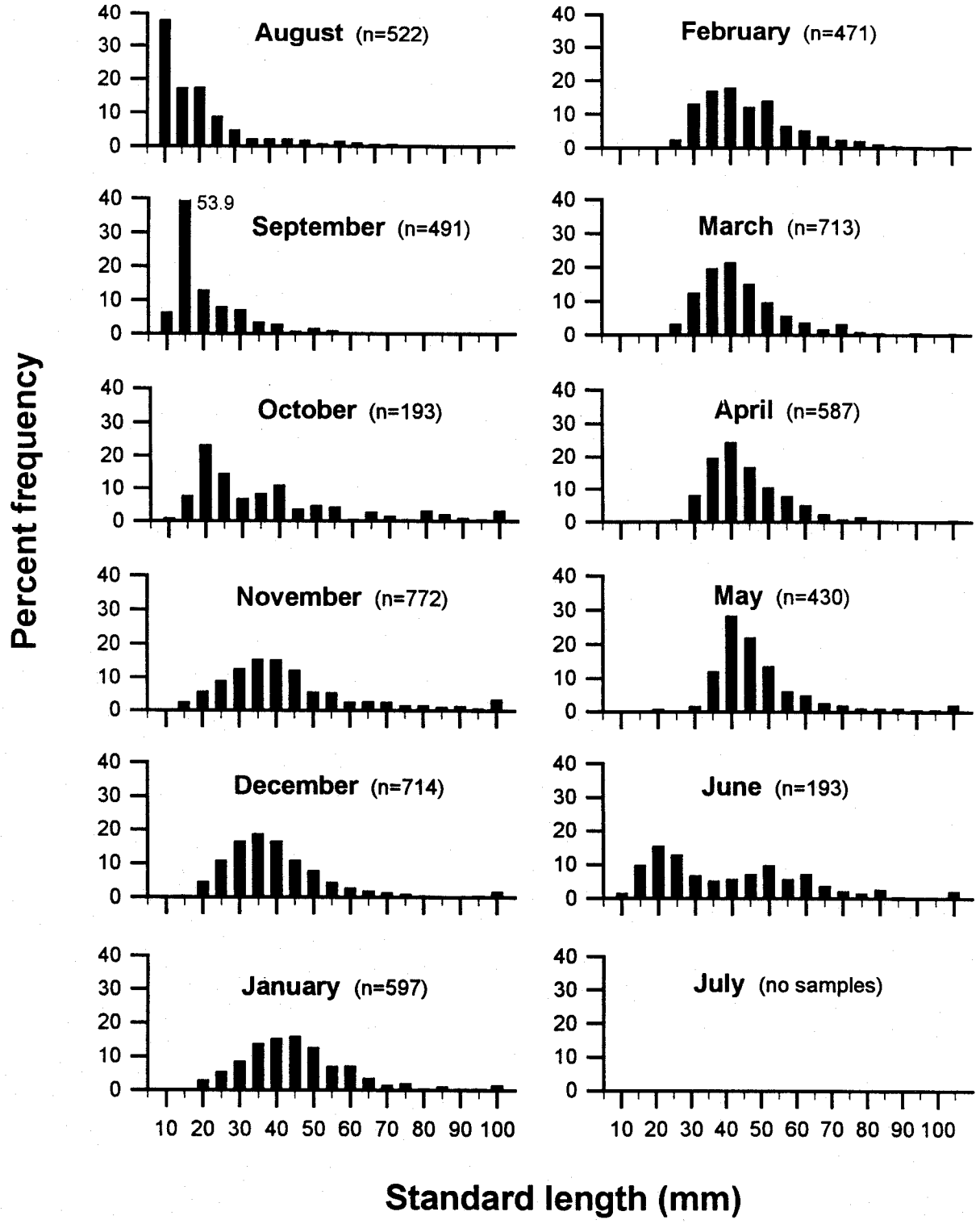


Figure J.4. Pooled length-frequency histograms of Mayan cichlids collected with drop traps from 1990 to 1996.

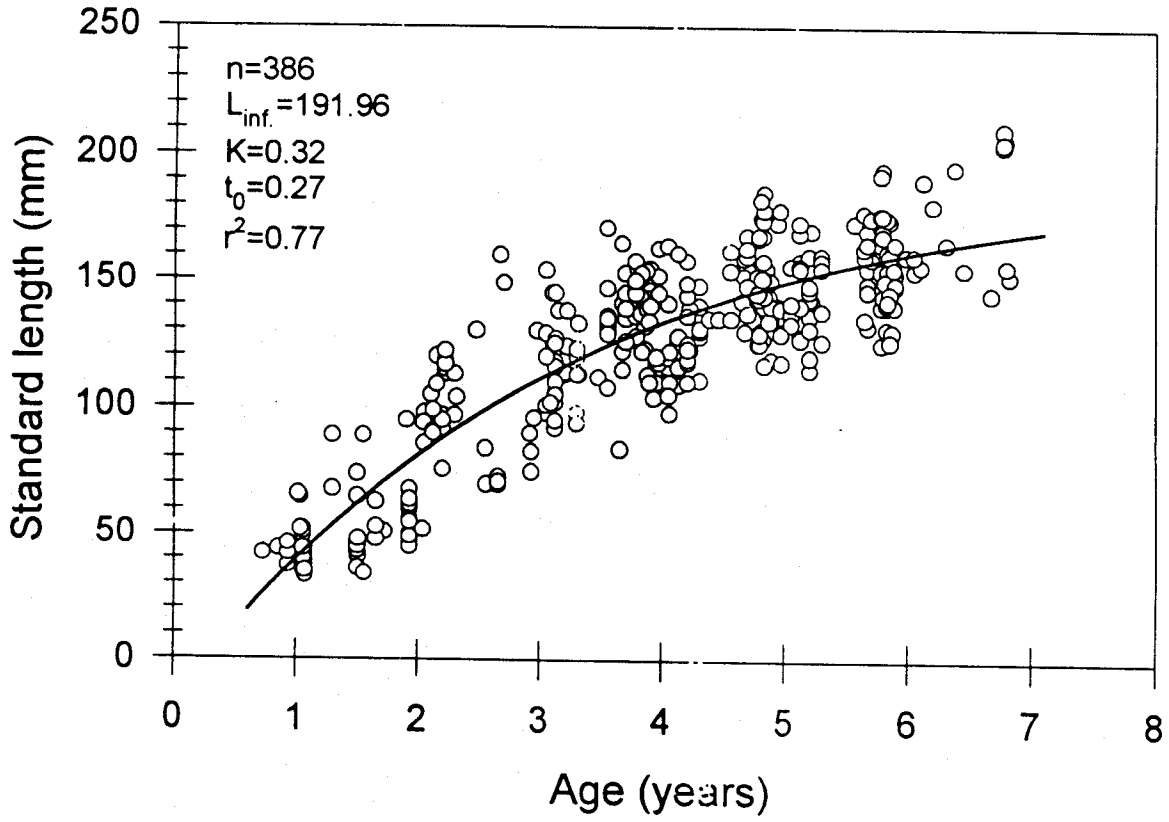


Figure J.5. Observed and predicted lengths at age from the von Bertalanffy growth model for Mayan cichlids.

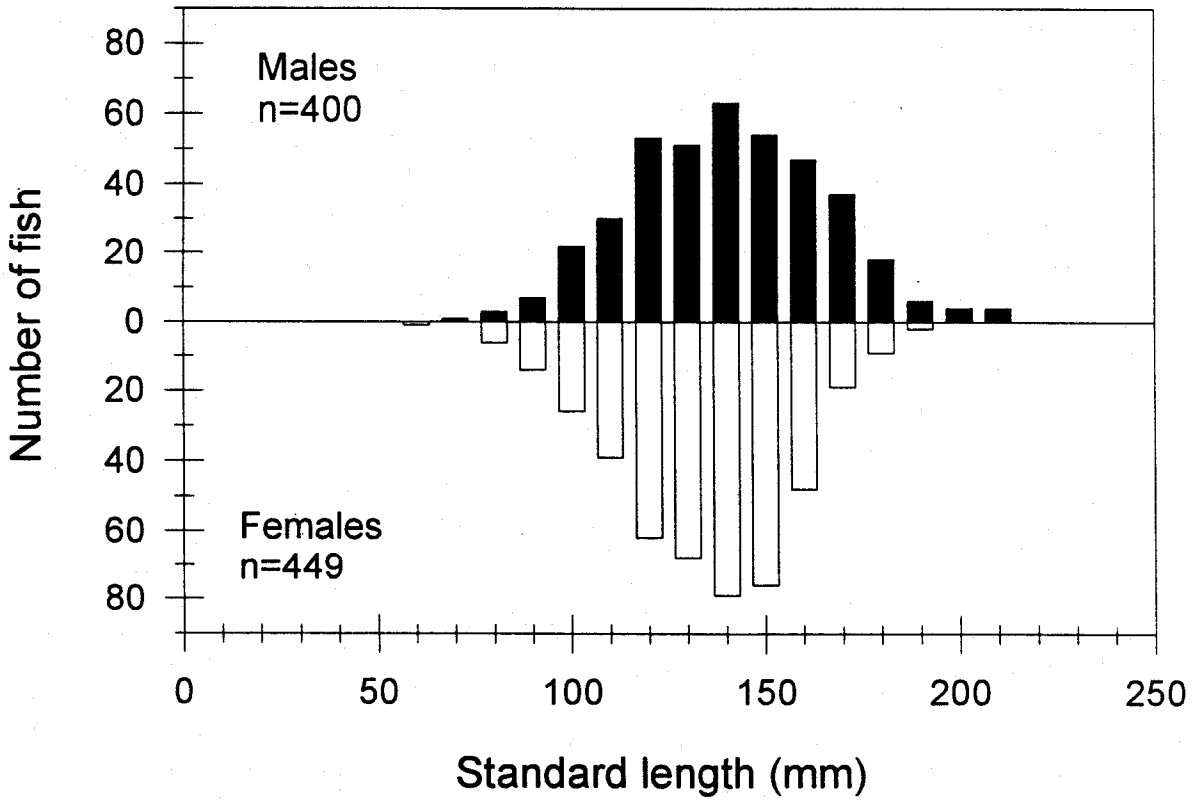


Figure J.6. Length-frequency histograms of male and female Mayan cichlids collected with hook-and-line gear.

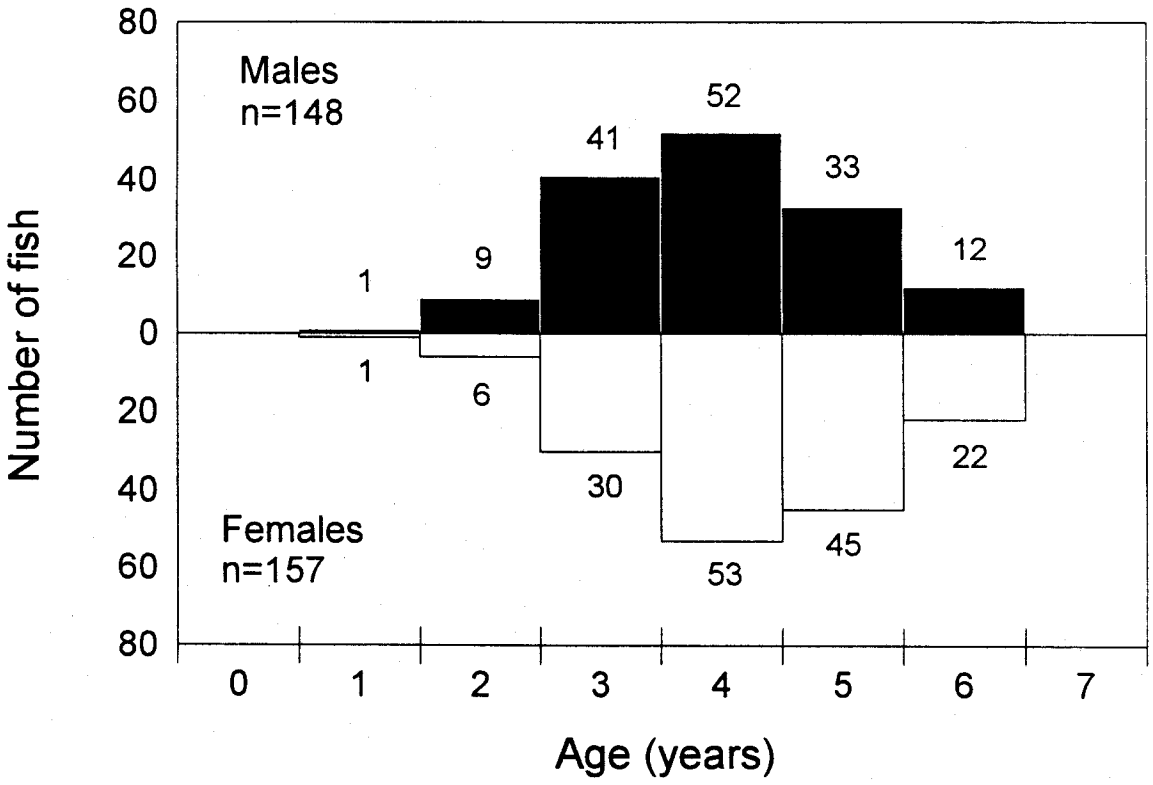


Figure J.7. Age-frequency distribution for male and female Mayan cichlids collected with hook-and-line gear. Numbers indicate sample size.

Editorial Note: Appendix K has been accepted for publishication and should be referenced by the following citation. Reprints are not yet available.

Faunce, C.H. and J.J. Lorenz In Press. Reproductive Biology of the Introduced Mayan Cichlid Cichlasoma urophthalmus in an Estuarine Mangrove Habitat of Southeastern Florida, USA. Environmental Biology of Fishes.

