

BIG CYPRESS NATIONAL PRESERVE

DEER AND HOG ANNUAL REPORT

1991-92

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EXECUTIVE SUMMARY

Prior to the 1990-91 season the National Park Service (NPS) and the Game and Fresh Water Fish Commission (GFC) agreed to several regulation changes on the Big Cypress National Preserve (BCNP) with the proviso that additional changes be held to a minimum for a period of five years. No additional rules or regulations were enacted for the 1991-92 hunting season except for the statewide hunter safety course requirement for persons born after June 1, 1975. During previous years regulatory changes have been implemented on BCNP either to reduce white-tailed deer (*Odocoileus virginianus*) and wild hog (*Sus scrota*) harvest or to reduce recreational pressure on the area.

Hunting pressure during the 1991-92 Big Cypress season (17,083 man-days) increased 19% over 1990-91 (14,340 man-days). Hunting pressure increased on all units of the BCNP over last years levels. Deep Lake was closed until General Gun season with archery only allowed. Pressure on the popular Bear Island Unit increased after 2 years of decline.

Total deer (216) and hog (254) harvest reached the highest levels ever recorded on BCNP. The most striking increase in deer harvest occurred in the Stairsteps and Turner River Units. Deer and hog harvest for General Gun season increased 22% and 23%, respectively over last season. Hunter success (game checked/man-day) was at a record high (0.028).

White-tailed deer morphometric values appear to be similar to values recorded since implementation of the 5-inch antler rule. Mean body weight and antler characteristics were in the upper range of values recorded since the rule (1986-87). Parameters measuring physical characteristics of wild hogs harvested in 1991-92 were similar to last year. Mean body length and

shoulder height of hogs equaled the highest values recorded on BCNP. Higher morphometric and condition values for deer and hogs in recent years could be related to availability of more nutritious food. Increased prescribed burning and favorable hydrological conditions could have played an important role in improving forage quality on the BCNP.

INTRODUCTION

Deer and wild hog are important game animals on Big Cypress National Preserve (BCNP). Deer and hog hunting constitutes a significant component of recreation on the area (Jansen 1986). Deer and hog are also important food items for the Florida panther (Felis concolor coryi) (Belden 1983, Maehr et al. 1990). The purpose of this report is to provide census, harvest and biological information collected on these species during 1991-92 on BCNP.

Hunting

Hunts were held as scheduled with deer and hog hunting permitted during Archery (30 days), Muzzleloader (16 days) and General Gun (47 days) hunts. In addition to statewide rules these hunts were governed by specific regulations for BCNP (Appendix A). Major regulation changes have been enacted since the 1984-85 hunt season and have been summarized in previous reports (see Big Cypress National Preserve Deer and Hog Annual Report 1990-91). Prior to the 1990-91 season the National Park Service and the Game and Fish Commission (GFC) agreed to several regulation changes with the proviso that additional changes be held to a minimum for a period of 5 years. The 1991-92 season fell within the second year of that agreement. No major regulation changes were implemented for the 1991-92 season except for the statewide law requiring persons born on or after June 1, 1975 to successfully complete a GFC-approved hunter safety course prior to taking wild animal life.

This year, the opening date (Nov. 16) of the General Gun hunt on BCNP was one day later than the previous year and three weeks after the opening date (Oct. 26) in the South zone of the statewide framework. The closing date for General Gun season on the BCNP (Jan. 1) was the same as last year and four days earlier than the statewide South zone (Jan. 5). General Gun season on the BCNP was

reduced from 58 to 46 days during 1990-91, but increased to 47 days in 1991-92. Archery (30 days) and Muzzleloader (16 days) seasons remained the same length as 1990-91.

Check station operations were similar to last year, but with increased hours of coverage during Archery season. Provisions were made to operate four check stations approximately 16 hours a day, 7 days a week through Muzzleloader and General Gun seasons. In addition to this coverage, Forty-Mile Bend (FMB) and Bear Island (BI) were operated full time during Archery season, while Dona Drive and Monroe Station were staffed on weekends. An unstaffed check station was also placed at the 31mm of Alligator Alley to accomodate users of Turner River Unit. When check stations were not staffed hunters could check in or out using forms and self deposit boxes at each of the 5 stations. Check station locations are shown on the map in Appendix A.

Environmental Conditions

Primary environmental factors affecting both deer and hog on BCNP are water levels and fire. Both of these factors may have a positive or negative impact on deer and hog populations.

Figure 1 shows general hydrological conditions for BCNP in 1991. This map was generated during semi-annual wading bird surveys flown over the area. Hydrological conditions were classified as wet, transitional or dry. Classifications are determined by the amount of surface water present on the area: wet - 90% or more, transitional - between 5 and 90 percent and dry - less than 5%. Areas with greater than 10% of the area in upland habitat were classified as wet whenever 100% of the wetland areas were inundated. The March 1991 survey showed wetter conditions throughout BCNP compared to March 1990. Deep Lake, Corn Dance and Turner River showed greater amounts of transitional

areas in 1991 than 1990. No portion of Bear Island was considered dry in 1991. The August survey indicated wetter conditions than the previous wet seasons (1989 and 1990) and a return to a more normal wet season hydrological pattern. Virtually the entire preserve was considered wet with a few small areas in the transitional stage.

Fires during 1991 burned 40,552 acres on the BCNP (Table 1). Prescribed fires account for 94% of this acreage, while human caused (accidental or arson) and natural fires accounted for 4% and 2% respectively. Prescribed burn acres decreased after two consecutive years of dramatic increase primarily a result of wetter hydrological conditions on the area. Mixed prairie and pineland habitats were most often burned accounting for 35% and 22% of acres burned, respectively.

CENSUS DATA

Deer population surveys have been conducted since 1984. In the past, pre- and post-hunt surveys have been conducted, although the value of post-hunt surveys has been questioned for a number of years. Beginning in 1987, annual surveys were conducted in May-June of each year in an effort to standardize surveys within BCNP. Original census data are presented in Appendix B.

Bear Island

Deer track counts were conducted on Bear Island from 1977 to 1988 and have been summarized in previous reports (Manor et al. 1991). Because of wide variability in counts, poor condition of transects, and field observations it was concluded that track counts as traditionally conducted were not suitable for the Bear Island Unit. Spotlight counts were conducted in this unit in 1989 to determine the feasibility of this census method and have been continued through 1991 (Table 2).

In 1991 spotlight counts in western Bear Island resulted in population estimates of 736 deer (1 deer per 26 acres) and 563 deer (1 deer per 34 acres). Two estimates were made based on transect length. Transect length varied due to high water conditions. Estimated deer density for eastern Bear Island was 1 deer per 106 acres. Population estimates from 1991 spotlight counts increased dramatically (80%) compared to 1990, once again displaying the high variability involved with the method. Deer harvest (38) in Bear Island during the 1991-92 season was virtually the same as the previous 4 years suggesting that deer populations in Bear Island have not varied as greatly as estimates indicate.

Despite high variability among years, we recommend continued use of spotlight counts as the primary census method in Bear Island due to deteriorating condition of suitable tracking medium along track count transects in this unit. However, this survey technique needs further refinement to yield consistent estimates.

In August 1991 an antler/antlerless aerial survey was conducted in Bear Island and produced an estimated ratio of 1:3.8 (6 antler/23 antlerless) compared to 1:1.9 (8 antler/15 antlerless) in August 1990.

Corn Dance

Deer track counts have been conducted in the Corn Dance (CD) Unit since 1981 (Table 3). Ten permanent transects were established in 1985 (Fig. 2) and are remeasured each year to provide 1 mile of suitable tracking medium. Mean deer tracks per mile of transect have varied between 2.6 in 1985 and 3.9 in 1987 (Figure 3). In 1991, the number of deer tracks observed per mile of transect decreased slightly from the previous year (2.9 and 3.4 respectively). The population estimate for CD in 1991 was 1,253 deer or 1 deer per 227 acres (Table 3). Deer harvest decreased from 28 in 1990-91 to 23 in 1991-92.

Turner River

Deer track count surveys in Turner River Unit have been conducted along a buggy trail in the Mullet Slough area since 1988. Mean number of deer tracks observed per mile of suitable tracking medium was 8.0 in 1991, a decrease from 21.3 tracks/mile in 1990. In 1991 the Mullet Slough portion of Turner River Unit had a population estimate of 145 deer or a density of 1 deer per 221 acres (Table 4). This represents a 58% decrease from the 1990 population estimate of 345 deer or 1 deer per 93 acres. Although Turner River deer population estimates were down, harvest increased from 34 deer in 1990-91 to 50 in 1991-92. Hunter success also increased from the 1990-91 season.

Stairsteps

Deer surveys have been conducted in the Stairsteps Unit since 1978. Some track count surveys were conducted in the western portion of the unit while aerial surveys were the type most frequently conducted in the eastern portion (Table 5). The eastern portion of Stairsteps is largely open Everglades marsh adjacent to Shark Slough. This portion of Stairsteps comprises approximately 50,000 acres. Prior to 1985-86 aerial surveys were flown on north-south transects at 2 mile intervals. In 1985, methodology was changed to conform to standards developed by Everglades National Park for systematic reconnaissance flights (SRF). These standards include east-west transects flown at two kilometer intervals with the survey area divided into 2-kilometer square cells. This technique provides an opportunity to estimate both density and distribution (Fleming 1984). Figure 4 shows the eastern Stairsteps survey area.

The 1991 annual Stairsteps survey yields deer densities ranging from 1 deer per 90 acres to 1 deer per 180 acres. Deer population estimates increased by 20% compared to last year (1 deer: 113-227 acres). Aerial deer counts were slightly

lower than average possibly due to wet spring conditions which may have reduced fawn survival (Figure 5). There was a dramatic increase (58%) in the Stairsteps deer harvest from 55 in 1990-91 to 87 in 1991-92. Airboat access into eastern Stairsteps was greatly enhanced by favorable water levels during 1991-92 as compared to the 1990-91 season.

An aerial survey in eastern Stairsteps during May 1990 was used to estimate a deer recruitment rate of 31% (18 fawns : 40 adults). This type of survey has not been conducted for years on the Big Cypress, and was not conducted in 1991. An aerial census in spring 1991 yielded a density of 1 deer:111 acres for Stairsteps (Labisky et al. 1991).

HUNTING

During all big game seasons only antlered deer were legal game. Since the 1986-87 season the minimum antler length has been 5 inches. Wild hogs with a minimum shoulder height of 15 inches were also legal game. Hunting pressure on BCNP was estimated at 17,083 man-days for Archery, Muzzleloading and General Gun seasons (Table 6). This estimate of pressure was 19% above the estimate of 14,340 man-days recorded last year. Deer harvest (216) was a new record eclipsing the record of 208 in 1987-88. Hog harvest was 41% higher than the prior year (254 vs. 180) and reached the highest level since records were kept.

Hunter success (game checked/man-day) was at a record high (0.028) and represented a slight increase from the 1990-91 success rate of 0.025 (Table 6). Hunter success rate has remained fairly stable (0.015-0.016) except for the 1987-88 season (0.020) and the last 2 years which displayed record rates of success. The mandatory check of hunters has not directly impacted these calculations since that information was not utilized in estimating man-days of hunting. Hunting

pressure was calculated by comparing Saturday vehicle counts with base year surveys. An indirect but potentially significant impact of mandatory check-out is increased compliance with rules requiring that deer and hogs be checked.

Hunter activity and checked harvest has been documented for the last twelve years (Figure 6). Hunter pressure appears cyclical with rising pressure from 1980-1984 followed by a dramatic decrease in 1985. Pressure increased through 1988-89 and was followed by a precipitous decline in 1990-91 then an increase in 1991-92. Dramatic changes in hunter pressure are due in part to major regulatory changes on BCNP. Deer harvest has fluctuated, but has remained fairly stable since the 1987-88 season with a record harvest being reached this year. Hog harvest has been gradually increasing over the past 5 years and reached a record level this year. Historically, declines in harvest of one species have often been offset by increases in harvest for the other species.

Deer and hog harvest by season compared to the previous 2-year averages are shown in Table 7. The 1991-92 Archery season deer harvest approximated trends over the past 2 years, however hog harvest was 50% greater. During Muzzleloading and General Gun season both deer and hog harvest exceeded the prior 2-year average. Hunter success ratios for every season equalled or exceeded prior 2-year averages. This increase in hunter success followed an increase in hunter pressure combined with record checked harvest levels of deer and hogs.

Harvest and hunter pressure are compared by unit and season in Table 8. Generally, trends for individual units follow overall trends already discussed. The most pronounced increases in deer harvest occurred in the Stairsteps and Turner River Units. Stairsteps deer harvest (87) was still 27% below the record harvest of 118 during the 1987-88 season. All other units on BCNP experienced a decline in number of deer harvested. No deer were harvested from Deep Lake

Unit. Hog harvest was greater on Corn Dance, Turner River, and Loop Units by 2.0, 2.4, and 3.4 times, respectively, over 1990-91 levels. Bear Island hog harvest returned to its 1989-90 level. No hogs were taken in Deep Lake Unit. Deep Lake Unit was closed during Archery and Muzzleloading and was restricted to archery only hunting during General Gun season with vehicle use prohibited.

Overall, hunting pressure increased on all BCNP Units. The most pronounced increases in pressure occurred on Turner River and Stairsteps, 15% and 60% respectively. Pressure increased on the popular Bear Island Unit after 2 years of decreasing use, despite restricted access to Turner River Road from Alligator Alley. In general, length of the hunting season and the large land area have created low hunter densities on BCNP. Normally there are between 50 - 500 hunters daily on the entire BCNP, resulting in a hunter density of 450 - 4,600 ha per hunter (Schortemeyer et al. 1991).

Archery Season

Archery season was open September 7 through October 6. This was the second year of the 30 day season length. During Archery deer (10), hog (24) and total harvest were greater than the prior 2-year average (Table 9). Total harvest of 34 animals was 42% greater than the prior 2-year average. Hunting pressure (1845 man-days) was slightly greater (2%) than the prior 2-year average.

Muzzleloading Season

For the seventh year Muzzleloading season was 16 days long (October 12 through October 27). Muzzleloading season deer harvest (37) was the same as last year but was 21% greater than the prior 2-year average while hog harvest (65) was dramatically greater at 2.1 times the prior 2-year average (Table 10). Seventy-

five percent of the harvest occurred within the first 9 days of the season. Hunting pressure increased by 12% when compared to the prior 2-year average.

General Gun Season

The 1991-92 General Gun season was 47 days (November 16 through January 1). Hunter activity and harvest during the General Gun season are summarized in Table 11. Hunter activity was estimated at 13,208 man-days, a slight decrease (12%) from the prior 2-year average. Deer harvest (169) was up 15% from the prior 2-year average while hog harvest (165) was up 33%.

Between 1980 and 1982 several different methodologies were utilized to estimate hunter pressure. Efforts to measure use were intensified in 1983 and 1984. During these years a consistent effort was made to improve estimates of hunter use by combining check station information, vehicle surveys and other information (Jansen, 1986). Hunter use in 1991 was calculated by multiplying the 1984 hunter activity (base year) estimate by the ratio of the 1991 vehicle survey to the 1984 vehicle survey (base year). Results of vehicle surveys are summarized in Appendix C. While vehicle surveys do not directly measure hunter pressure they do provide a good index and therefore the trends over the past 8 years can be analyzed.

Hunting pressure by week of General Gun season over the past 8 years is shown in Figure 7. In general, use is highest during the first 9 days followed by Thanksgiving week. Use levels decline after that until the end of the season. Use levels at the end of the season increase, but generally remain below levels in the first 2 weeks. Levels presented for the first week are actually for the first 2 days only (opening weekend). Remaining weeks cover a full 7-day period, except for 1990-91 and 1991-92 in which week eight is only 2 and 3 days long

respectively. Although the eighth week of the 1991-92 had 1 extra day, pressure was lower than the 1990-91 level.

In general, 1991-92 weekly hunting pressures on BCNP were greater than last year and this was particularly true for opening weekend, Thanksgiving holiday (week 3, 1991) and Christmas Holiday (Week 7) (Figure 7). Perhaps stable hunting area use regulations, as well as favorable hydrological conditions increased hunting pressure in 1991-92 compared to last season.

Use estimates derived from mandatory check-in and check-out will be presented in a separate report. However, preliminary results from 1991-92 indicate that estimates of hunter pressure based on vehicle surveys are comparable to direct measurements from mandatory hunter check-in/out forms. Three methods are utilized in calculating hunter pressure from mandatory check-in and check-out cards: Calendar Days, Calendar Days with Daylight, and Man-days. Each day is counted as a "Calendar Day" of hunting pressure beginning with the day a hunter checked-in through the eventual date of departure from the management area (checked-out). This would be the most liberal estimate of hunting pressure since obvious non-hunting opportunities (such as late Friday night check-ins) would be counted. "Calendar Day Of Daylight" estimates attempt to address this deficiency and are similar to the Calendar Day computation except that a hunter checking-in with less than 2 hours of hunting daylight (1.5 hours before sunset) or hunting excursions of less than 1 hour will not be credited as hunting for that particular day. It is assumed that the hunter is setting up camp or in the latter case will not have enough time to hunt due to travel time. "Man-day" estimates from hunter check-in/out cards credit a hunter with a man-day of hunting pressure depending on how many hours elapsed between check-in and check-out. If over 50% of the hunttable daylight hours were spent in the field

then the hunter receives a whole man-day of pressure, otherwise a half man-day. This is the most conservative estimate of pressure and more closely resembles actual hunting activity. None of these methods evaluate noncompliance with the mandatory check-in rule. In 1991-92, the estimate of total hunter pressure (Archery through General Gun) based on vehicle count surveys (17,083 man-days) was greater than the Man-day estimate from check-in cards (15,662 man-days), similar to Calendar Day with Daylight (17,593 man-days) but lower than Calendar Day (19,029 man-days) estimates. During General Gun season total vehicle count estimates (13,208 man-days) were greater than the other 3 estimates compiled from the hunter check-in forms (10,755 - 12,789 man-days). Hunter pressure calculated from vehicle counts tended to be less than direct measurements from check-in cards for Archery and Muzzleloading seasons but greater than General Gun estimates. Overall, Saturday vehicle counts were reasonable estimates of hunter pressure when compared to estimates from mandatory check-in and check-out.

WHITE-TAILED DEER BIOLOGICAL DATA

Herd Composition

Sex ratios were determined from 357 and 370 spotlight observations made in Corn Dance and Bear Island Units, respectively (1984-90). Sex ratios of adult deer in Corn Dance and Bear Island Units are 1:3.6 and 1:2.3 (buck:doe), respectively.