Appendix K. Reproductive Biology of the Introduced Mayan Cichlid Cichlasoma urophthalmus in an Estuarine Mangrove Habitat of Southeastern Florida, USA.

Craig H. Faunce & Jerome J. Lorenz

ABSTRACT

We investigated the reproductive biology of the Mayan cichlid, Cichlasoma urophthalmus, for twenty consecutive months in a southern Florida mangrove creek and compared it to that of available published accounts where this species is native. Mayan cichlid reproduction occurred during a period of the year when physical conditions facilitated the best growth and survival of the young, and was influenced more by changes in water level and salinity than by temperature. Most nests were observed along mangrove shorelines in April. The majority of reproduction and parental care of the young followed in May, and was completed by June when rising water levels flooded shallow habitats and dispersed young-of-year fish. Mayan cichlids in Florida became reproductively mature at a greater size than in native regions, but produced roughly the same number of eggs at a given body mass. The similarity of environmental conditions between southern Florida and areas where Mayan cichlids naturally occur imparts a very favorable reproductive potential for this species in southern Florida, and facilitates their continued presence within the ichthyofauna of the region.

INTRODUCTION

The Mayan cichlid, Cichlasoma urophthalmus, is native to the Atlantic Slope drainages of Mexico's Río Coatzacoalcos basin southward to Nicaragua (Miller, 1966). The species is commercially exploited in freshwater, brackish, and marine environments throughout its range, and is preferred over exotic tilapias in local markets (Martinez-Palacios & Ross 1986, Flores Nava et al. 1989). Consequently, the Mayan cichlid is considered one of the most important and widely appreciated cichlids of the Central American region (Martinez-Palacios et al. 1990).

The Mayan cichlid was first collected in the United States in January 1983 within Everglades National Park, Florida (Loftus 1987). The population at the time was limited to an estuarine mangrove creek system east of Joe Bay (Snook Creek) and a freshwater habitat (Anhinga Trail) some 15 km from the coast (Loftus 1987, Figure K.1). While the exact origin of these populations remains a mystery, Mayan cichlids were not collected at Anhinga Trail from 1976-1981, suggesting that the time of their discovery was made close to the time of their establishment (Loftus & Kushlan 1987, Loftus 1987).

From 1985 to 1996, the Mayan cichlid expanded its range to almost every available habitat of South Florida with varying success. To date, Mayan cichlids have been relatively unsuccessful at penetrating the freshwater marshes of the Everglades (Trexler et al. unpublished), however Mayan cichlids are one of the most abundant large-bodied fishes in the culvert pools and man-made canals of the region[1], and have comprised more than 90% of the total fish biomass in samples collected from estuarine mangrove habitats (unpublished data). Currently this species inhabits Florida waters in the area south of US Highway 41, from Chokoloskee to West Palm Beach and continues to predominate in freshwater canals and mangrove habitats (Shafland 1996, Jim Williams personal communication).

The proliferation of Mayan cichlids within Florida waters has economic and ecological importance. Because individuals up to 20 cm standard length are easily caught on hook and line, fight hard on light tackle, and have an attractive appearance, Mayan cichlids currently support a limited sportfishery (Shafland 1996). The abundance of this fish in areas previously utilized by native fishes has resulted in new interactions between native fishes and introduced Mayan cichlids that may result in profound alterations to the native community (Taylor et al. 1984).

Despite the importance of the Mayan cichlid in Central America and in Florida, there is little known about the basic life history of this species. Information regarding the age, growth, reproduction, and habitat use of the Mayan cichlid is required before we can properly determine what impact this species has on native fishes. While the spawning season, fecundity, and size at reproductive maturity have been described for the Mayan cichlid in native habitats (Caso Chavez et al. 1986, Martinez-Palacios & Ross 1992), these data in Florida have only been inferred from

limited empirical data (Loftus 1987). To address this deficiency, we determined the basic attributes of the reproductive biology of Mayan cichlids in a mangrove habitat of southern Florida, and compared these data to available published accounts. This paper provides a first detailed account of the spawning cycle of Mayan cichlids from nest formation to the cessation of parental care, and relates these events to possible environmental cues.

STUDY SITE

Taylor Slough is the central drainage basin for the southeastern Everglades and carries freshwater south through the mangrove ecotone to northeastern Florida Bay. This basin is critical habitat for a variety of protected species (e.g. American crocodile, Crocodylus acutus, American alligator, Alligator mississippiensis, Bald Eagle, Haliaeetus leucocephalus, West Indian manatee, Trichechus manatus, and numerous wading bird species) and may be important as a fisheries replenishment zone (McIvor et al. 1994, Bohnsack 1996). The largest point-source of freshwater from this basin into Florida Bay is Taylor River (25°11.40'N, 80°38.34'W), a nontidal creek dominated by red mangroves Rhizophora mangle (Figure K.1). The width of Taylor River ranges from constrictions of less than two meters to large 'lakes' several hundred meters across. The flora, fauna, and environmental conditions at Taylor River are largely representative of the mangrove ecotone of northeastern Florida Bay (Lorenz et al. 1997). Due to the sensitive nature of the habitat, Everglades National Park has closed Taylor River to the public as part of the Everglades Crocodile Sanctuary, thereby limiting human activity to scientific research.

Two major wetland types exist along the length of Taylor River. The centrally located creek is the deepest habitat available to fishes and is vegetated by riverine mangrove forest (Lugo & Snedaker 1974). Peripheral to the main creek is an expansive, seasonally inundated mangrove flats habitat. This shallow habitat (approximate maximum depth is 30 cm) is vegetated by dwarf mangrove forest (Lugo & Snedaker 1974) and is characterized by short (0.5–2.0 m), widely spaced (0.5-5.0 m) red mangroves that increase in size and height with proximity to the central creek. A variety of submerged and emergent wetland macrophytes occur seasonally in both the creek and flats habitats (unpublished data).

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[1] Howard, K.S., W.F. Loftus & J.C. Trexler. 1995. Seasonal dynamics of fishes in artificial culvert pools in the C-111 basin, Dade County, Florida. Final Report, South Florida Research Center, Everglades National Park,

METHODS

Environmental conditions. Average daily water level, salinity, and temperature measured in the creek was obtained from a nearby gauge operated by Everglades National Park (TR: 25°13.28'N, 80°39.11'W). Average daily water level at the headwaters of Taylor River was measured with a Telog© 2108 potentiometric recorder with a float and pulley design that had been calibrated to read zero when the flats were dry. Sunrise and sunset times on days 1, 15, and 25 of each month were used to interpolate the number of daylight hours for the entire study.

Nesting. Beginning in June 1996, we began examining a portion of flats and creek habitats from an aluminum jon boat for the presence of Mayan cichlid nests. Clear water conditions allowed us to also record the presence of guarding parents, eggs, or broods in or around the nests. Whenever possible, these were collected using a 6' diameter cast net or 6" aquarium net. Surveys were conducted at weekly intervals and continued until three consecutive trips failed to yield new nests. These areas were then examined approximately every six weeks until weekly surveys were resumed on 1 March 1997. On 23 April 1997, the portion of flats and creek habitats to be examined was expanded northward to include a large open body of water previously unexplored. All newly discovered nests were marked with a numbered PVC pole and the longest axis, shortest axis, depth of the depression, distance to the nearest nest, and distance to the nearest shoreline mangrove tree was measured.

Reproduction. Lorenz et al. (1997) determined that cichlids larger than 70 mm standard length rarely inhabit the flats habitat of Taylor River. Subsequent underwater visual surveys confirmed that larger cichlids were confined to the deeper waters of the creek habitat (unpublished data). Consequently, our sampling of Mayan cichlids was limited to using hook-and-line gear in the creek habitat, because this technique was found to be the most practical for collecting cichlids in mangrove prop-root habitats and was comparable to other studies (Martinez-Palacios & Ross 1992). Fish were caught on hooks (size 10 to 2) baited with pieces of shrimp (Penaeus spp.) at fixed and random points in Taylor River and immediately placed on ice. Monthly collections were made from March 1996 to October 1997 and continued on subsequent days until approximately 40 fish ranging from 10 to 20 cms standard length were obtained.

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We measured the standard length (SL) and total length (TL) of collected Mayan cichlids to the nearest millimeter, blotted them dry and weighed the body, gonads, and liver to the nearest tenth of a gram. The sex of each individual was identified and the gonads were assigned a developmental stage based upon macroscopic examination. Testes were given a stage of development based on the criteria used by Arthington & Milton (1986). Ovaries were allocated a developmental stage according to the criteria in Table K.1. Gonads from both sexes were subsequently preserved and stored in 10% formalin within 24 hrs of capture. The fecundity (# ova) of gravid females was estimated by separating oocytes from the lumen following Lowerre-Barbieri & Barbieri (1993) and directly counting the number of mature oocytes (= yolk present) in both preserved ovaries. The relationship between body mass and fecundity was determined using linear regression procedures and an F-test of slopes (Sokal & Rolf 1981) was used to compare this relationship to that calculated by Martinez-Palacios & Ross (1992) for Mayan cichlid populations in Mexico.

Histological preparations were made from 45 testes and 46 ovaries representing each stage of development to check the accuracy of macroscopic staging and to better discriminate between mature and immature fish. Histological preparations were also made if a fish's sex or developmental stage was uncertain. To prepare a gonad for histological examination, a small sample (< 0.5 cm thick) was taken from the central portion of the preserved left gonad, embedded in paraffin, sectioned to 6-μm thickness, stained with Mayer's haematoxylin and eosin Y, and mounted on a microscope slide (Hinton 1990).

A maturity schedule was developed for females by grouping fish into 10 mm size classes, determining the proportion of mature fish (> stage 3) in each size class (N), and fitting a logistic curve to the observed values of N. The logistic curve was first linearized by log transformation, and linear regression procedures were used to determine the slope and y-intercept (Krebs 1978). The logistic curve was used to determine the length that 50 and 95 percent of Mayan cichlids become mature (L_{50} and L_{95} respectively). The relative investment of energy into reproduction and body reserves over time was assessed with gonadosomatic (GSI=gonad weight/body weight*100) and hepatosomatic (HSI=liver weight/body weight*100) indices. Mean monthly GSI and HSI values exclude individuals less than L_{50} in order to eliminate immature fish from analyses (Wilk et al. 1990).

All lengths reported here are standard lengths. Linear regression procedures were used to determine the relationship between total length and standard length for Mayan cichlids in Taylor River. This relationship was used to convert lengths reported in other studies for proper comparison with our results.

RESULTS

Environmental conditions. Daily average water temperature and hours of daylight were related and increased together from March to June 1996, decreased to minimal values in December and January 1997, increased again until June, and decreased to November (Figure K.2a & Figure K.2b). Although water levels were higher in 1997 than in 1996, a definite wet-dry seasonal cycle was observed in both years. Water levels were lowest from March to June and highest from mid-June through October (Figure K.2c). Salinity closely followed the wet-dry seasonal cycle of water level (Figure K.2d). The period from March to June was characterized by elevated salinities in both years, while salinity remained at or near zero when water levels were relatively high from June 1996 to March 1997 and June to November 1997 (Figure K.2c).

Nesting. Two abandoned nests and several broods were recorded in June 1996 and no new nests were found until 14 April 1997. Twenty seven more nests were recorded three days later (Figure K.3). Subsequent surveys of the area did not yield any new nests, however shorelines further north revealed 39 nests on 22 April, and 31 more on 1 May (Figure K.3). The number of nests rapidly decreased after this time and no new nests were observed after 20 May 1997. These data indicate that most nesting by Mayan cichlids in Taylor River occurred during April and May and was completed by June (Figure K.3).

Nests consisted of oblong, shallow depressions in the spongy root mass of red mangroves. Most nests were less than ten centimeters deep and between 10 and 45 cm at their widest (Figure K.4). Cichlid nests were often found in close association with one another. Most nests (83%) were within 45 cm of another nest, and a smaller peak in the frequency distributions was seen at 105 cm (Figure K.4). The modal distance of a nest from a shoreline mangrove tree was 60 cm and 90% of nests were within 150 cm.

Reproduction. We macroscopically examined 832 fish for reproductive maturity. The accuracy of macroscopic staging of gonad maturity was sex and stage dependant. Microscopic

examination of testes from fish 82-182 mm revealed that all individuals had undergone spermiogenesis, indicating maturity (Grier 1981, Murphy & Taylor 1990). However, macroscopic staging had correctly identified only 28% of males as mature or immature. In light of these results, staging and length at maturity for males could not be determined.

The macroscopic staging criteria used for females was much more accurate than for males. Microscopic examination of ovaries from fish 77-165 mm indicated that macroscopic staging correctly identified all of stages 1 (immature), 3 (mature), and 4 (gravid). Mature oocytes from gravid females and eggs from nests indicated that hydration does not occur in Mayan cichlids since the negatively buoyant mature oocytes are laid in the nest to be fertilized by the male (Breder & Rosen 1966, Table K.1). Unfortunately, stages 2 (developing) and 5 (Spent or Recovering) were misinterpreted by macroscopic staging in 30% of the cases. To correct this error, all ovaries originally classified as these stages were histologically examined and given a final stage of maturity. The final maturity schedule for females was: $N=1/(1+e^{((-0.12*SL)-15.26)})$ ($n=9$, $r^2=0.86$) and the L_{50} and L_{95} were 127.2 and 151.7 mm respectively (Figure K.5).

Gonadosomatic indices indicate most spawning activity of Mayan cichlids begins in April and ends in June (Figure K.6). Female GSI in 1996 increased from 0.49 in March to 1.84 in May and returned to near minimum values by July. Female GSI values rose again in March 1997 from 0.75 to peak at 1.93 in May (Figure K.6). Although smaller in magnitude, male GSI showed a temporal pattern similar to that of females and peaked at 0.09 in May 1996 and at 0.15 in April 1997 (Figure K.6). These data demonstrate that a single annual GSI maximum occurred during April-May in each sex.

Hepatosomatic indices demonstrated that distinct morphological changes in the liver occur annually and are associated with reproductive activity and gonad development. Male and female HSI values in both years were minimal when GSI was elevated (April to June), increased immediately following the end of the reproductive season, and remained high throughout the winter (Figure K.6). These data indicate that excess energy gained by Mayan cichlids is used for reproduction during the summer months, and is stored as glycogen in the liver during the winter.

Fecundity ranged from 2,402 to 6,323 ova/female for fish of sizes 133-159 mm. The linear relationship between the number of ova and fish weight (WT) was: fecundity=677.5+(21.33*WT) ($n=13$, $r^2=0.40$) and was not significantly different ($F_{0.25[1,60]} \geq 0.05$)

from the relationship given by Martinez-Palacios & Ross (1992) for Mayan cichlids in Mexico (Figure K.7). The relationship between standard length and total length for Mayan cichlids in Taylor River was defined by the equation: SL=(TL*0.763)-0.128 (n=961, r^2=0.99).

Recently spawned broods of cichlids were easily identified by the presence of their guarding parents, whose bright colors and behaviors of calling and defending the young are quite conspicuous (Baerends & Baerends-van Roon 1950, Martinez-Palacios & Ross 1992). The first brood was recorded on 17 April 1997 and the number of new broods peaked on 20 May 1997 (Figure K.8). Brood fish ranged in size from 5 mm free embryos (Balon 1990) to 19 mm juveniles. If the parents were chased away, the brood was immediately preyed upon by gulf killifish, Fundulus grandis, redfin needlefish, Strongylura notata and sub-adult Mayan cichlids. No broods were observed after 4 June 1997, indicating that most reproduction had finished by this time.

DISCUSSION

Our data show that nesting activity peaked in April, was followed by a peak in GSI in May and broods were present in May and June. From this data we can state with confidence that most reproductive activity of Mayan cichlids in Taylor River occurred between April and June. These results agree with Loftus (1987) who observed nesting during April, May and June, but could not find evidence of continued spawning in July. In Mexico, Caso Chavez et al. (1986) reported that peak reproductive activity of this species in Laguna de Terminos occurred in June and that no reproductively active females were collected after September. Likewise, data presented by Martinez-Palacios & Ross (1992) indicated that the reproductive season in Celestun Lagoon, Mexico began in April and was not completed until the end of September. Therefore it seems that while the reproductive activity of Mayan cichlids in Taylor River and Mexico is initiated and peaks at similar times of the year, the reproductive season in Mexico is longer in duration.

Differences in the duration of the reproductive season between populations of Mayan cichlids in Mexico and in Taylor River may be due to differences in their life history style (Noakes & Balon 1982). Estimates of the size at maturity (≥ stage 3) for female Mayan cichlids in Taylor River and Mexico greatly varied. Females reached a greater size at maturity in Taylor River (118 mm SL) than in Laguna de Terminos, Mexico (80 mm TL = 60.1 mm SL, Caso Chavez et al.

1986) and in Celestun lagoon, Mexico (102 mm SL, Martinez-Palacios & Ross 1992). Female L_{50} at Taylor River (127 mm SL) was also larger than the L_{50} (117 mm TL = 89.1 mm SL) reported from Laguna de Terminos (Caso Chavez et al. 1986). Adult mortality of Mayan cichlids in their native range is likely to be higher than in Taylor River, where fishing is not allowed. The selective removal of large adults from Mexican populations through fishing would select for a more altricial life history style (Noakes & Balon 1982) characterized by the smaller size at maturity observed. The larger adults in Taylor River would be slower to produce additional spawnings in a single season compared to the smaller fish in Mexico (Barlow 1991) and may help to explain the highly synchronous spawning observed in this study.

Although macroscopic staging was ineffective for determining the size at maturity for males, all individuals > 82 mm had undergone spermiogenesis, indicating that the minimum size at reproductive maturity is below this size. Other accounts of the minimum size at reproductive maturity for male Mayan cichlids are not available for comparison.

Using data from this study we can describe a typical reproductive cycle of the Mayan cichlid in relation to seasonal changes in environmental conditions (Figure K.9). From November to April, decreasing water levels concentrate fish and their prey items into deeper creek habitats (DeAngelis et al. 1997). At the height of the dry season (April) adult cichlids form pair bonds, court, and build nests close to mangrove shorelines. Shortly thereafter spawning takes place (May) and the young are released into nearly isotonic salinities. These salinities have been shown to facilitate the best growth by young-of-year cichlids at the temperatures observed (Martinez-Palacios et al. 1990). For a period lasting up to six weeks, the parents guard the brood from predators and feed very little (Barlow 1991, Martinez-Palacios & Ross 1992). When the parental instincts wane in June, summer rain storms have raised water levels to flood the flats habitats, salinity has fallen to 0‰, and temperatures closely match the preferred temperature (32.8°C) for young-of-year cichlids held in freshwater (Stauffer & Boltz 1994). The consequence of these events is that young-of-year Mayan cichlids can now exploit a new, warm habitat that offers refuge from large-bodied predators. While these factors all aid in the survivorship and growth of the young, the adults have expended large amounts of energy and now need to replenish their energy reserves. Given sufficient food, smaller adults with a higher metabolism may be able to

quickly return to breeding condition, and reproduce a second time (Barlow 1991). For most Mayan cichlids in Taylor River however, one spawn per season seems to be the norm.

The fact that the reproductive season for Mayan cichlids in Taylor River began in April and ended in June suggests that they respond to some sort of change in the environment during these months. Although no temperature data was presented, Martinez-Palacios & Ross (1992) noted that the reproduction of Mayan cichlids occurred throughout most of the year and appeared to stop when temperatures dropped below 24°C. From those data they concluded that temperature is one of the most important environmental factors regulating the reproductive cycle of this species. In our study the majority of reproduction stopped well before temperatures dropped below 24°C (October), suggesting temperature may not be as important as previously thought. Based upon our results, it would seem reasonable that the cue for Mayan cichlids to begin spawning is increasing salinities, however changes in salinity do not explain why a similar reproductive season has been reported in exclusively freshwater habitats (Loftus 1987, Lament 1999). Another possible cue might be decreasing water level, but inter-annual variability in water level can be great (Lorenz 1999) while the timing of reproduction seems relatively constant. The simplest possible environmental factor that could trigger the onset of reproduction is increasing daylight; many fishes have been shown to respond to changes in daylight as a proximal cue for reproduction (Munro et al. 1990). The ultimate cue for Mayan cichlids to initiate spawning in April may be that increasing daylight signals that salinity will soon be at its highest and that an increase in water level and temperature are imminent. Further study is needed to determine what the exact proximal and ultimate cues that initiate reproduction are in this species.

One consequence of spawning in the late dry season is that there is a greater risk of predation to the brood because low water levels during this time attract and concentrate potential predators. Although the evolution of advanced parental care in Mayan cichlids reduces these effects, increased predation risk may explain why inter-nest distances were so small. Aggregate nesting was observed on several occasions in this study, and has been observed in other cichlid species where same-species predation is common (Townshend & Wooten 1985). While further study is required for confirmation, it is likely that aggregations were formed by smaller adult pairs that cannot adequately defend a nest, while larger adult pairs nested separately.

In conclusion, it is unlikely that an exotic species could adapt so perfectly to the hydrologic cycles of the Everglades in just 15 years post introduction. However it is possible that Mayan cichlids evolved in estuaries that have similar hydrologic and hydrographic conditions to the Everglades/Florida Bay estuary. We propose that Mayan cichlids are pre-adapted to the wet/dry cycle found in southern Florida since the climate of southern Florida has more in common with tropical regions than with any other area in the continental United States (Duever et al. 1994). A comparison of environmental data from Mexican studies (Caso Chavez et al. 1986, Martinez-Palacios & Ross 1992) to those of the Everglades mangrove forest (Lorenz 1999) indicate that these habitats have very similar hydrologic and hydrodynamic regimes. This similarity in environmental conditions imparts a favorable reproductive potential for introduced Mayan cichlid populations and explains their high degree of success within the mangroves of southern Florida (Trexler et al. unpublished).

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Table 1. Developmental stages of gonads in female Mayan cichlids. Microscopic description adapted from Murphy & Taylor (1990).

Stage	Macroscopic description	Microscopic description
1. Immature	Ovaries are fully formed but appear as tiny tubes. Oocytes are not readily visible or appear as very small white or gold flecks. Ovary weight 0.01-0.25g	Oogonia predominate with a few primary oocytes visible.
2. Developing	Grey or yellow gonad is easily recognized as an ovary by the appearance of small oocytes throughout. Gonad weight is generally 0.25-3g.	Primary oocytes dominate; early yolk vesicle and primary yolk granule oocytes present.
3. Mature	Ovaries as large or larger than gut, highly vascularized and approximately 3-5g. Oocytes large (0.5-1.0 mm diameter) and yellow.	Primary yolk granule oocytes dominate; Eocenephillic late yolk vesicle oocytes present. Early yolk vesicle oocytes are usually the least developed cells observed.
4. Gravid	The largest size of the ovaries. Yellow or bright orange gonad is highly distended and occupies almost double the area of the gut. Gonad weight very large (5-10g).	Ovaries contain almost exclusively Eocenephillic late yolk vesicle oocytes; early yolk vesicle oocytes present.
5. Spent or Recovering	Difficult to interpret. Gonad size similar to stage 2. Oocytes of various sizes only seen in portions of the ovary. Pink or clear ovary with clearly distended portions and a high degree of vascularization.	Delta stage atretic oocytes present; tunica thickened with collapsed or empty follicles.

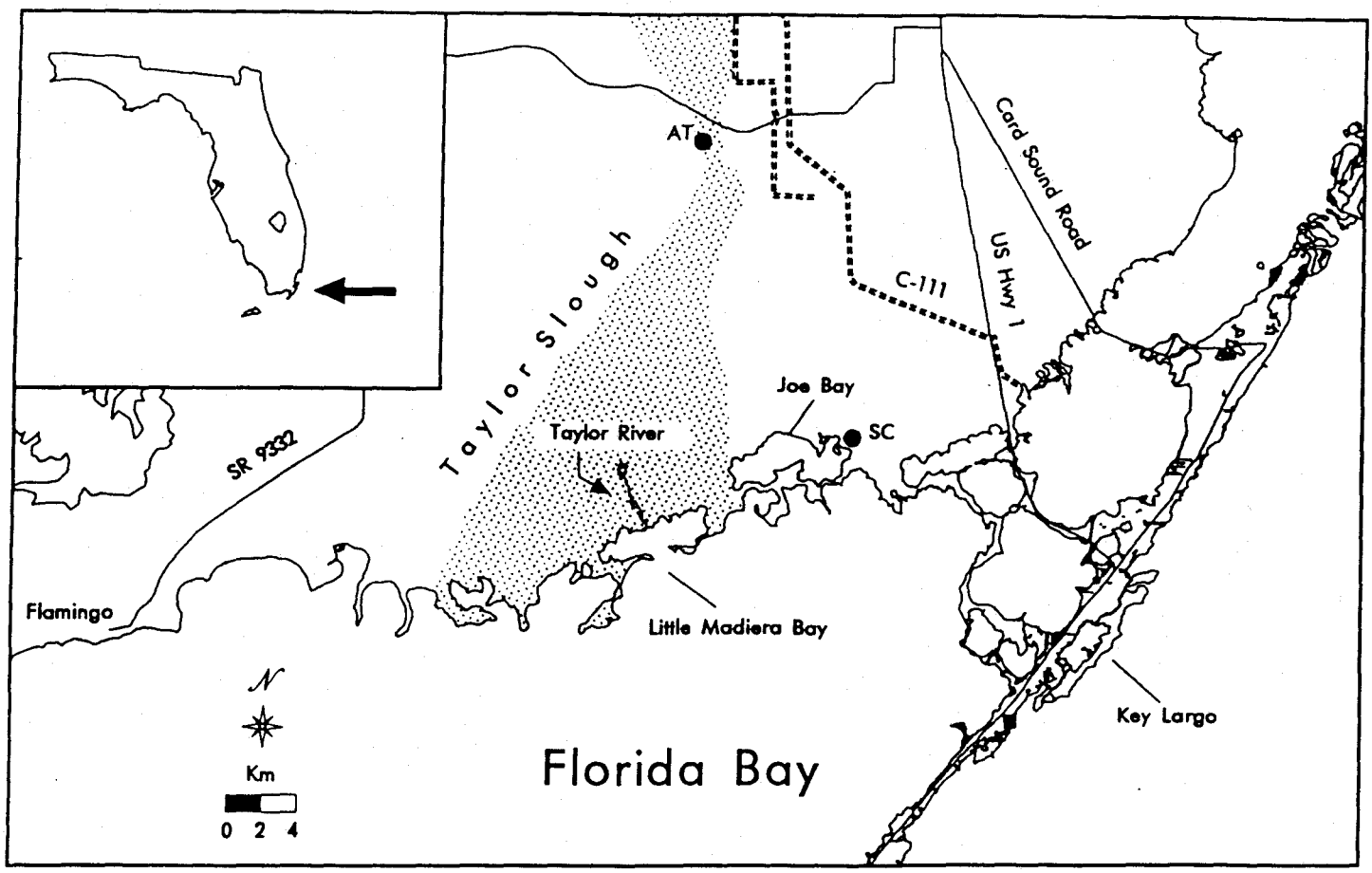


Figure K.1. a – Map of southeastern Florida, showing the location of Taylor River, Snook Creek (SC), and Anhinga Trail (AT).