Harvested deer were aged by tooth wear and eruption (Severinghaus 1949). In 1991-92 harvest increased for the 1.5 year age class but no deer were

harvested in the fawn age class. The 1.5 year age class constituted 27.3% of the harvest, while the 2.5 year age class accounted for 37.0% (Table 12). Percentage of harvested deer greater than 3.5 years old (35.7%) decreased from last year (37.4%) which was the highest percentage ever recorded on BCNP. Harvest in the 4.5 (6.7%) and 5.5+ (4.2%) age classes declined compared to last year (10.2%, 8.2% respectively). Initial response (1986) to the 5-inch minimum antler requirement was a reduction in the total number of bucks harvested and elimination of the fawn age class from the checked harvest. In subsequent years (1987-1990), older bucks have increased in the harvest while yearlings (1.5 year-olds) have been substantially reduced. As predicted under the 5-inch minimum antler regulation, age structure has shifted to older age classes for harvested bucks on BCNP.

Deer age structure by unit of harvest is shown in Table 12. Bear Island Unit had the highest portion (61%) in the 1.5 year age class. Stairsteps Unit had the highest percentage of deer (49%) in the 2.5 year age class, while Corn Dance and Loop Units had the highest portion (56% and 62% respectively) in age classes greater than 2.5. Overall, age structure data indicated moderate recruitment in recent years. Field observations, surveys, documented harvest, and information from radio-collared deer (see reproductive status) have indicated fluctuating recruitment rates over the past 4 years.

Physical Characteristics

Antler characteristics and dressed weight by age class and unit of harvest are shown in Table 13. Overall, values in 1991-92 are similar to those reported since implementation of the 5-inch antler rule (1986-87). Average dressed weight of all animals ranged from 73 pounds in 1989 to 67 pounds in 1986 and was measured at 72 pounds in 1991. Antler circumference at 6.7 cm in 1991 was

greater than earlier years (5.6-6.4 cm). In 1991, antler length (21.3 cm) fell within the range set in previous years (18.8-23.3 cm). Average number of points per deer (5.1) exceeded last years high of 4.8. Higher values for dressed weights, antler measurements and number of points in recent years are primarily a function of an increase in age structure of harvested bucks. However, some of this improvement could be related to better forage quality with increased prescribed burning and favorable hydrological conditions playing an important role.

Occurrence of spikes by age class and unit of harvest is shown in Table 14. In 1991-92 overall percent spikes by age class was greater in the 1.5 year class (67% vs. 52%) and 3.5 year class (15% vs. 4%) than 1990-91. Thirty-three harvested deer were spikes in 1991 which was greater than 1990 (29), but the percentage of spikes in the total harvest (31%) was identical for both years.

From 1986-90 172 deer were collected from Bear Island (BI, n=36) and Corn Dance (CD, n=27) Units of BCNP, the Fakahatchee Strand State Preserve (FS, n=38), Collier Enterprise lands (CE, n=34), and the Florida Panther National Wildlife Refuge (PR, n=37) and analyzed for morphometric parameters. Adult does (n=129) were analyzed for physical condition from this sample.

Overall, adult does in FS and CD had lower Kidney Fat Indices, tail fat and physical condition values than deer in BI, PR and CE (Table 15). Mean APC values for Bear Island deer (726) were lower than CD (1270) (Table 16). Deer in good physical condition commonly have lower APC values than deer in poor condition.

Within BCNP, physical condition of BI deer is better than that of CD. As previously noted (Schortemeyer et al. 1991, McCown 1988) the better habitat of BI is primarily responsible for this observation. In general, deer herd densities in CD are low, while APC values are comparatively high. Much of CD

consists of expansive prairies of dwarf cypress (Taxodium distichum) growing over bare mineral soil with a scattering of pine islands and few hardwood hammocks. Palatable forage in CD is spatially and temporally isolated resulting in deer concentrating around forage producing areas. This facilitates transmission of parasites and the lack of nutritious forage lowers deer condition values. In contrast, BI supports a denser deer herd which is in better physical condition than CD. A mosaic of habitat types including freshwater marshes, sloughs, prairies, strands, cypress, pine and hammock forests along with more fertile soil conditions are primarily responsible for better physical condition of BI deer.

Reproductive Status

Reproductive status of deer was determined by necropsy and by observations of radio-instrumented does. Net productivity of does did not differ among areas and appears capable of maintaining population stability (Table 17).

Nine of 16 radio-instrumented does in BI were observed with fawns of the year during spring 1991 for a 56.2% fawning success rate. This rate is comparable to the 1988 rate (50%), both of which were less than fawning success in 1990 (83%) and 1989 (80%). Low fawning success for spring 1991 may have been a result of higher water levels.

Fawn Mortality Rates

Data from collected does in Bear Island show that 93.1% of does should be pregnant with an average of 1.2 fetuses/doe (McCown 1991). By applying these values to 1991's observations of fawning success, it is possible to estimate neonate fawn mortality. Of 17 does with known fawning success, 15.8 should have been pregnant ($17 \times .931$) and produced 19.0 fetuses ($15.8 \text{ does} \times 1.2$

fetuses/doe). This suggests a spring 1991 neonate fawn mortality of 47.0% [1- (10 observed fawns/19.0 estimated # of full-term fetuses)].

This neonate fawn mortality rate is comparable to 1988's 55.2% and much greater than 1989's and 1990's rates of 28.4% and 20.4% respectively. These fluctuations in neonate fawn mortality may be related to water level during the spring fawning season. The 1988 and 1989 rainy seasons (June to November) produced below normal rainfall totals leaving drought conditions in southwest Florida, which were particularly acute during the normally dry springs. Low water conditions may have allowed does to disperse, instead of concentrating on higher ground, for selecting birth sites and hiding cover for neonates. This may have reduced the chances of fawn predation. The 4-year average neonate fawn mortality rate was $37.8\% \pm 16.1$ SD.

Thirteen fawns were captured in BI and instrumented with radio-collars. This fawn sample enabled us to estimate the survival pattern for the 6 month period prior to their first birthday. Of the 13 animals that began the 6 month to 1 year age interval, 12 survived. The only mortality was the result of bobcat predation. These data suggest that fawns in BI have a 92.1% chance of surviving to their first birthday once they are at least 6 months of age. In contrast, annual survival rate of fawns in Stairsteps Unit was low (0.2188, n=8) in 1989-90 but increased to 0.4375 (n=16) in 1990-91 (Labisky et al. 1991). Fawn survival was less in the nonhunted Everglades National Park (ENP) herd (1989-90, 0.0695, n=8; 1990-91, 0.1172, n=14) (Labisky et al. 1991).

Adult Mortality Agents and Survival Rates

Twenty-seven radio-instrumented or ear-tagged deer have died since the beginning of the BI study (Sept. 1986). Bobcats (Felis rufus) are the most

important predators on white-tailed deer in Bear Island, preying upon at least 8 and perhaps as many as 11 deer. Florida panthers have preyed upon 4 radio-collared deer. Humans have taken 3 deer legally, 2 were ear-tagged bucks and the third was a doe harvested off the Preserve during the antlerless season. Two other does were illegally killed during general gun season 1988. Four does died of natural (non-predator) causes; one suffered a broken leg, another suffered a broken jaw, and the third died of an unknown infectious agent and related pneumonia. The fourth deer died after twin fetuses became lodged in the birth canal and could not be expelled (D. Forrester, pers. comm.). This doe, dead for < 24hrs, was subsequently scavenged by a bobcat. The last 2 deer died of unknown causes. Labisky et al. (1991) found similar results in the Stairsteps/Everglades deer herd where bobcat predation was the leading cause of mortality for collared deer (33 deer or 43% of all recorded deaths).

Calculations of survival rates for BI deer followed Trent and Rongstad (1974) and Heisey and Fuller (1985). The year was divided into 3 intervals, summer (June to onset of hunting season), hunting season (November and December) and spring (January through May). The hunting season corresponded with general gun season. Archery and muzzleloader seasons, 38 days in Sept.-Oct., were not included in the hunting interval because hunting pressure is 5 times less and documented harvest is 7 times lower than in general gun (Schortemeyer et al. 1989) and thus the impact on the deer herd was assumed negligible in comparison to general gun. Survival rates for deer during each interval were calculated by the formula:

$$S_i = [(X_i - Y_i)/X_i]^n$$

where S_i is the interval survival rate, X_i is the number of radio-transmitter days, Y_i is the number of animals dying during the interval, and n is the length of the interval in days (Table 18).

White-tailed does in BI, regardless of age, had an average survival rate of 0.813 (95% CI = 0.68, 0.94), meaning that 81% of all collared deer would survive any given year. There were no differences in survival rates between the three seasons (summer, hunting, and spring) either within a particular year or across all years. Annual survival rate of adult females in Stairsteps (1989-90, 0.808, $n=15$; 1990-91, 0.8789, $n=18$) was comparable to BI and was substantially higher than the nonhunted herd in ENP (1989-90, 0.453, $n=14$; 1990-91, 0.7571, $n=17$) (Labisky et al. 1991).

Home Range Size

Adult doe 95% convex polygon home ranges varied from 28-214 ha in size and were not related to sample size ($R^2 = 0.03$, $P = 0.336$). Average home range size was 194 ha. Bear Island doe home ranges were within the range reported for adult does in upland habitats in Florida: 85 ha (Marchinton and Jeter 1967), 270 ha (Bridges 1968), 331 (Labisky et al. 1991), 342 ha (Smith 1970). White-tailed buck home ranges were 472 and 1049 ha based on data from 2 adults.

Adult doe activity centers (defined as the mean east-west and north-south Universal Transverse Mercator coordinate) showed significant shifts between hunting and non-hunting seasons ($Z = 5.5$, $P < 0.01$). However, 95% of these activity centers were less than 600m apart between hunting season and the rest of the year and the average shift was 300m. In no case did these shifts reflect the formation of a separate, disjunct use area. No radio-instrumented deer vacated the Big Cypress Preserve Wildlife Management Area during the

hunting season. Four does had ranges along the Big Cypress borders and freely moved into and out of the preserve throughout the year.