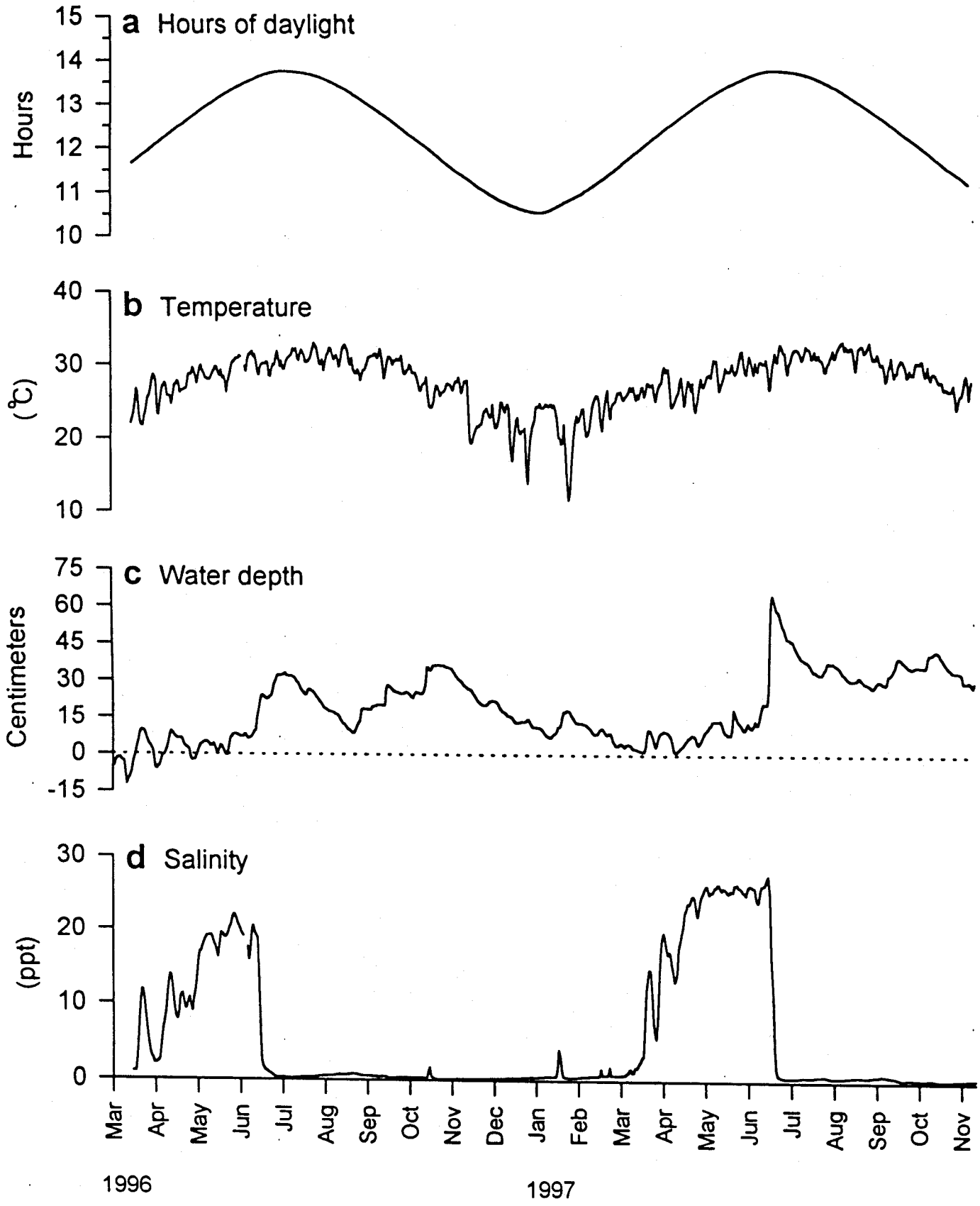


Figure K.2. Environmental parameters measured at Taylor River: a – number of daylight hours. b – average daily water temperature in the creek habitat. c – average daily water depth in the creek, dashed line indicates the level when the flats habitats go dry. d – average daily salinity in the creek habitat.

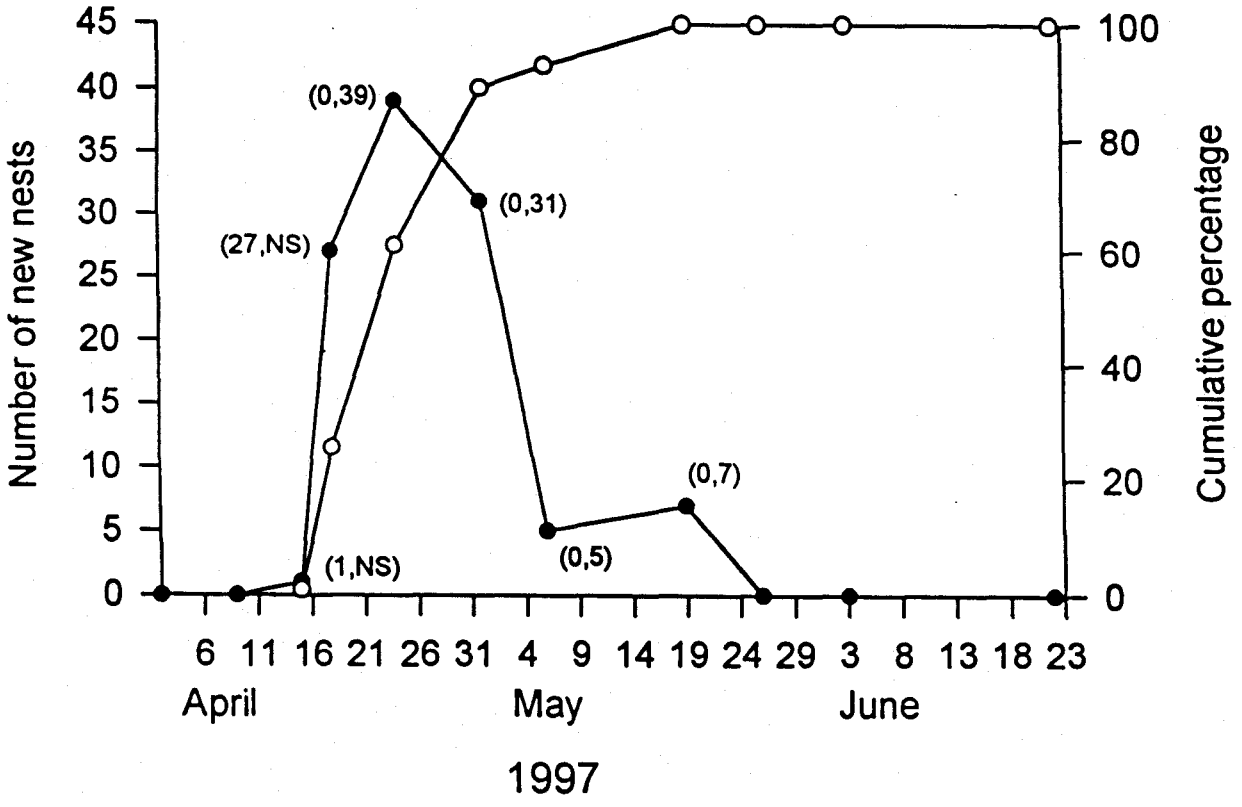


Figure K.3. The number of new Mayan cichlid nests observed in Taylor River during the 1997 breeding season (closed circles) and the cumulative percentage of new nests (open circles). Numbers next to each data point correspond to the number of nests observed in the original survey area and in the expanded survey area respectively (NS=not sampled).

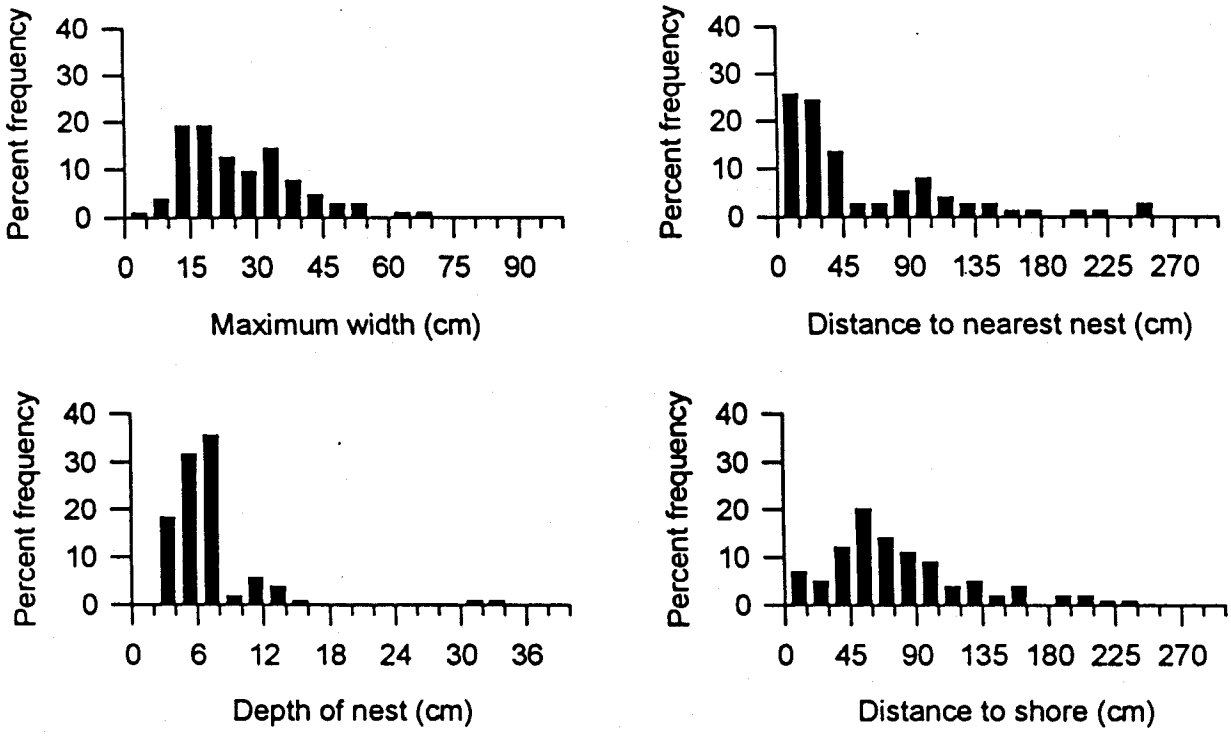


Figure K.4. Percent frequency histograms for various characteristics of Mayan cichlid nests: maximum width (upper left), distance to nearest nest (upper right), depth of nest (lower left), and distance of nest from shoreline (lower right).

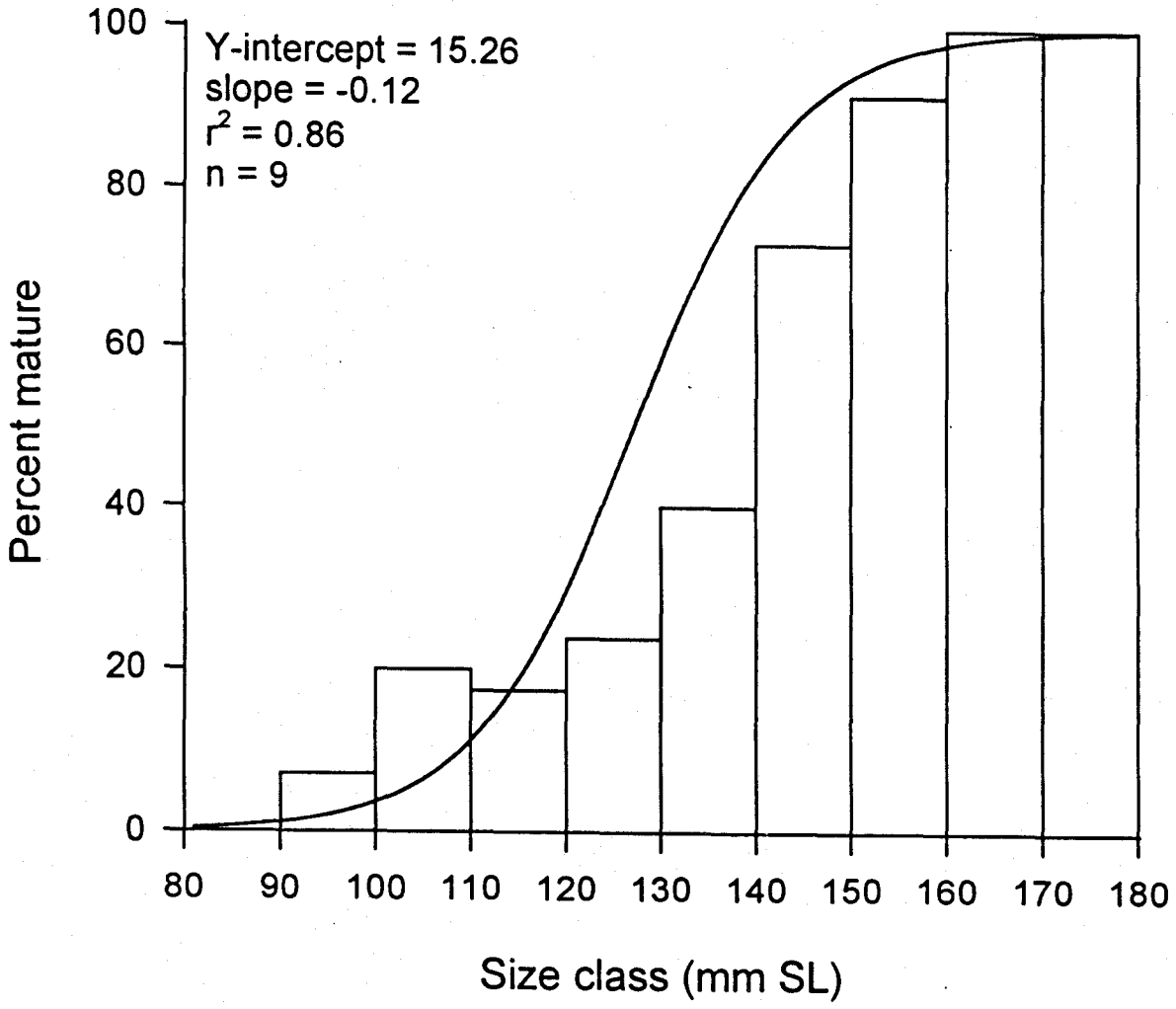


Figure K.5. The percentage of mature female Mayan cichlids in 10 mm size classes (bar) and estimated logistic distribution curve (line).