The shift of activity centers was probably the result of significant changes between summer and fall habitat use ($\chi^2 = 193.4$, $df=6$, $P<0.0001$). Two upland habitat types, hardwood hammocks and pine flatwoods, were used more ($\chi^2 = 43.3$ and 18.8 , respectively; $df=6$, $P< 0.00714$) and freshwater marshes less ($\chi^2 = 98.0$) than expected in fall when compared to summer habitat use.

This change in habitat use could be explained by deer taking advantage of mast production and/or deer seeking hiding cover. Mast-producers like live oaks (Quercus virginianus), laurel oaks (Quercus laurifolia), gallberry (Ilex glabra), and saw palmetto (Serenoa repens) are utilized by white-tailed deer (Halls 1977) and come into fruit during the fall (pers. obs.). Besides mast production, hardwood hammocks and pine flatwoods have more structural diversity than marshes so their utility as hiding cover may be greater. Other studies have shown that deer will move to areas of denser hiding cover at the onset of hunting season activities (Pilcher and Wampler 1981, Kufeld et al. 1988). However, no emigration of Bear Island deer occurred during the hunting season so even if hiding cover was sought, their existing use areas provided adequate refugia.

WILD HOG BIOLOGICAL DATA

Whenever possible, biological data was collected from harvested hogs when they were examined at the check station. Parameters normally measured included weight, body length, tail length and shoulder height. Measurements were taken on approximately 998 of the 1530 hogs checked over the past 9 years.

Average gutted weights, lengths, and shoulder heights for hogs harvested during the last 9 years are shown in Table 19. Average weight, length and shoulder height were all similar to the previous year. Mean body length and shoulder height measurements equaled the highest values previously recorded on BCNP. Average dressed weight was nearly identical to last year, 78 and 77 lbs., respectively and only 6% less than the record high of 83 lbs. recorded in 1988-89. Availability of more nutritious food or perhaps a preponderance of older animals in recent hog harvests could explain these increases in hog measurements since the 1989-90 season. Good mast production, increased prescribed burning and favorable water conditions also may have contributed to improved forage quality and quantity.

Measured physical characteristics of male hogs harvested were greater than those of females in 1991-92 (Table 20). Males outweighed females by 35% or 23 pounds (88 pounds vs. 65 pounds). Average body length of males was 9% greater than females (124 cm vs. 114 cm) while shoulder height was 8% greater (66 cm vs 61 cm). These differences are similar to those observed over the prior 8 years.

In general, Bear Island appears to be better habitat for wild hogs compared to Stairsteps Unit (Table 21). In the 1991-92 harvest, hogs in Bear Island weighed 5 pounds more than hogs taken from Stairsteps (Avg. Dressed Weight). However, in 1991-92 average body length was slightly less (1 cm) in Bear Island as compared to Stairsteps while average shoulder height was greater in Bear Island (67 cm vs. 65 cm). Average dressed weight, antler beam length and number of points for male deer are greater in Bear Island than in Stairsteps Unit (Table 13). In previous years differences between the 2 areas

have been greater and would indicate that both spatial and temporal habitat differences tend to affect deer and hog similarly.

Occurrence of fresh hog sign on Corn Dance Unit deer transects declined from 33% in 1990 to 28% in 1991 (Figure 8). This is the second straight year of decline following the peak occurrence of 50% in 1989. However, hog harvest has steadily increased on Corn Dance Unit from 5 animals in 1989-90 to 25 in 1991-92 despite a 21% decrease in hunting pressure. Prior to 1987 occurrence of fresh hog sign on white-tailed deer track count transects was so rare records were not kept. Increases in the checked hog harvest in the Corn Dance Unit are probably a combination of increased populations and greater compliance with the game check regulation.

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Table 1. Number of acres burned in Big Cypress National Preserve, 1979-1991.

Year	Total Acres	Human Caused	Prescribed	Natural
1979	24,147	21,482	2,642	23
1980	27,717	20,052	7,440	225
1981	217,378	215,037	1,683	658
1982	49,218	44,691	4,527	0
1983	11,474	1,297	9,950	227
1984	23,064	4,013	17,713	1,338
1985	16,595	2,510	8,729	5,356
1986	51,443	32,718	18,355	370
1987	27,998	3,775	21,767	2,456
1988	40,866	23,751	17,031	84
1989	58,080	17,051	40,386	643
1990	73,058	9,913	62,950	645
1991	40,552	1,631	37,993	928
TOTALS	661,590	397,921	251,166	12,953
AVG./YR.	50,892	30,609	19,320	996

(Unpublished data from BCNP, March 1992)

Table 2. Population estimates based on spotlight counts for white-tailed deer on Bear Island Unit, BCNP, 1989-1991.

Time of Survey	Source	Unit	Number of Surveys	Deer Count High/Average	Calculated Size of Survey Area (acres)	Population Estimate	Density (deer/acre)
1991 Annual	Schortemeyer, Wanor & Bozzo July 1991	Western Bear Island	3	16/7.7	19,129	736 563	(1:26) (a) (1:34) (b)
1991 Annual	Schortemeyer, Wanor & Bozzo July 1991	Eastern Bear Island	3	11/5.7	19,129	180	(1:106)
1990 Annual	Schortemeyer & Wanor June 1990	Western Bear Island	5	4/2.4	19,129	140	1:137
1990 Annual	Schortemeyer & Wanor June 1990	Eastern Bear Island	4	2/1.3	19,129	33	1:584
1989 Annual	McGrady, Wanor & Schortemeyer May 1989	Western Bear Island	3	24/11.3	19,129	683	1:28
1989 Annual	McGrady, Wanor & Schortemeyer June 1989	Eastern Bear Island	2	11/7	19,129	266	1:72

(a) 3.1 mile transect

(b) 5.0 mile transect

Table 3. Population estimates for white-tailed deer in the Corn Dance Unit of the BCNP, 1980-91.

Time of Survey	Method	Source	Calculated size of unit (acres)	Population Estimate	Density (deer:acre)
1991 Annual	Track Counts	McCown 1991	283,791	1253	1:227
1990 Annual	Track Counts	McCown 1990	283,791	1500	1:189
1989 Annual	Track Counts	McCown 1989	283,791	1215	1:234
1988 Annual	Track Counts	McCown 1988	283,791	1412	1:201
1987 Annual	Track Counts	McCown 1987	283,791	1720	1:165
1986 Annual	Track Counts	McCown 1986	283,791	1260	1:225
1985-86 Pre-hunt	Aerial Counts	Schorfemeyer 1985	283,791	280-385	1:1013-737
1985 Annual	Track Counts	McCown 1985	283,791	1140	1:249
1984-85 Pre-hunt					
1983-84 Post hunt					
1983-84 Pre hunt					
1982-83 Post hunt	Track Counts	Pyliant, memo, 11 April 1983	270,000	1268-2250	1:213-120
1981-82 Post hunt	Track Counts	Pyliant, memo, 21 April 1982	270,000	1080-1875	1:250-144
1980-81 Post hunt	Track Counts	Pyliant, memo, 28 Dec. 1981	300,000	1620	1:185

Table 4. Population estimates for white-tailed deer in the Turner River unit (Mullet Slough) of the BNCP, 1988-1991.

Time of Survey	Method	Source	Calculated Size of Survey Area (acres)	Population Estimate	Density (deer:acre)
1991 Annual	Track Counts	Schortemeyer, Manor & Bozzo May 1991 (c)	32,000	145	1:221
1990 Annual	Track Counts	Schortemeyer & Manor May 1990 (b)	32,000	345	1:93
1989 Annual	Track Counts	McGrady & Manor May 1989 (b)	32,000	300	1:107
1988 Annual	Track Counts	McGrady April 1988 (a)	32,000	58	1:549

- a) Track counts conducted off Cypress Lane, two replications.
b) Track counts conducted off Cypress Lane, three replications.
c) Track counts conducted off Cypress Lane, three replications.

Table 5. Population estimates for white-tailed deer in the Stairsteps unit (eastern portion) of the BCNP, 1977-91.

Time of Survey	Method	Source	Calculated size of unit (acres)	Population Estimate	Density (deer/acre)
1991 Annual June (1 of 2)	SRF Aerial Counts	Manor and Bozzo	50,000	280-560	1:180-90
1991 Annual June (2 of 2)	SRF Aerial Counts	Manor and Bozzo	50,000	280-560	1:180-90
1990 Annual	SRF Aerial Counts	Schortemeier and Manor	50,000	200-442	1:227-113
1989 Annual	SRF Aerial Counts	Schortemeier and McGrady	50,000	602-1220	1:83-41
1988 Annual	SRF Aerial Counts	Schortemeier and McGrady	50,000	485-980	1:103-51
1987 Annual (1 of 2)	SRF Aerial Counts	Schortemeier and Ramsey	50,000	38-76	1:1322-661
1987 Annual (2 of 2)	SRF Aerial Counts	Schortemeier and Ramsey	50,000	19-38	1:2643-1322
1986-87 Post-hunt	SRF Aerial Counts	Schortemeier and Ramsey	50,000	250-500	1:200-100
1986-87 Pre-hunt (2 of 2)	SRF Aerial Counts	Schortemeier and Ramsey	50,000	330-660	1:152-76
1986-87 Post-hunt (1 of 2)	SRF Aerial Counts	Schortemeier and Ramsey	50,000	220-560	1:180-90
1985-86 Post-hunt	SRF Aerial Counts	Schortemeier and Ramsey	50,000	240-480	1:210-105