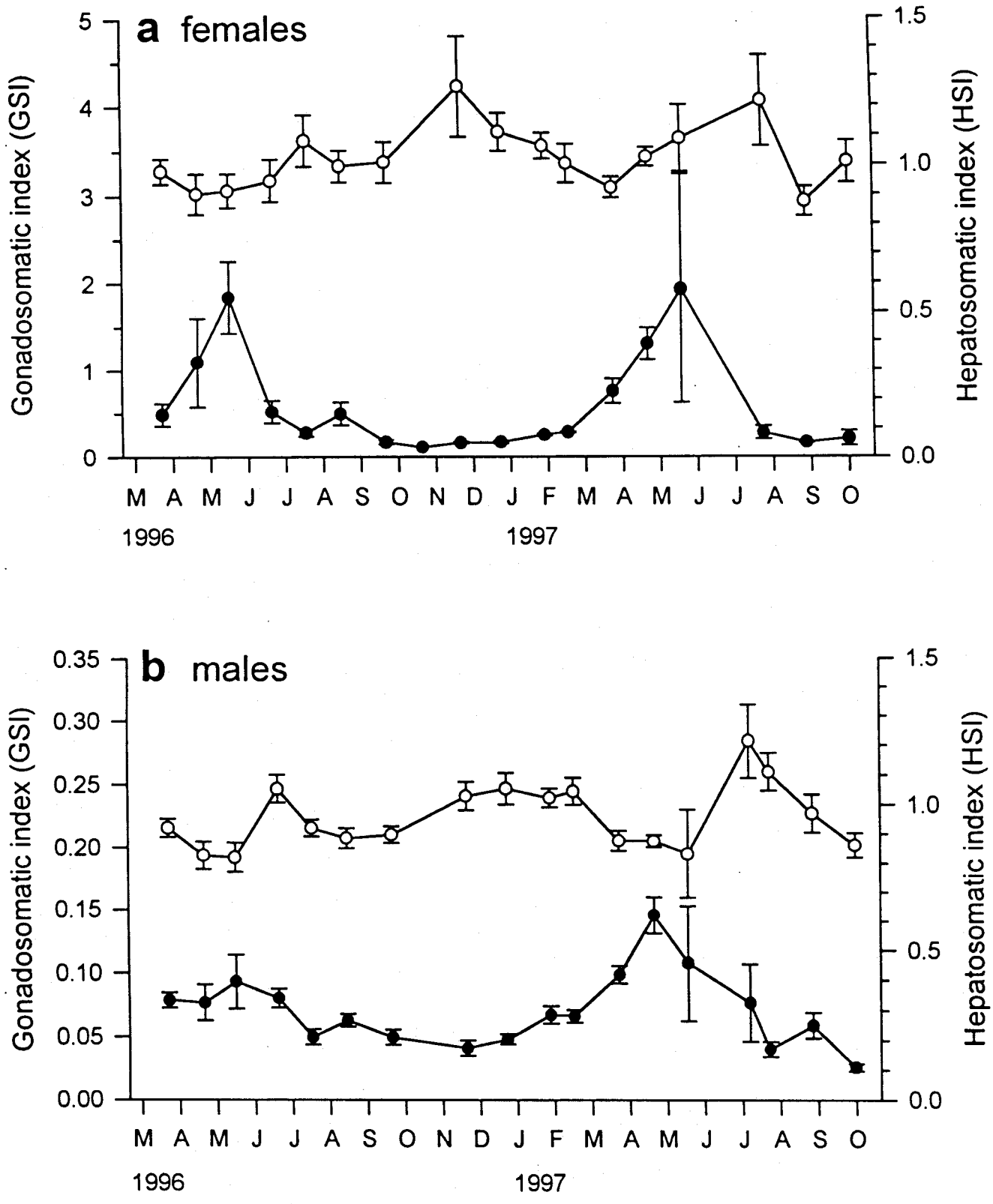


Figure K.6. Gonadosomatic (closed circles) and hepatosomatic (open circles) indices for female (a) and male (b) Mayan cichlids collected in Taylor River.

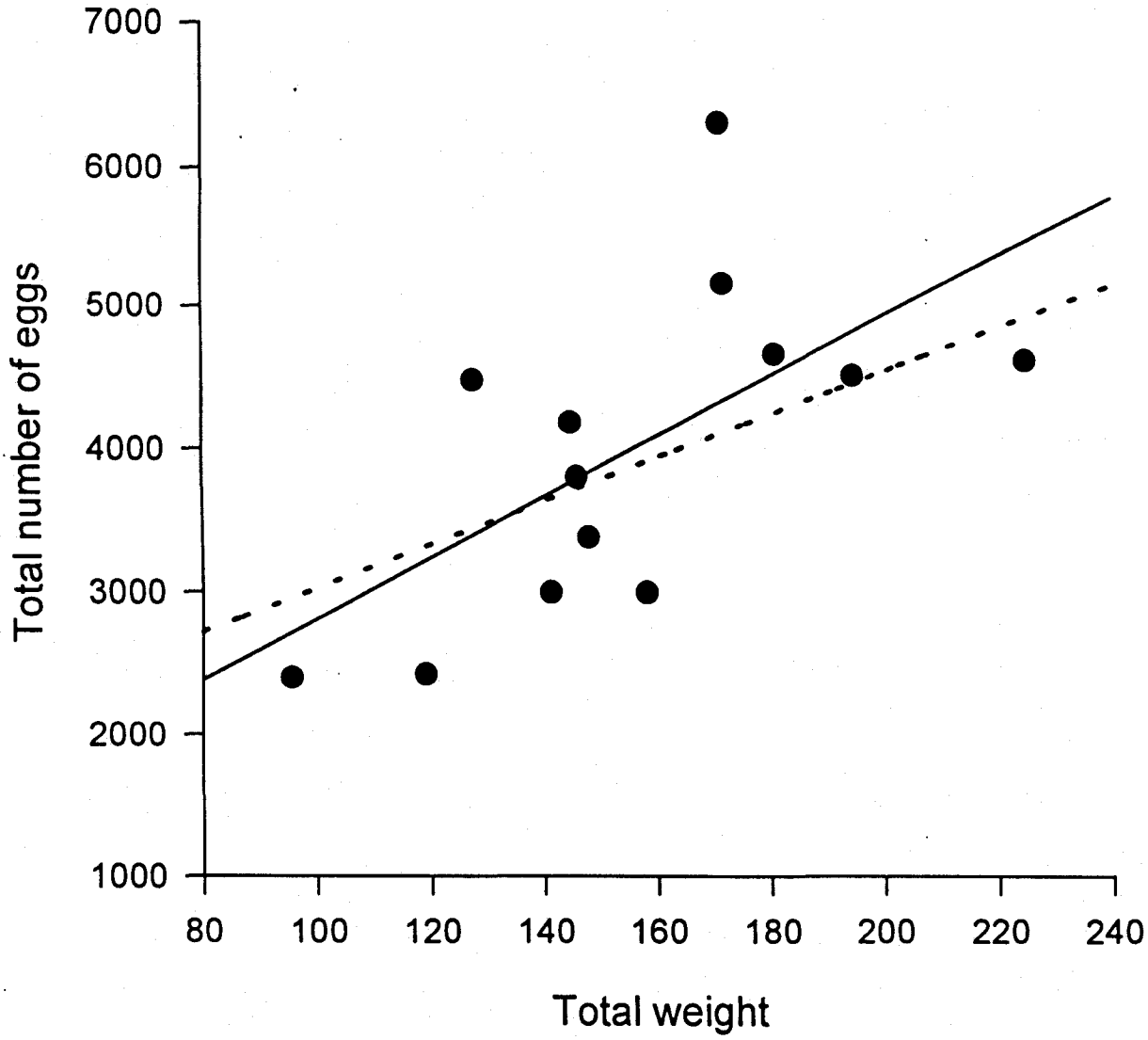


Figure K.7. Fecundity of Mayan cichlids collected in Taylor River. Relationships between fecundity and fish weight are given for Taylor River (solid line) and Mexico (dashed line). Mexican line was generated using the linear equation presented by Martinez-Palacios & Ross (1992).

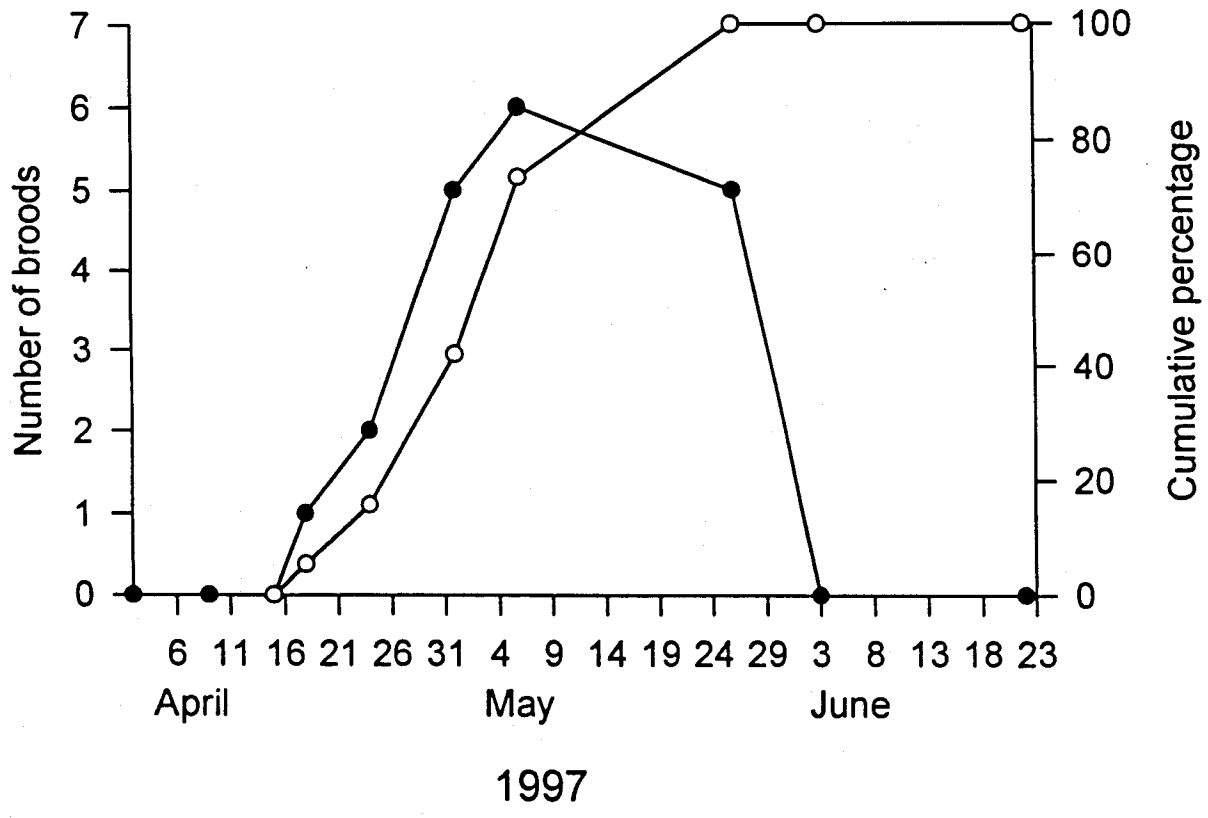


Figure K.8. The number of Mayan cichlid broods observed in Taylor River during the 1997 breeding season (closed circles) and the cumulative percentage of broods (open circles).

Figure K.9. The reproductive cycle of the Mayan cichlid in Taylor River: a - in the late dry season (April) nests are excavated along shorelines vegetated by Rhizophora mangle. b – shortly thereafter spawning takes place and the protection of the brood begins. Couples with broods use calling displays to coral young and will not venture into open water habitats. Typically the brood surrounds the female, while the male patrols nearby and defends against potential predators, including smaller Mayan cichlids. c – after four to six weeks parental care begins to break down (Barlow 1991). During this time water levels have risen to above the level of the flats, enabling inexperienced young to disperse to a warmer habitat virtually free of large predators. d - declining water levels and temperatures during the winter gradually force young-of-year fish into deeper habitats. In March, changes in the environment towards less harsh conditions facilitate reproduction by mature fish, and the cycle begins again.