Table 5. continued

Time of Survey	Method	Source	Calculated size of unit (acres)	Population Estimate	Density (deer:acre)
1985-86 Pre-hunt	SRF Aerial Counts	Schortemeyer and Ramsey	50,000	410-820	1:120-60
1984-85 Post-hunt					
1984-85 Pre-hunt	Aerial Counts	Schortemeyer 1984	50,000	316-633	1:158-79
1984 Post Production (2 of 2)	Aerial Counts	Schortemeyer 1984	50,000	117-220	1:427-227
1984 Post Production (1 of 2)	Aerial Counts	Schortemeyer 1984	50,000	70-132	1:714-379
1982-83 Post-hunt	Aerial Counts	Pylant, memo, 11 April 1983	50,000	379-543	1:132-92
1982-83 Pre-hunt	Aerial Counts	Pylant, memo, 30 Sept. 1982	50,000	833-1190	1:60-42
1981-82 Post-hunt	Track Counts	Pylant, memo, 21 April 1982	50,000	171	1:135
1980-81 Post-hunt	Track Counts	Pylant, memo, 28 Dec. 1981	141,800	1013	1:140
1979-80 Post-hunt	Track Counts	Pylant, memo, 28 Dec. 1981	140,300	954	1:147
1978-79 Post-hunt	Track Counts	Pylant, memo, 28 Dec. 1981	140,000	954	1:147
1977-78 Post-hunt	Track Counts	Pylant, memo, 28 Dec. 1981	141,000	1102	1:128
1977-78 Post-hunt	Track Counts	Bowman, memo, 9 June 1978	140,600	743	1:190

Table 6. Big Cypress National Preserve deer harvest, hog harvest and hunting pressure, 1980-92.

Year	No. of Man-days	No. of deer Harvested	No. of hogs Harvested	Hunter Success (a)
1980-81	14,240	103	81	0.013
1981-82	16,539	104	44	0.009
1982-83	18,625	145	141	0.015
1983-84	23,015	140	201	0.015
1984-85	24,360	205	195	0.016
1985-86	17,195	156	111	0.016
1986-87	17,290	127	153	0.016
1987-88	17,525	208	138	0.020
1988-89	21,567	185	144	0.015
1989-90	21,660	186	154	0.016
1990-91	14,340	182	180	0.025
1991-92	17,083	216	254	0.028

(a) Hunter Success = (deer and hog harvest)/man-days of hunting.

Table 7. Big Cypress National Preserve deer and hog harvest, and hunter success ratio by season.

DEER				
SEASON	No. Harvested		Hunter Succ. Ratio (a)	
	1991-92	Prior 2 yr. avg.	1991-92	Prior 2 yr. avg.
Archery	10	8.0	0.005	0.005
Muzzleloader	37	30.5	0.018	0.017
General Gun	169	147.0	0.013	0.010
HOG				
Archery	24	16.0	0.013	0.009
Muzzleloader	65	31.5	0.032	0.017
General Gun	165	124.0	0.012	0.010

(a) Success ratio = no. of animals harvested/no. of man-days.

Table 8. Three-year comparison of documented deer and hog harvest, and hunter pressure on the Big Cypress National Preserve.

	DEER			HOG			HUNTER PRESSURE		
	89-90	90-91	91-92	89-90	90-91	91-92	89-90	90-91	91-92
<u>ARCHERY</u>									
Bear Island	6	2	6	11	9	12	490	565	595
Deep Lake	1	-	-	1	-	-	20	-	-
Corn Dance	0	0	2	1	0	1	275	245	195
Turner River	1	1	0	0	1	5	280	350	445
Stairsteps	0	1	0	2	1	1	575	365	440
Loop	2	2	2	4	2	5	95	135	170
Total	10	6	10	19	13	24	1735	1660	1845
<u>MUZZLELOADING</u>									
Bear Island	6	9	9	13	17	20	555	540	570
Deep Lake	0	-	-	1	-	-	40	-	-
Corn Dance	0	6	7	0	0	6	290	265	265
Turner River	7	7	9	7	6	20	370	265	570
Stairsteps	5	8	8	9	3	10	630	405	480
Loop	6	7	4	2	7	9	125	150	145
Total	24	37	37	32	33	65	2010	1625	2030
<u>GENERAL GUN</u>									
Bear Island	26	28	23	33	57	26	4080	2520	2538
Deep Lake	3	1	0	0	0	0	510	80	108
Corn Dance	14	22	14	4	12	18	2020	1495	1591
Turner River	20	26	41	13	21	43	3935	3775	4044
Stairsteps	67	46	79	42	30	67	6060	2345	4078
Loop	22	16	12	11	14	11	1240	840	849
Total	152	139	169	103	134	165	17845	11055	13208
<u>COMBINED</u>									
Bear Island	38	39	38	57	83	58	5125	3625	3703
Deep Lake	4	1	0	2	0	0	570	80	108
Corn Dance	14	28	23	5	12	25	2585	2005	2051
Turner River	28	34	50	20	28	68	4585	4390	5059
Stairsteps	72	55	87	53	34	25	7265	3115	4998
Loop	30	25	18	17	23	78	1460	1125	1164
Total	186	182	216	154	180	254	21590	14340	17083

Table 9. Archery season harvest summary Big Cypress National Preserve,
1991-92.

WEEK 1991-92 dates	DEER		HOG		HUNTER ACTIVITY (man-days)	
	1991-92	Prior 2 yr. avg.	1991-92	Prior 2 yr. avg.	1991-92	Prior 2 yr. avg.
1 (9-7 to 9-8)	2	2.5	8	4.5	665	570
2 (9-9 to 9-15)	4	3.0	7	6.0	345	395
3 (9-16 to 9-22)	2	0.5	4	3.5	375	340
4 (9-23 to 9-29)	1	1.0	3	1.0	245	285
5 (9-30 to 10-6)	1	2.0 [†]	2	2.0 [†]	215	215 [†]
TOTAL	10	9.0	24	17.0	1845	1805

[†] Includes only 1990-91 archery season.

Table 10. Muzzleloader season harvest summary Big Cypress National Preserve, 1991-92.

WEEK	DEER		HOG		HUNTER ACTIVITY (man-days)	
1991-92 dates	1991-92	Prior 2 yr. avg.	1991-92	Prior 2 yr. avg.	1991-92	Prior 2 yr. avg.
1 (10-12 to 10-13)	8	9.0	22	9.0	875	840
2 (10-14 to 10-20)	20	14.0	26	17.0	645	510
3 (10-21 to 10-27)	9	7.5	17	5.5	510	468
TOTAL	37	30.5	65	31.5	2030	1818

Table 11. General Gun season harvest summary, Big Cypress National Preserve, 1991-92.

WEEK	DEER		HOG		HUNTER ACTIVITY (man-days)	
1991-92 dates	1991-92	Prior 2 yr. avg.	1991-92	Prior 2 yr. avg.	1991-92	Prior 2 yr. avg.
1 (11-16 to 11-17)	40	30.5	36	22.0	2405	2343
2 (11-18 to 11-24)	51	39.5	50	26.0	2595	2723
3 (11-25 to 12-01)	23	12.5	20	22.5	2095	1185
4 (12-02 to 12-08)	19	11.5	18	14.5	1451	1403
5 (12-9 to 12-15)	10	20.0	12	12.5	1370	2465
6 (12-16 to 12-22)	6	10.0	14	9.0	1029	1408
7 (12-23 to 12-29)	15	15.0	9	6.5	1693	1480
8 (12-30 to 01-01)	5	5.0	6	2.0	570	953
9	-	3.0 [*]	-	9.0 [*]	-	985 [*]
TOTAL	169	147.0	165	124.0	13208	14945

^{*} Includes only 1989-90 general gun season.

Table 12. Age structure of male white-tailed deer harvested on the Big Cypress National Preserve by unit of harvest, 1991-92.

AGE CLASS	BEAR ISLAND		TURNER RIVER		LOOP		STAIRSTEPS		CORN DANCE		ALL UNITS COMBINED	
	#	%	#	%	#	%	#	%	#	%	#	%
0.5	0	-	0	-	0	-	0	-	0	-	0	-
1.5	19	61.3	6	22.2	2	12.5	14	18.7	4	25.0	45	27.3
2.5	7	22.6	10	37.0	4	25.0	37	49.3	3	18.8	61	37.0
3.5	4	12.9	6	22.2	6	37.5	17	22.7	8	50.0	41	24.8
4.5	1	3.2	2	7.4	2	12.5	6	8.0	0	-	11	6.7
5.5+	0	-	3	11.1	2	12.5	1	1.3	1	6.2	7	4.2
Sample Size	31		27		16		75		16		165	

Table 13. Weight and antler characteristics of male deer harvested during 1991-92, Big Cypress National Preserve.