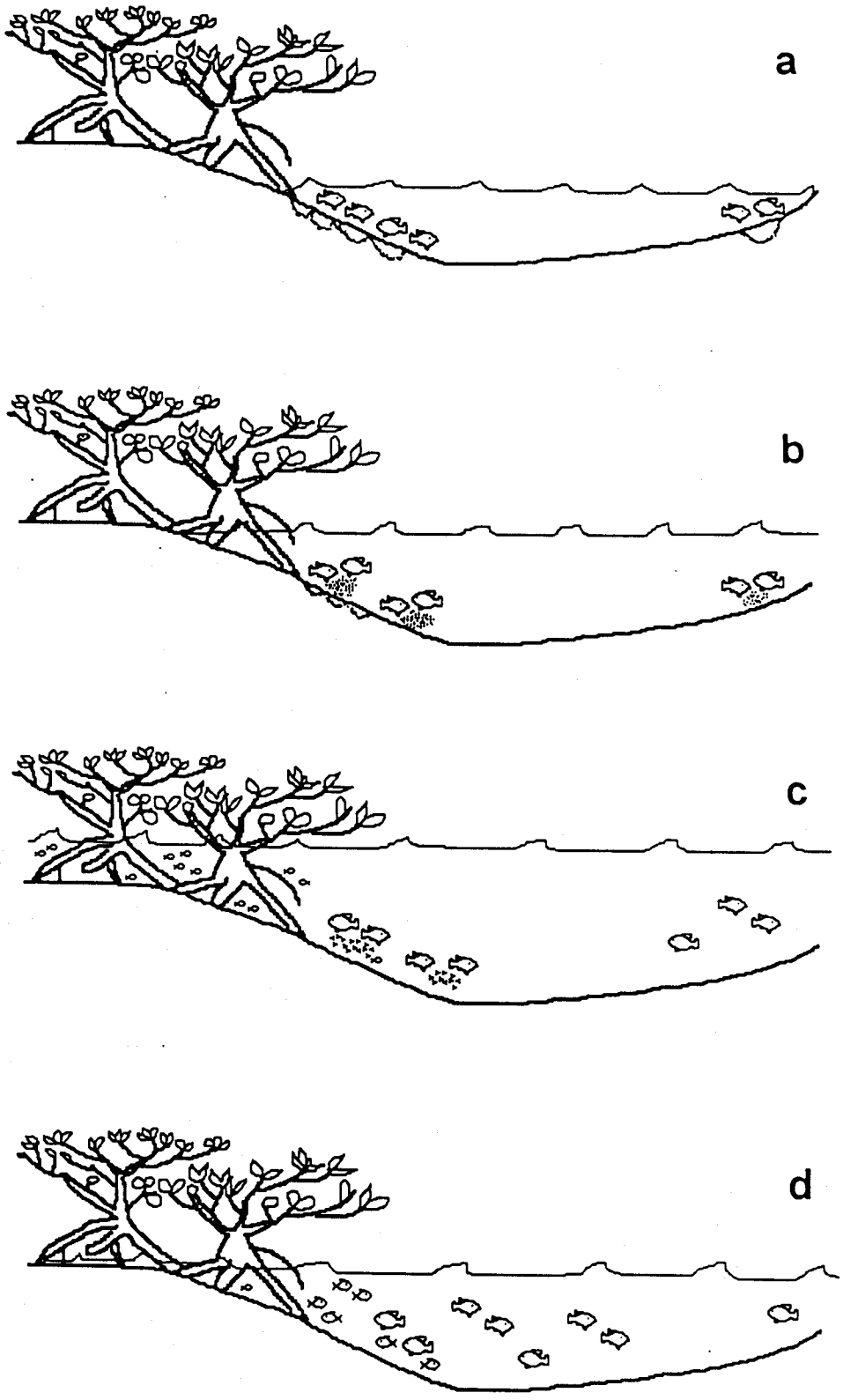


Figure K.9. See previous page for caption

Editorial Note: Appendix J has been accepted for publishication and should be referenced by the following citation. Reprints are not yet available.

Trexler, J.C., W.F. Loftus, F. Jordan, J. Lorenz, and J. In Press. Empirical Assessment of Fish Introductions in Southern Florida, U.S.A.: An Evaluation of Contrasting Views. Biological Invasions.

Appendix L. Empirical Assessment of Fish Introductions in Southern Florida, U.S.A.: An Evaluation of Contrasting Views

Joel C. Trexler, William F. Loftus, Frank Jordan, Jerry Lorenz, and John Chick

ABSTRACT.

We summarized data from several quantitative fish surveys conducted in southern Florida to evaluate the distribution and relative abundance of introduced fishes across a variety of habitats. These surveys encompassed marsh and canal habitats throughout most of the Everglades region, including the mangrove fringe of Florida Bay. Two studies provided systematically collected density information over a 20-year period, and documented the first local appearance of four introduced fishes based on their repeated absence in prior surveys. Those species displayed a pattern of rapid population growth followed by decline, then persistence at lower density. Estuarine areas, natural creeks and adjacent marshes in the southern Everglades, and canals held the largest introduced-fish populations. Relatively undisturbed marshes and alligator ponds distant from canals generally held relatively few individuals of introduced fishes. These patterns suggest that the introduced fishes in southern Florida at present may not be well-adapted to persist in seasonal marshes of the Everglades. Canals are the habitats in which introduced fishes presently in southern Florida reach their greatest abundance. Our analyses provided no evidence of moderate or high densities of these fishes in natural Everglades wet prairie communities, which suggests minimal biotic effects. There is no guarantee that this condition will be maintained, especially under the cumulative effects of future invasions or environmental change.

INTRODUCTION

More than 50 species of fishes have been introduced into southern Florida fresh waters during the past 40 years (Shafland, 1996a; Courtenay, 1997). Prior to human intervention, the

southern tip of Florida from Lake Okeechobee to the coastal mangrove forests was largely covered by the grassy wetlands of the Everglades with seasonally flooded cypress forests to the west. By the 1960's, extensive agricultural and water-management developments had greatly diminished the area of aquatic habitats, decreased the hydroperiod of many wetlands, and added canals that provided permanent aquatic refugia unlike any native habitats (Gunderson and Loftus, 1993). Introduced fishes became established in canals as early as the1950's, when pike killifish (Belonesox belizanus) and oscars (Astronotus ocellatus) became the first introduced species recorded (Belshe, 1961). Additional species were added by both accidental and intentional releases of ornamental species, as well as by intentional efforts to control aquatic weeds or to enhance sport fisheries. In 1984, the Florida Game and Fresh Water Fish Commission (GFC) introduced peacock bass (Cichla ocellaris), native to South America, to control other introduced species and to establish a new game fishery in canals of the southeastern urban area of the state (Shafland, 1995).

The history of introduced fishes in southern Florida is marked by biologists expressing concern for native fish communities, efforts by fisheries biologists to eliminate introductions, and ultimate resignation and acceptance of their presence by State fisheries managers (Courtenay and Robins, 1973; Courtenay et al., 1974; Shafland and Foote, 1979; Shafland, 1986; Fury and Morello, 1994). Though we are unaware of any additional introductions planned for southern Florida, illegal invasions continue to occur routinely (e.g., jaguar guapote Cichlasoma managuense [Shafland, 1996b]). Presently, debate continues over the effects, or lack thereof, of introduced fishes on indigenous aquatic communities in southern Florida.

Much has been written about the potential of introduced fishes to invade and disrupt natural wetland communities such as the Everglades, but few data have been reported to support those claims. Two important contributions to the body of work on introduced fishes in southern Florida have recently appeared that provide opposing perspectives on the ecological significance of the dozen or more species established there. Shafland (1996a) reported that fishes introduced into Florida have had few, if any, demonstrable negative effects on the native ichthyofauna. Further, he suggested that scientific and environmental/aesthetic views are often confused in assessments of fish introductions (Shafland 1996b). Courtenay (1997) provided an alternative perspective, arguing that no effect has been documented because no quantitative data have been gathered. Both authors claim that there are limited ecological data from southern Florida to

resolve these issues. Few could disagree with Shafland that introduction of fishes is a controversial topic, where systematically gathered data and anecdotal information are freely mixed. However, Courtenay's sentiment that lack of observed damage does not equate with no damage is equally important. This discussion mirrors debates in other regions on the wisdom of intentional introductions and feasibility of management to control or extirpate introduced species (Dill and Cordone, 1997).

Several quantitative studies of southern Florida's freshwater and estuarine fish communities were not used by either Courtenay or Shafland in their assessments. The longest running study, begun in 1965 and continuing to present, uses pull traps to sample fishes in northern Shark River Slough in Everglades National Park (ENP; Higer and Kolipinski, 1967); two additional sampling techniques, throw traps and electrofishing, have been used systematically to provide quantitative data (either number of individuals m^{-2} or catch per unit effort [CPUE]) on fishes over time from fixed sampling locations. More recently, similar studies have been completed or are underway in the Arthur R. Marshall-Loxahatchee National Wildlife Refuge (Water Conservation Area 1: WCA-1 [Jordan 1996]), Water Conservation Areas (WCA) 2A, 3A and 3B, throughout the ENP in both Taylor Slough and Shark River Slough, and from coastal habitats along northern Florida Bay (Fig. 1). Each of those studies sought to sample all species systematically, including introduced ones, but were limited by recognized and measurable gear biases. The studies provided data on the relative abundance of introduced and native fishes over time across much of southern Florida. They captured the dynamics of invasions of four species of fishes into southern Florida, and provide insight into other species not abundant enough in the study areas to be sampled routinely. Complete analysis of native fish communities in these data is beyond the scope of a single paper. However, by providing these quantitative data on introduced fishes in southern Florida, we hope to move forward the discourse begun by Shafland and Courtenay.

METHODS

We report data from six studies that used a variety of techniques across many of the inland habitats of southern Florida. Several studies were conducted in more than one habitat: five sampled in freshwater wet prairies, two in canals, one in alligator ponds, and one in mangrove-dominated estuarine marshes. Characteristics of those habitats have been described

elsewhere (Odum et al., 1982; Loftus and Kushlan, 1987; Gunderson and Loftus, 1993). We examined data collected between 1965 and 1998. Two studies are long-term monitoring efforts with periods of record exceeding two decades, long before the first non-indigenous species entered the study areas. We organized the studies by sampling techniques employed.

Throw traps.- A 1-m^{-2} throw trap has been used by many biologists in southern Florida to obtain quantitative estimates of fish density and community composition in vegetated freshwater marshes. Sampling efficiency and biases of this technique have been examined in several studies (Kushlan, 1981; Loftus and Eklund, 1994; Chick et al., 1992; Jordan et al., 1997; Turner and Trexler, 1997). Those studies concluded that the throw trap samples approximately 80% of the fishes present in an area, and is very effective in habitats with vegetative cover from 18 to 680 stems m^{-2}, the entire range examined. No other technique has fared as well in comparative studies (Kushlan, 1981; Chick et al., 1992). Throw traps were used to sample 1-ha gridded plots, where they were thrown in randomly pre-selected locations. We examined several studies of different duration conducted between the years 1985 and 1996. The animals trapped within were removed by a standardized protocol, generally involving bar seines and/or dip nets.

Pull Traps.-Two sample sites established in 1965 have been continually sampled to the present, usually monthly, using a rigid-frame mesh pull trap (Kushlan, 1976, Fig. 1). This technique, in which a net is left on the marsh surface and lifted by a pulley system, has created deepwater microhabitats that attract large fishes (Loftus and Eklund, 1994). In spite of this artefact, the long-term nature of the study permits comparisons of introduced species abundance over a long time scale.

Drop nets.- Red mangrove trees (Rhizophora mangle) with complexes of exposed prop roots preclude use of throw traps in southern Florida's estuarine zone. There, permanently positioned drop nets have been employed from 1990 to 1996 (Lorenz et al., 1997). These nets are dropped to enclose 5-m x 5-m plots that are treated with rotenone to permit fish removal. Unlike throw traps, drop traps re-sample fixed locations over time.

Block nets.- In most Everglades marshes, the density of large fishes is too low to be estimated effectively with the sampling effort feasible with throw traps (Jordan et al. 1997). To address this concern, two methods were employed in south Florida to collect large specimens: block nets and boat electrofishing. The block net is set to encircle a 0.1-ha area that is treated with rotenone (Nielsen and Johnson, 1983). The net is visited daily for two or three consecutive

days to remove as many fishes as possible. Two studies using block nets have been conducted in our area. One contrasted fish communities in canals with those in nearby marshes (GFC, Fury et al., 1995). This study was conducted between 1991 and 1996 and employed a single block net to sample six canal locations and seven marsh locations from WCAs 2 and 3. Fishes in canal block nets were sampled by submerged primacord detonation. The second study was conducted in 1997 in marshes of the ENP, and WCA 2 and 3 (Florida International University [FIU], Chick et al., in press). In that study, duplicate block nets were set in 11 locations and dosed with rotenone.

Electrofishing.- An airboat-mounted Smith-Root type VI electrofisher was used to sample alligator ponds in Shark River Slough from 1983 to 1996. The same six ponds were visited monthly (1983 - 1986) or semi-annually (1996 - 1996) during the study (Nelson and Loftus, 1998). Each pond was sampled for 300 seconds of pedal time, and fishes were returned live to the ponds after processing.

Data presentation.- We chose to forego formal statistical analyses of the data, but instead report the number of specimens of introduced species and the total number of fish examined in each survey. A strength of our study is that it draws together results of many sampling techniques to illustrate community patterns robust to gear biases and habitat differences. This is also a weakness, however, because it limits direct comparability of our data and complicates formal statistical analyses. Instead, we have chosen a narrative comparison of large-scale patterns, attempting to avoid over-interpreting our diverse data. Detailed statistical analyses of each data set will be reported elsewhere.

RESULTS

The sampling studies we reviewed resulted in the capture of more than 100,000 fishes. Relatively few specimens of introduced fishes were collected in freshwater wet prairies, despite extensive sampling efforts there. In contrast, introduced fishes were prevalent in canal and estuarine habitats. In total, three families comprised the majority of specimens of introduced species collected: Cichlidae (5 species), Clariidae (1 species), and Poeciliidae (1 species). Our data documented the population growth and decline of three species, Mayan cichlids (Cichlasoma urophthalmus), pike killifishes, and black acaras (Cichlasoma bimaculatum) in two

locations. A fourth species, spotted tilapia (Tilapia mariae), was observed to invade and increase in abundance at one site but, unlike the previous species, it has not been observed to decline.

Throw traps.- Few specimens of introduced fishes were collected in Everglades wet prairie habitats in the five surveys we examined (Table L.1). Of the 80,000 fishes collected by throw trap, only 239 (0.3% of the total) were not native to south Florida. During the period of record (1985 to 1996), the number of species of introduced fishes was greatest in the southern Everglades (Shark River Slough), where four taxa were collected. The frequency of introduced fishes was also greatest in southern Shark River Slough (Table L.1), where most specimens were collected at one study site adjacent to a natural creek at the marsh-mangrove interface.

Pull traps.- From 300 to 4,500 fish were collected each year by this technique. Between 1965 to 1989, no introduced species were collected. After 1989, 10 to 150 specimens of introduced fishes were collected each year (Figure L.2a). The first introduced species, black acara, appeared in 1989. Biomass of that species never exceeded its original level, and it has remained a minor component of the community to present (Figure L.2b). In 1991, a second species, pike killifish, appeared at high frequency (35% of the biomass) and peaked at around 40% of the biomass in 1993 before returning to much lower levels (Figure L.2b). Like black acara, this species is currently a minor component of the fish community. In 1995, two additional species appeared in the pull-trap samples, Mayan cichlid and spotted tilapia. These increased in relative abundance in the final year of available data, 1996.

Drop traps.- Drop traps sampling estuarine sites along the northern border of Florida Bay yielded from 1,600 to 7,900 fish per year, and included from near zero to 2,200 specimens of non-indigenous species (Figure L.3a). The euryhaline Mayan cichlid was the major constituent of introduced fishes in these samples, so we have focused on their abundance. The number of samples collected varied among years, leading us to standardize the data as the average number of fish per net-sample. The maximum number of fish of all species per sample was collected at the outset of the study in 1990; the number then declined to a minimum in 1993 before rebounding for the remainder of the study (Figure L.3b). The relative abundance of Mayan cichlids displayed a marked "boom-and-bust" pattern over this study period. Mayan cichlids increased from near zero in 1990 to approximately 44% of all fish collected in 1993, before declining to almost zero in 1996 (Figure L.3c).

Block nets.- **GFC**. The total biomass of all fishes in block net samples from canals averaged 579 kg/ha, while those from marshes averaged only 40.5 kg/ha (Table L.2a). These samples differed in the relative biomass of introduced fishes: canal samples averaged 63.5 kg/ha (12.4% of total) of introduced fishes while marsh samples averaged only 1.4 kg/ha (4.2% of total).

FIU. Paired block-net samples collected from marsh habitats in WCA 2 and 3, and ENP indicated that introduced species were more prevalent in the southern Everglades than elsewhere (Table L.2b). We took no introduced fishes from the five sites in the WCAs, while three species were collected from Shark and Taylor sloughs. Few fish of any species were collected in Taylor Slough. The small number of specimens collected in Taylor Slough decreased the chance of detecting introduced species, although several Mayan cichlids were collected at site TS-MD which is adjacent to a small canal.

Electrofishing.- Almost 11,000 specimens were examined during the electrofishing program in northern Shark River Slough alligator ponds (Table L.3). Five species of introduced fishes were collected from 1983 to 1996. Most specimens were captured between 1987 and 1996. The walking catfish (Clarias batrachus) was exceptional in that it was first collected in 1984, but had been collected in the slough earlier by other sampling techniques. Fewer than 1% of all fish collected in these alligator ponds over the study period were non-indigenous.

DISCUSSION

The data we gathered indicate that introduced fishes have not flourished equally in aquatic habitats in southern Florida. We observed marked spatial variation in their prevalence across habitats, which may be a function of the proximity of the sampling area to the site of introduction, or to preferred habitats such as canals. We documented a pattern of early colonization and rapid population growth, followed by decline, and then persistence in three cases. These data serve as a baseline for the Everglades region, against which future changes in introduced fish abundance can be assessed. Nevertheless, descriptive sampling of this sort provides limited ability to establish a cause-and-effect relationship between introduced fishes and changes in the community they invade. Below, we evaluate what can be determined from these descriptive data, and briefly propose future research needed to assess effects of introduced species on community dynamics.

The use of a variety of sampling methods permits us to draw conclusions about native and introduced fish species that inhabit an extensive range of Everglades habitats. Courtenay (1997) argued that limited quantitative information on fish communities in southern Florida hinders assessment of the effects of introduced species. In fact, we demonstrate that data do exist from several habitats in southern Florida. Those data indicate that the relative abundance of introduced species remains low in most habitats, and analysis of community composition also suggests no marked changes to date (Loftus, 1988; Loftus and Eklund, 1994; Trexler et al., 1996). Does this apparent lack of change in the native fish community in wet prairies indicate little or no effect of invaders on community regulation and dynamics? We assert that our sampling programs would have noted extinctions or dramatic ecological shifts in composition or size structure in fish communities, should any have occurred. The low relative abundance of introduced species in wet prairies suggests that introduced species are not present in numbers sufficient to effect regulatory control of community composition or numbers. However, examples of relatively uncommon species acting as keystone species (Ricklefs, 1990) provide a caveat to this conclusion.

In contrast to wetlands, canals offer several features that appear to favor higher population levels of introduced species. Canals provide refuge during droughts and dry seasons when marsh surfaces are exposed. Small fishes moving into canals from marshes during the dry season provide an allochthonous food source to large fishes there (Howard et al., 1995). Both native and introduced fishes inhabiting canals move into adjacent marshes in the wet season (Howard et al., 1995). Large fishes inhabiting Everglades marshes, including introduced species, may be limited by availability of deep-water refuges. In short hydroperiod marshes, populations of large-bodied introduced fishes with multi-year life cycles may be limited by annual dry periods. Because the tropically derived introduced fishes of southern Florida are susceptible to temperature stress in typical winters (Loftus and Kushlan, 1987), they probably find thermal refuge in deep canals. Many south Florida canals penetrate the aquifer where annual minimum temperatures are generally above 17°C (Shafland, 1989, 1995). More quantitative data on fishes in canals and adjacent marsh habitats are needed to better examine the interrelationship of these habitats. The need for deep-water refugia may also explain the higher density of introduced fishes in the southern Everglades in the vicinity of natural streams.

Although the proportion of introduced fishes is greater in Everglades regional canals than in wet prairies, they did not outnumber natives, and never exceeded 20% of the community by biomass. Both Shafland (1989) and Courtenay (1997) stated that introduced fishes dominate canals. Their assessment is probably more accurate for urban canals in southeastern Florida (see Shafland, 1999), especially those that lack connections to wetlands or littoral zone habitats. Native fishes may be more dependent on wetland habitat for feeding and spawning than introduced species, and possibly are at a disadvantage in canals lacking access to wetlands. The estuarine zone of northern Florida Bay provided our only data from a natural ecosystem where introduced fishes reached high densities. In that case, the catch of native species varied inversely with the catch of Mayan cichlids. Although this pattern does not provide proof of a cause-and-effect relationship, further research in this habitat may provide evidence of community-level effects as a result of the Mayan cichlid invasion.

Our data clearly illustrate that introduced species require time to expand across southern Florida from a point of introduction. For example, the Mayan cichlid peaked at our study site in the mangrove zone in 1993, started to become abundant at the pull trap site in northern ENP in 1996, and were first observed in WCA 3A in 1997 (data not reported). It seems likely that this represents a range expansion from an area of introduction to the south (Loftus, 1987). Thus, assessments at any point in time during range expansion may not capture long-term effects of these dynamic new populations. Courtenay (1997) noted that rare introduced species may increase in number at a future date. The pike killifish provides a ready example: it persisted as a small population in several eastern canals for more than 20 years before expanding dramatically in the 1980's and 90's (Courtenay, 1997). A final assessment of introduced fishes in southern Florida and their effects on native aquatic communities, even if restricted to species present today, may not be written for years to come.

We found no evidence of marked ecological effects of introduced fishes on native fish communities in southern Florida, consistent with Shafland's position. This does not negate Courtenay's (1997) position that cryptic or delayed effects have been overlooked. Many ecological effects that are not readily observed are possible, including a variety of interactions among introduced and native species that are negative for natives. For example, several introduced piscivorous species (e.g., peacock bass, pike killifish, walking catfish) have been documented to consume larvae and juveniles of native species. Furthermore, we have observed

competitive interactions among substrate-spawning species (e.g., introduced blue tilapia, spotted tilapia, and Mayan cichlids interacting with native largemouth bass [Micropterus salmoides], warmouth [Lepomis gulosus], and spotted sunfish [L. punctatus] in the ENP). We have also noted nest predation by Mayan cichlids and walking catfish on native centrarchids. The population and community-level effects of these behavioral interactions have not been systematically evaluated and fish community regulation in the Everglades is poorly understood.

In some ecosystems, introduced fishes have caused catastrophic effects on communities in which they have become established. For example, introduction of fishes into North American desert streams has resulted in extinction of some native endemic species (Minckley and Deacon, 1991). Why have the many introductions in southern Florida failed to produce marked effects? The reason no fish extinctions have been recorded from southern Florida introductions may ultimately lie in the composition of our native fauna. Southern Florida lacks endemic specialized species with restricted habitat requirements, the kind of species most susceptible for extinction. This community of generalists may be inherently resilient in the face of natural, and now anthropogenic, disturbances. However, this ability to cope may provide no guarantee for future persistence given the extensive cumulative alterations of the southern Florida ecosystem, including further introductions of fishes. Subtle effects on native invertebrate or aquatic plant communities are quite possible, but simply no one is looking for them. Important local effects resulting from feeding or habitat disturbance may go undetected by studies conducted at an improper scale (e.g., Cowell, 1984). Occasional drought and cold temperatures (Shafland and Pestrak 1982) in Everglades wet prairies may limit the abundance of introduced fishes, which are all of tropical origin, to levels too low to affect native species adversely. Alternatively, intermittent environmental disturbances such as droughts and hurricanes, or gradual ones such as climate change, could open opportunities for invading species to overtake natives and shift the balance of community regulation.

Complete assessments of introduced species, their costs and benefits, are not in the realm of science or the research reported here (Shafland, 1996b). Instead, science provides a method of inquiry and problem solving, not a method to determine societal values of historical and anthropogenically altered fish communities. However, a systematic basis for evaluating ecological effects of post-facto fish introductions in southern Florida and elsewhere is needed, but has not been applied. This must include long-term quantitative sampling of communities

affected and unaffected by introductions across a range of sites. Ideally, samples should be obtained before a new species expands into an area, afterward, and simultaneously in nearby areas lacking the new species (a BACI sampling design [Stewart-Oaten et al., 1986; Underwood, 1994]). Sampling techniques should be sensitive and appropriate to all members of the community, but especially for small-sized and rare taxa susceptible to new predators and competitors. The importance of managing and maintaining native biodiversity must not be overlooked. Data on habitat use and feeding habits of the new species should be obtained and, ideally, experimental studies of direct and indirect effects of the new species should be carried out. The composite of monitoring studies reported here, and others underway, provide an excellent basis for assessing future introductions in southern Florida, especially if coupled with experimental analysis of community regulation.

Acknowledgments

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Table L.1. Frequency of non-indigenous fishes relative to the total number of fishes collected in throw-trap samples from wet prairie habitats in the Everglades.

Location	Species	Frequency & Date
Loxahatchee NWR	black acara	**21** / 33,601 1990-1992
	walking catfish	**2** / 33,601 1990-1992
WCA 3A&B	black acara	**7** / 19,664 1995-1996
	walking catfish	**1** / 19,664 1995-1996
No Shark River Slough	pike killifish	**12** / 26,558 1985-1995
	Mayan cichlid	**74** / 26,558 1985-1995
	spotted tilapia	**1** / 26,558 1985-1995
So Shark River Slough	pike killifish	**17** / 18,728 1993-1996
	Mayan cichlid	**85** / 18,728 1993-1996
	blue tilapia	**1** / 18,728 1993-1996
	spotted tilapia	**11** / 18,728 1993-1996
Taylor Slough	Mayan cichlid	**6** / 4,281 1996
	pike killifish	**1** / 4,281 1996

Table L.2. Block net collections from Everglades marsh and canal habitats. A. GFC results. B. FIU results. Only biomass is reported for GFC samples, while number of specimens collected is reported for FIU samples. We have found a high correlation between biomass and number of specimens in these data. The different measures results from differences in the original data collection techniques. We have opted to report the original data rather than use conversion factors to standardize it.

A. GFC			
Area	Date	All fish kg/ha	Introduced fishes kg/ha (%)
Canals			
L67-A	5/92	1048	202.4 (19.3)
L35-B	4/93	112	13.7 (12.2)
WCA-3	5/94	167	34.2 (20.5)
WCA-3	5/94	672	63.3 (9.4)
L35-B	5/96	979	3.8 (0.4)
L67-A	5/96	501	63.9 (12.8)
Mean canal		579 Å 316	63.5 Å 57.9
Marshes			
WCA-3	10/91	41	3.1 (7.5)
WCA-2A	11/92	51	0.4 (0.7)
WCA-3A	10/92	22	1.2 (5.7)
WCA-3A	10/93	30	0.3 (5.5)
WCA-3A	11/94	53	3.0 (5.5)
WCA-3A	11/95	37	1.6 (4.4)
WCA-3A	10/96	50	0.0 (0)
Mean marsh		40.5 Å 8.7	1.36 Å 0.9
B. FIU			
Area	Total Fish	Introduced %	Species
WCA-2H	48	0	
WCA-2L	128	0	
WCA-3A-4	61	0	
WCA-3A-1	59	0	
WCA-3A-W	12	0	
SRS-6	22	4.5	Mayan cichlid - 1
SRS-8	29	17.2	Mayan cichlid - 5
SRS-37	176	20.5	Mayan cichlid - 30 pike killifish - 1 blue tilapia - 5
TS-MD	23	26.1	Mayan cichlid - 6
TS-TS	9	0	
TS-CP	5	0	

Table L.3. Non-indigenous fishes in pond habitats in the Everglades National Park 1983-1996 collected by electrofishing (Nelson and Loftus 1998).