AGE CLASS	SAMPLE SIZE BY UNIT						AVERAGE DRESSED WEIGHT (LBS.)					
	I [†]	III	IV	V	VI	ALL	I	III	IV	V	VI	ALL
0.5	-	-	-	-	-	-	-	-	-	-	-	-
1.5	12	4	1	10	3	30	80	56	60	59	58	67
2.5	6	6	4	23	1	40	78	78	63	69	70	71
3.5	2	3	4	13	3	25	76	72	68	77	88	76
4.5	1	1	2	2	0	6	70	90	80	81	-	80
5.5+	0	2	2	1	1	6	-	93	68	90	100	85
TOTAL	21	16	13	49	8	107	78	74	67	70	76	72

AGE CLASS	AVERAGE ANTLER MAIN BEAM CIRCUMFERENCE (cm)						AVERAGE ANTLER MAIN BEAM LENGTH (cm)					
	I	III	IV	V	VI	ALL	I	III	IV	V	VI	ALL
0.5	-	-	-	-	-	-	-	-	-	-	-	-
1.5	5.1	5.0	4.9	4.7	5.1	4.9	16.2	12.7	13.5	14.1	14.4	14.8
2.5	6.4	6.4	5.6	6.8	6.4	6.6	25.7	23.1	16.5	19.4	22.7	20.5
3.5	7.3	7.2	7.7	7.8	7.5	7.6	28.6	27.2	24.2	20.3	30.5	24.7
4.5	7.2	8.3	8.8	8.2	-	8.2	31.5	33.1	28.5	30.6	-	30.8
5.5+	-	9.3	8.1	10.8	12.0	9.6	-	34.6	27.0	26.5	30.0	30.7
TOTAL	5.8	6.9	7.0	6.8	7.0	6.7	20.7	24.2	22.1	19.6	25.1	21.3

AGE CLASS	AVERAGE NUMBER OF POINTS					
	I	III	IV	V	VI	ALL
0.5	-	-	-	-	-	-
1.5	3.5	2.0	2.0	2.1	2.8	2.8
2.5	6.3	6.0	4.5	4.7	5.5	5.1
3.5	7.3	6.0	6.5	4.9	7.3	6.0
4.5	8.0	8.5	8.0	7.0	-	7.6
5.5+	-	8.0	6.0	8.0	7.0	7.3
TOTAL	4.9	5.8	5.8	4.6	5.8	5.1

[†]Units: 1 = Bear Island, III = Turner River, IV = Loop, V = Stairsteps, VI = Corn Dance

Table 14. Number of spikes, percent spikes and average main beam length of adult deer harvested on the Big Cypress National Preserve, 1991-92.

AGE CLASS	NUMBER OF SPIKES						% SPIKES IN AGE CLASS						MAIN BEAM LENGTH OF SPIKES (inches)			
	I(a)	III	IV	V	VI	ALL	I	III	IV	V	VI	ALL	0-1	1-3	3-5	>5
1.5	5	4	1	9	3	22	35.7	100.0	100.0	90.0	75.0	66.7	-	-	3	19
2.5	-	-	-	5	-	5	-	-	-	16.1	-	9.8	-	-	1	4
3.5	-	-	1	5	-	6	-	-	16.7	31.3	-	15.4	-	-	-	6
4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.5+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(a) Units: I = Bear Island, III = Turner River, IV = Loop, V = Stairsteps, VI = Corn Dance.

Table 15. Mean physical condition values of adult does collected in Collier Enterprises (CE), Bear Island (BI), Florida Panther National Wildlife Refuge (PR), Fakahatchee Strand State Preserve (FS), and Corn Dance Unit (CDU), 1986-1990. Column values followed by the same subscript were not different ($p < 0.05$)

Area	No.	Age	Kidney fat index ¹	Tail fat ²	Heart fat ²	Peri- cardial fat ²	Kidney fat ²	Physical condition value ³
CE	23	2.9	42.8 a	6.1 a	6.1 a	6.9 a	7.0 a	9.1 a
BI	29	2.8	40.4 a	5.6 a	5.3 ab	6.1 ab	5.5 b	8.7 a
PR	24	3.3	27.6 ab	4.0 b	4.3 b	4.9 abc	4.3 bc	7.1 b
FS	22	2.5	21.7 b	3.7 b	4.0 b	4.6 bc	4.3 bc	7.4 b
CDU	22	2.4	19.5 b	2.9 b	4.0 b	3.8 c	3.4 c	6.5 b

1. Kidney fat index is calculated by the following: weight of the kidney fat/weight of the kidney X 100. It is expressed as a percentage.
2. Fat levels were ranked from 1 - 9 with 1 representing very low or absent fat.
3. Physical condition was ranked from 1 - 12 with 1 representing very poor condition.

Table 16. Mean APC's of adult deer collected in Bear Island (BI), Fakahatchee Strand State Preserve (FS), Corn Dance Unit (CDU), Florida Panther National Wildlife Refuge (PR) and Collier Enterprises (CE) 1986 - 1990.

	BI	FS	CDU	PR	CE
1986	847	1561			
1987	629	495	1060	1058	2422
1988	448	987	2158	1289	816
1989	1123	596	913	210	424
1990	582	713	948	893	538
MEAN	726	870	1270	863	1050

Table 17. Mean reproductive condition of adult does collected in October 1984-1990. Asterisk indicates significant area difference ($p < 0.025$).

AREA ¹	NUMBER	AGE	PERCENT PREGNANT	FETUS/ PREG DOE	NET PRODUCTIVITY
FS	22	2.5	68.2 [*]	1.33	0.91
CDU	29	2.5	90.0	1.04	0.90
PR	24	3.3	91.7	1.14	1.04
BI	37	2.8	93.1	1.26	1.17
CE	23	2.9	95.6	1.31	1.26

1. FS = Fakahatchee Strand State Preserve
 CDU = Corn Dance Unit of Big Cypress National Preserve
 PR = Florida Panther National Wildlife Refuge
 BI = Bear Island Unit of Big Cypress National Preserve
 CE = Collier Enterprises

Table 18. Survival rates for radio-collared white-tailed does, Bear Island Unit, Big Cypress National Preserve, Florida, May 1987 to June 1991.

Interval	Number of deer	Number of deaths Yi	Number of radio-days Xi	Interval length (days) n	Interval survival Si	Annual survival
Summer87	15	1	1804	123	0.934	
Hunting87	14	1	1677	122	0.930	
Spring88	14	2	1598	121	0.859	0.746
Summer88	18	0	2214	123	1.000	
Hunting88	29	3	3404	122	0.898	
Spring89	26	3	2929	120	0.884	0.794
Summer89	22	0	2706	123	1.000	
Hunting89	31	3	3638	122	0.904	
Spring90	33	2	3894	120	0.940	0.850
Summer90	30	2	3541	123	0.933	
Hunting90	28	1	3310	122	0.964	
Spring91	25	1	2964	120	0.960	0.863
Average Annual Survival						0.813
95% confidence interval						(0.71, 0.92)

Table 19. Physical characteristics of wild hogs harvested on the Big Cypress National Preserve, 1983-92.

YEAR	SAMPLE SIZE	AVERAGE DRESSED WEIGHT (lbs.)	AVERAGE BODY LENGTH (cm.)(a)	AVERAGE SHOULDER HEIGHT (cm.)
1983-84	126	71(20-198)	114(42-170)	59(15-90)
1984-85	119	71(18-350)	116(77-164)	61(40-90)
1985-86	67	75(18-175)	116(54-152)	64(28-90)
1986-87	75	70(20-155)	115(78-155)	63(36-88)
1987-88	101	71(16-245)	115(75-166)	62(39-98)
1988-89	108	83(20-238)	120(68-158)	63(22-85)
1989-90	110	66(25-180)	117(85-171)	61(45-87)
1990-91	134	77(25-165)	118(71-160)	63(18-90)
1991-92	158	78(25-235)	120(47-170)	64(27-90)

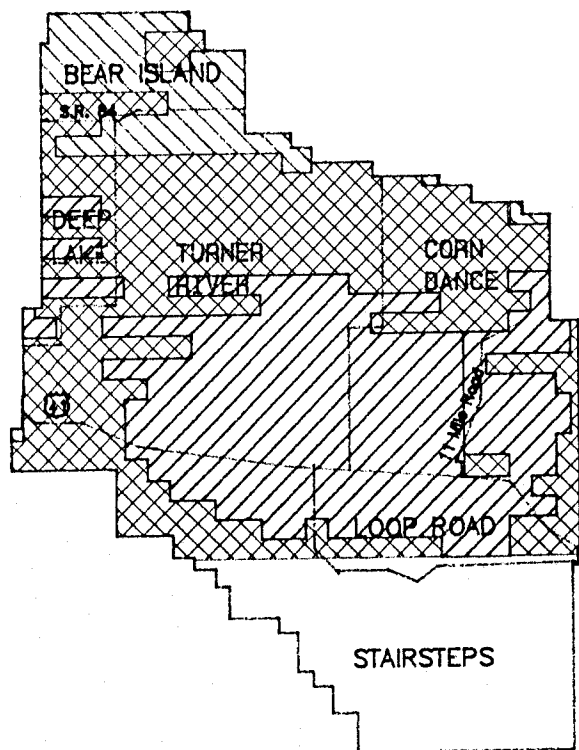
(a) Body length does not include tail

Table 20. Comparison by sex of physical characteristics of wild hogs harvested on Big Cypress National Preserve, 1983-92.

YEAR	SEX	SAMPLE SIZE	AVERAGE DRESSED WEIGHT (lbs.)	AVERAGE BODY LENGTH (cm.)	AVERAGE SHOULDER HEIGHT (cm.)
1983-84	F	52	58(22-145)	113(42-170)	55(16-76)
	M	74	81(20-198)	115(47-149)	61(19-90)
1984-85	F	64	62(18-150)	113(77-142)	58(40-74)
	M	55	82(18-350)	120(78-164)	65(41-90)
1985-86	F	29	61(20-125)	115(57-146)	62(28-75)
	M	38	85(18-175)	117(54-152)	65(31-90)
1986-87	F	40	59(20-150)	111(78-145)	60(36-79)
	M	35	83(20-155)	118(78-155)	66(40-88)
1987-88	F	45	53(16-101)	109(75-145)	57(39-74)
	M	56	85(22-245)	120(87-166)	66(42-98)
1988-89	F	45	67(20-156)	116(68-144)	60(22-80)
	M	62	93(30-238)	122(84-158)	65(42-85)
1989-90	F	54	59(25-150)	115(85-171)	59(46-80)
	M	56	73(25-180)	118(88-162)	62(45-87)
1990-91	F	58	65(25-145)	114(71-139)	60(18-85)
	M	76	85(25-165)	122(84-160)	66(18-90)
1991-92	F	69	65(25-200)	114(79-147)	61(43-88)
	M	89	88(25-235)	124(47-170)	66(27-90)

Table 21. Comparison of wild hogs harvested on the Big Cypress National Preserve in the Stairsteps and Bear Island units, 1983-92.

YEAR	UNIT	SAMPLE SIZE	AVERAGE DRESSED WEIGHT (lbs.)	AVERAGE BODY LENGTH (cm.)	AVERAGE SHOULDER HEIGHT (cm.)
1983-84	Bear Island	70	77(24-198)	115 (47-170)	61(19-90)
	Stairsteps	38	61(20-135)	110 (42-144)	55(24-72)
1984-85	Bear Island	49	74(20-350)	115 (81-164)	61(42-90)
	Stairsteps	44	62(18-136)	113 (77-148)	59(40-82)
1985-86	Bear Island	21	92(50-155)	121(100-143)	68(59-90)
	Stairsteps	23	55(18-145)	111 (76-141)	61(40-82)
1986-87	Bear Island	22	71(20-150)	113 (78-136)	65(36-88)
	Stairsteps	31	80(30-155)	119 (78-155)	65(46-83)
1987-88	Bear Island	35	80(25-245)	118 (96-166)	69(48-98)
	Stairsteps	39	60(16-151)	110 (75-140)	57(39-76)
1988-89	Bear Island	47	97(30-238)	122 (84-158)	69(47-85)
	Stairsteps	37	73(32-150)	118 (90-153)	60(42-80)
1989-90	Bear Island	49	69(30-180)	118 (85-162)	62(47-87)
	Stairsteps	31	67(25-160)	115 (88-147)	61(47-80)
1990-91	Bear Island	70	76(30-165)	116 (71-154)	64(22-88)
	Stairsteps	22	69(25-140)	118 (86-142)	64(43-79)
1991-92	Bear Island	47	84(35-235)	122 (79-170)	67(46-90)
	Stairsteps	50	79(26-155)	123 (80-147)	65(27-88)



MARCH 5, 1992

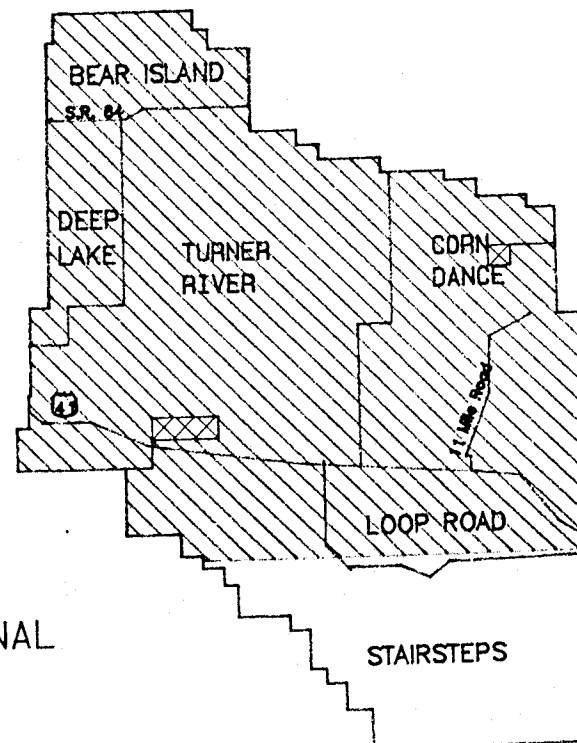


BIG CYPRESS
NATIONAL
PRESERVE

WET
TRANSITIONAL
DRY

SCALE

0 10 Km



AUGUST 6, 1992

Figure 1. Comparison of dry and wet season hydropatterns on the Big Cypress National Preserve, 1991.

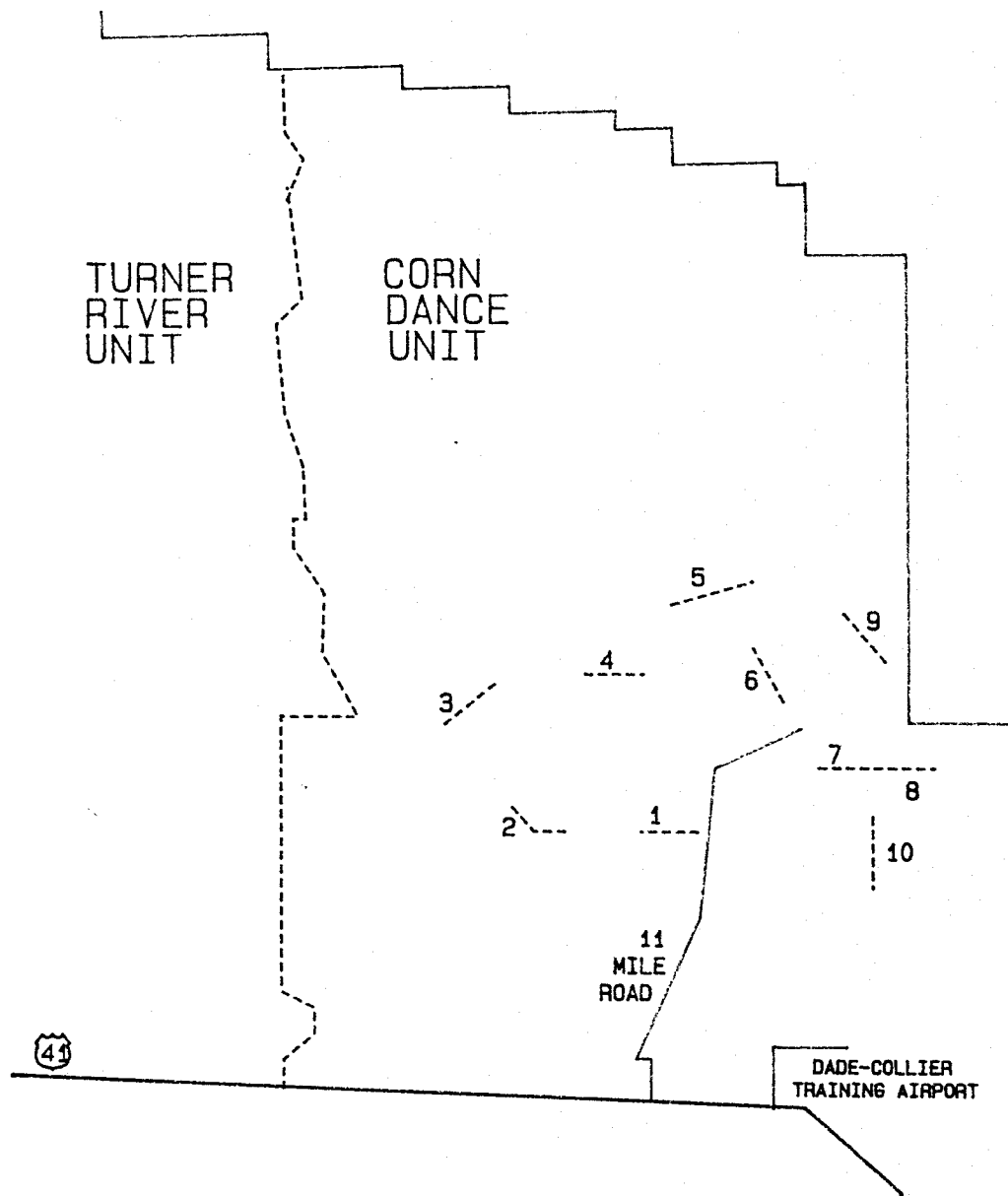


Figure 2. Deer track survey transects, Corn Dance Unit, Big Cypress National Preserve 1985-1991.