Species	frequency
black acara	**7** / 10,915
walking catfish	**39** / 10,915
spotted tilapia	**3** / 10,915
Mayan cichlid	**4** / 10,915
pike killifish	**29** / 10,915

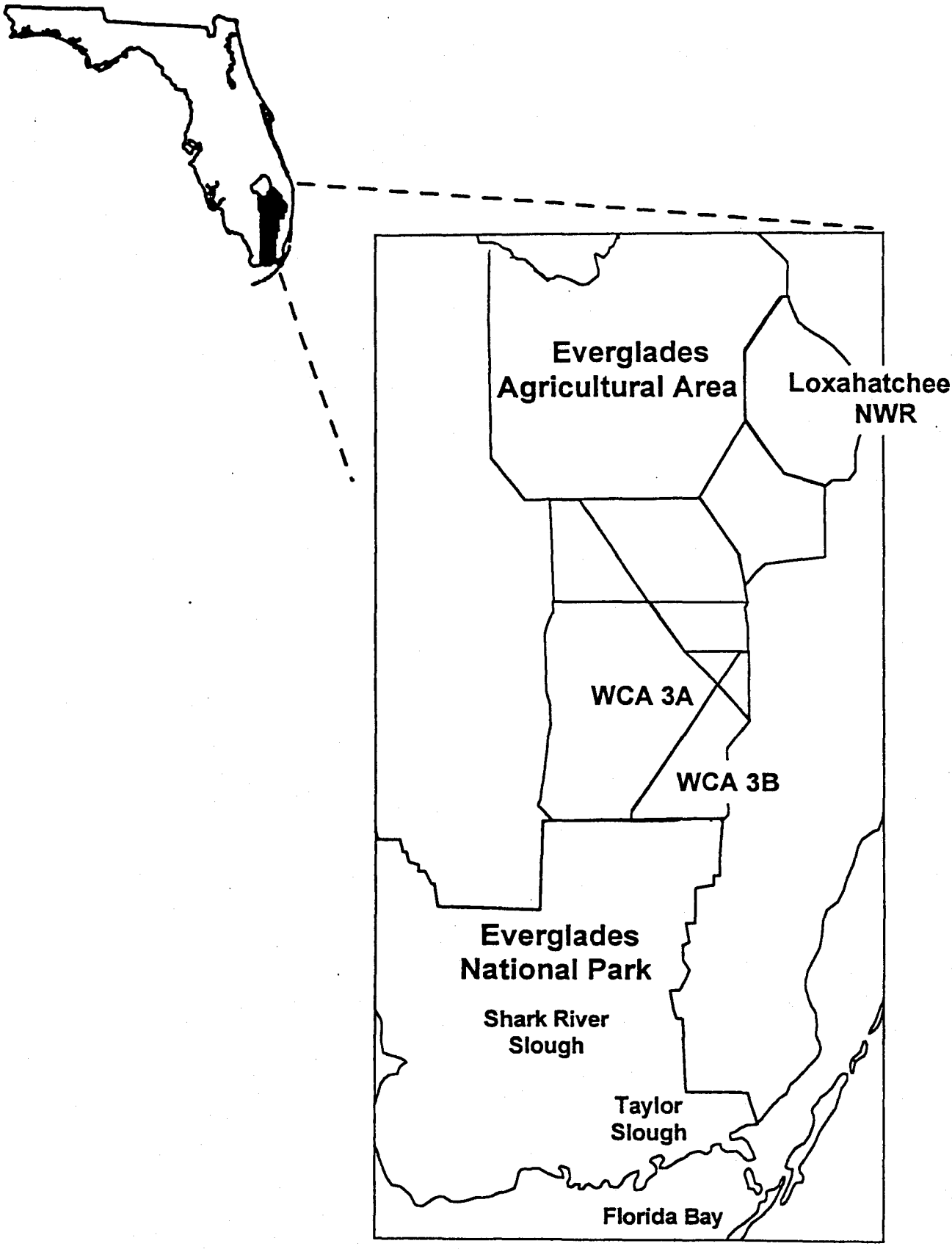
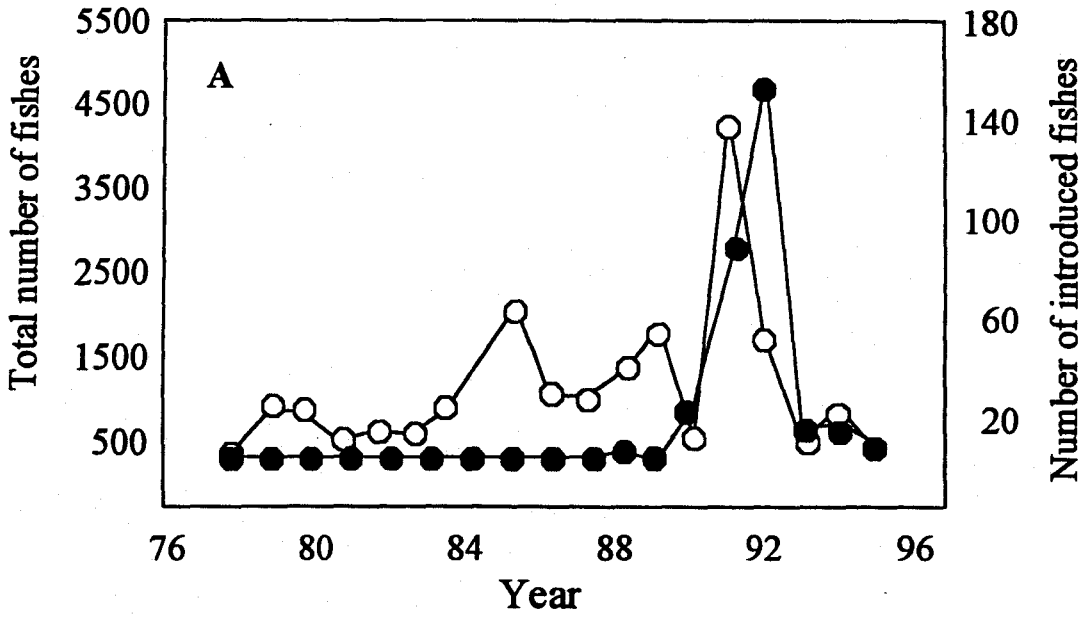


Figure L.1. Map of the study area. Solid lines indicate canals.



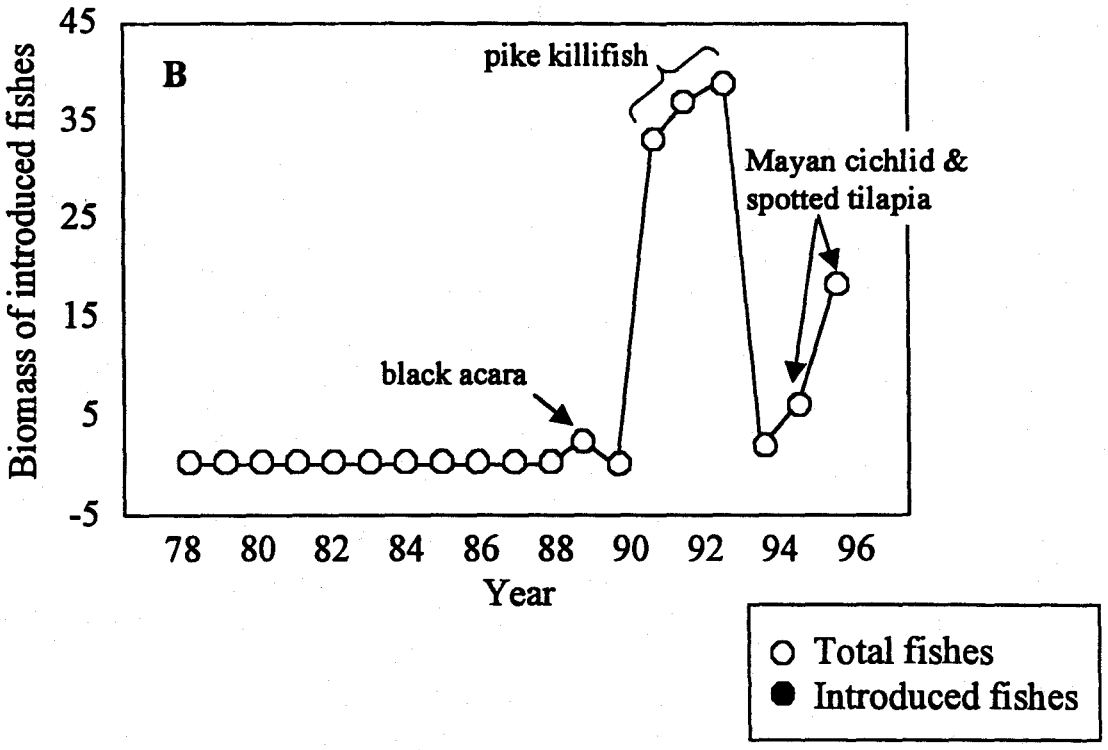


Figure L.2. Freshwater pull trap data from the ENP. A. The total number of all fishes and of introduced fishes collected per year. Samples were collected monthly and summed to yield annual totals. B. The percentage of total fish biomass that came from introduced species. Peaks in 1989, 1991 - 1993, and 1996 are predominately caused by species indicated.

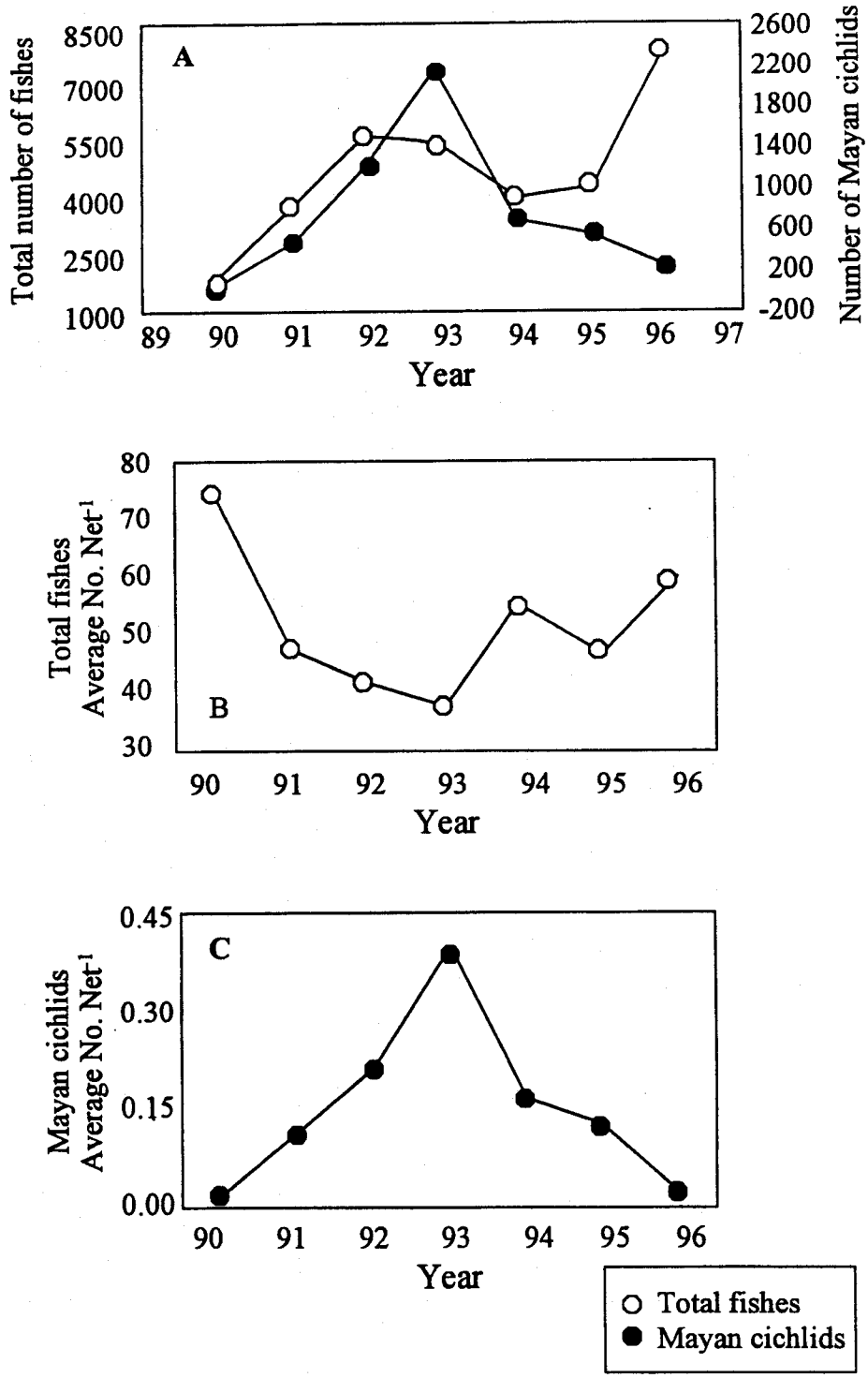


Figure L.3. Number of fishes and Mayan cichlids collected by estuarine pull trap. A. The total number of all fishes and of Mayan cichlids collected by year. B. The average number of fishes of all species per net sample per year. C. The proportion of all fishes that were Mayan cichlids by year.