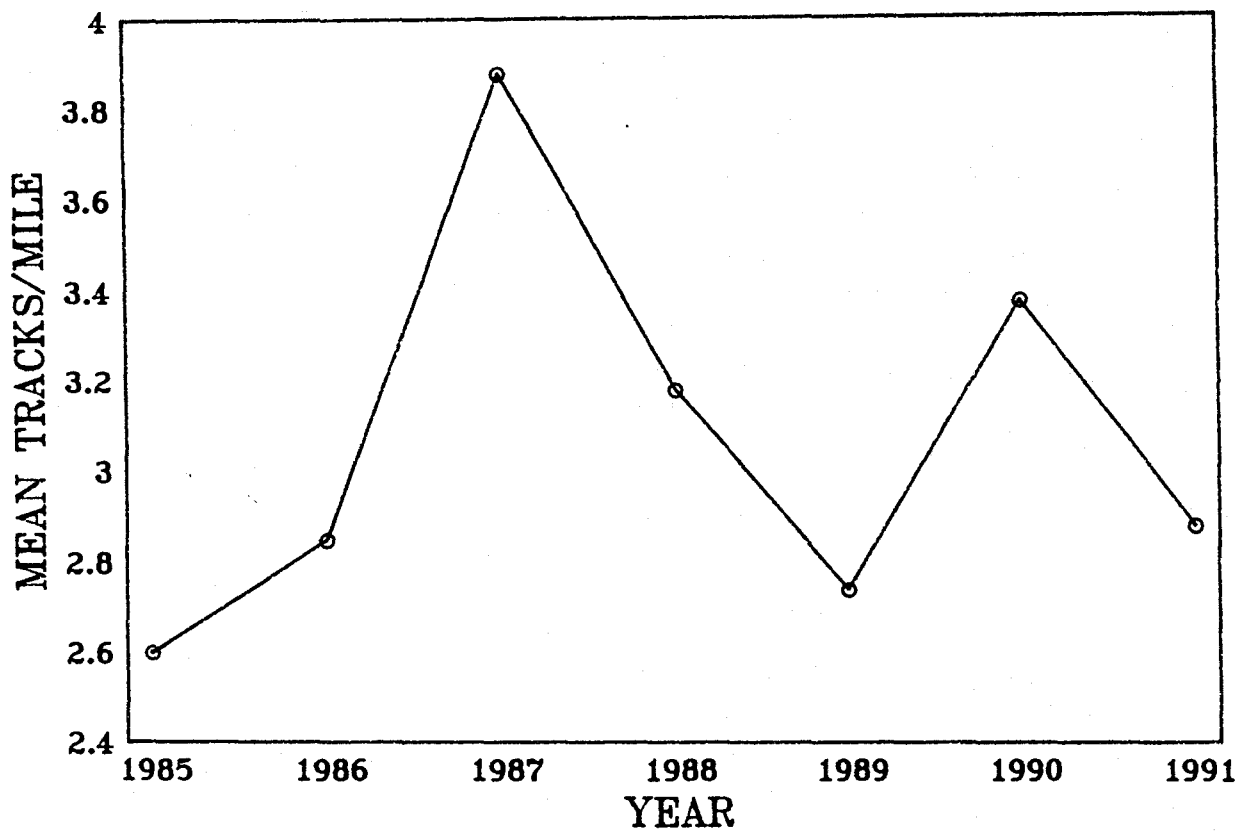


Figure 3. Mean number of deer tracks per one mile transect in the Corn Dance Unit of Big Cypress National Preserve 1985-1991.

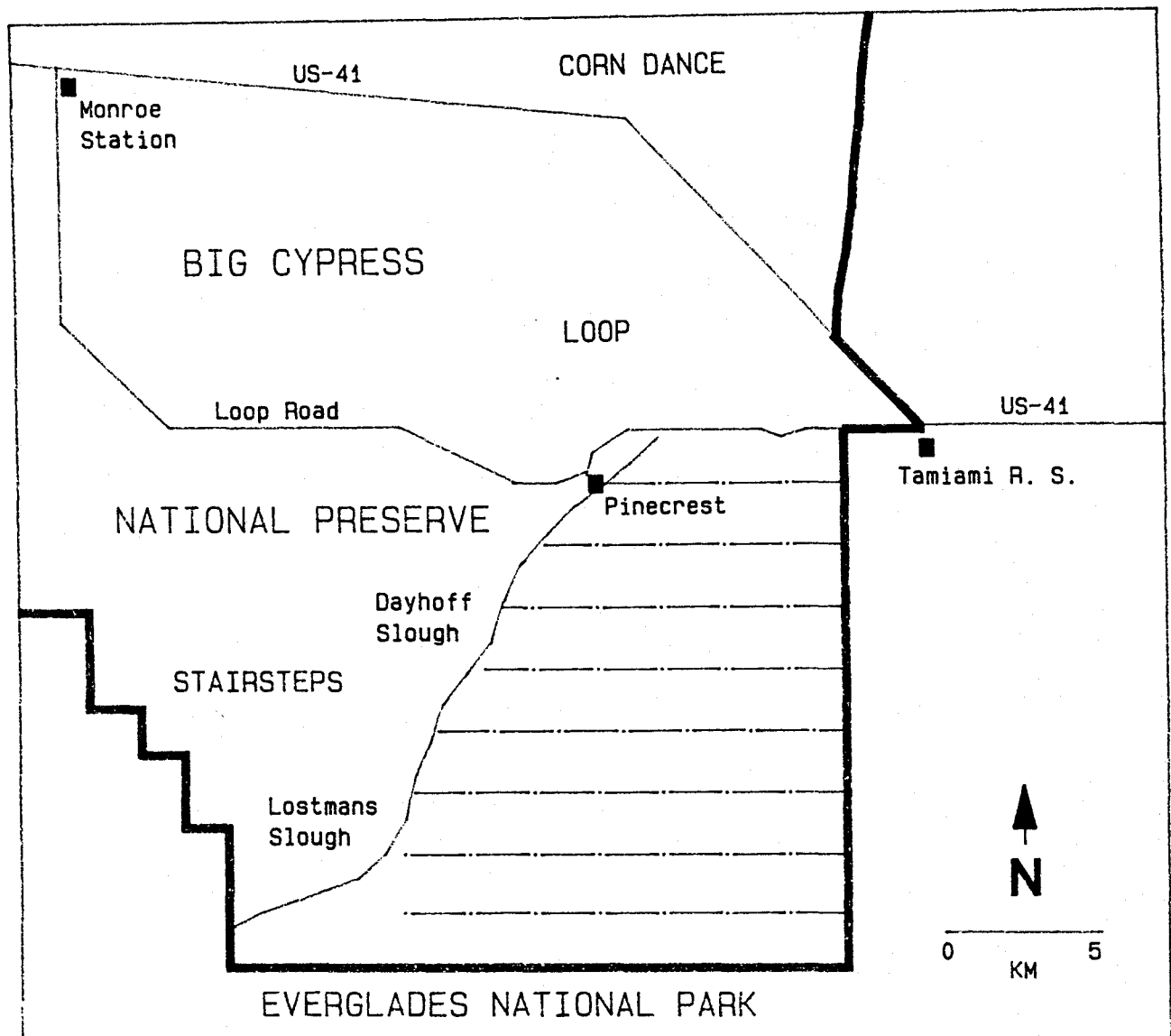


Figure 4. Survey transects and general survey area for aerial deer census, eastern Stairsteps Unit, BCNP. 1985-1991.

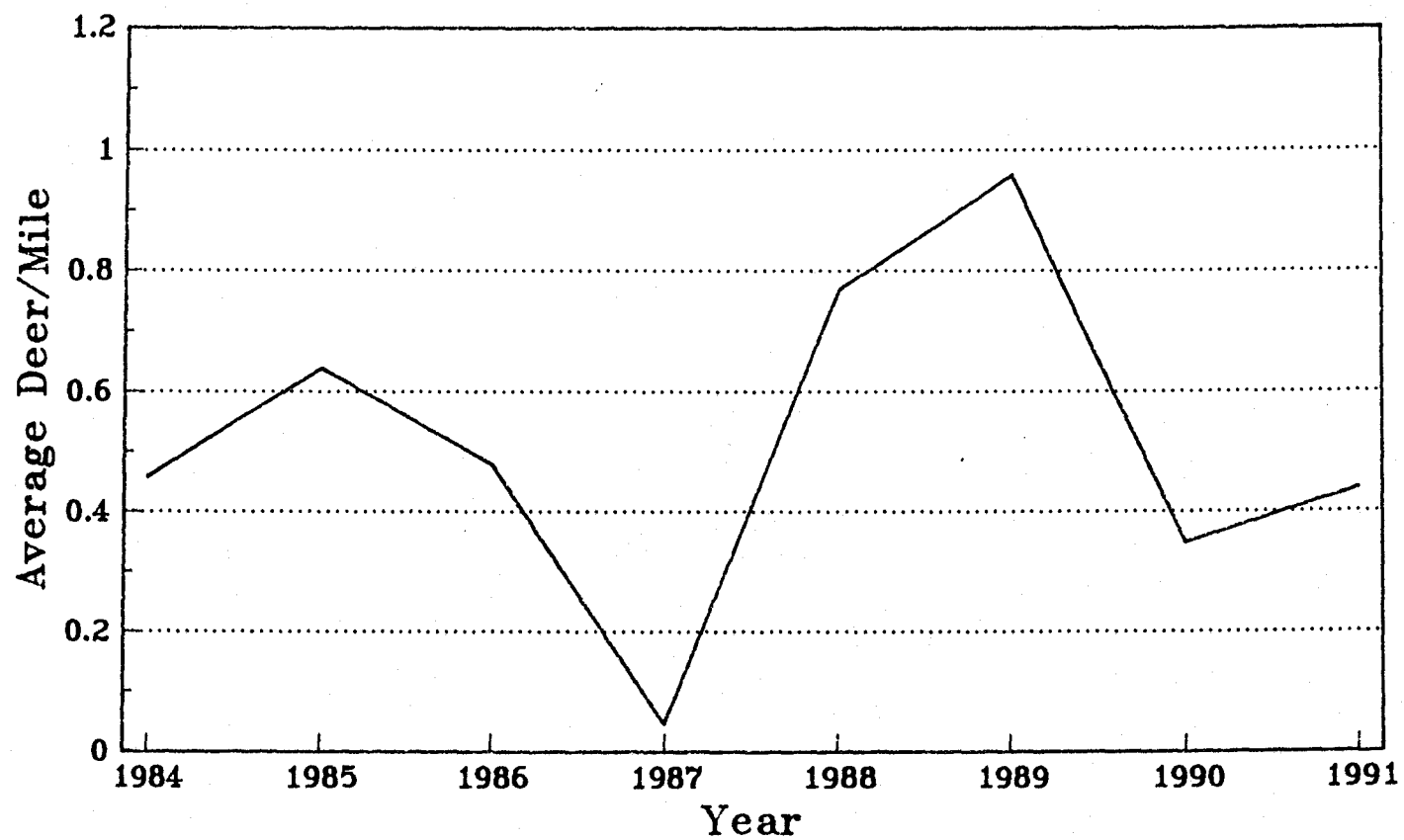


Figure 5. Average number of deer observed per mile in the eastern Stairsteps Unit, BCNP. 1984-1991.

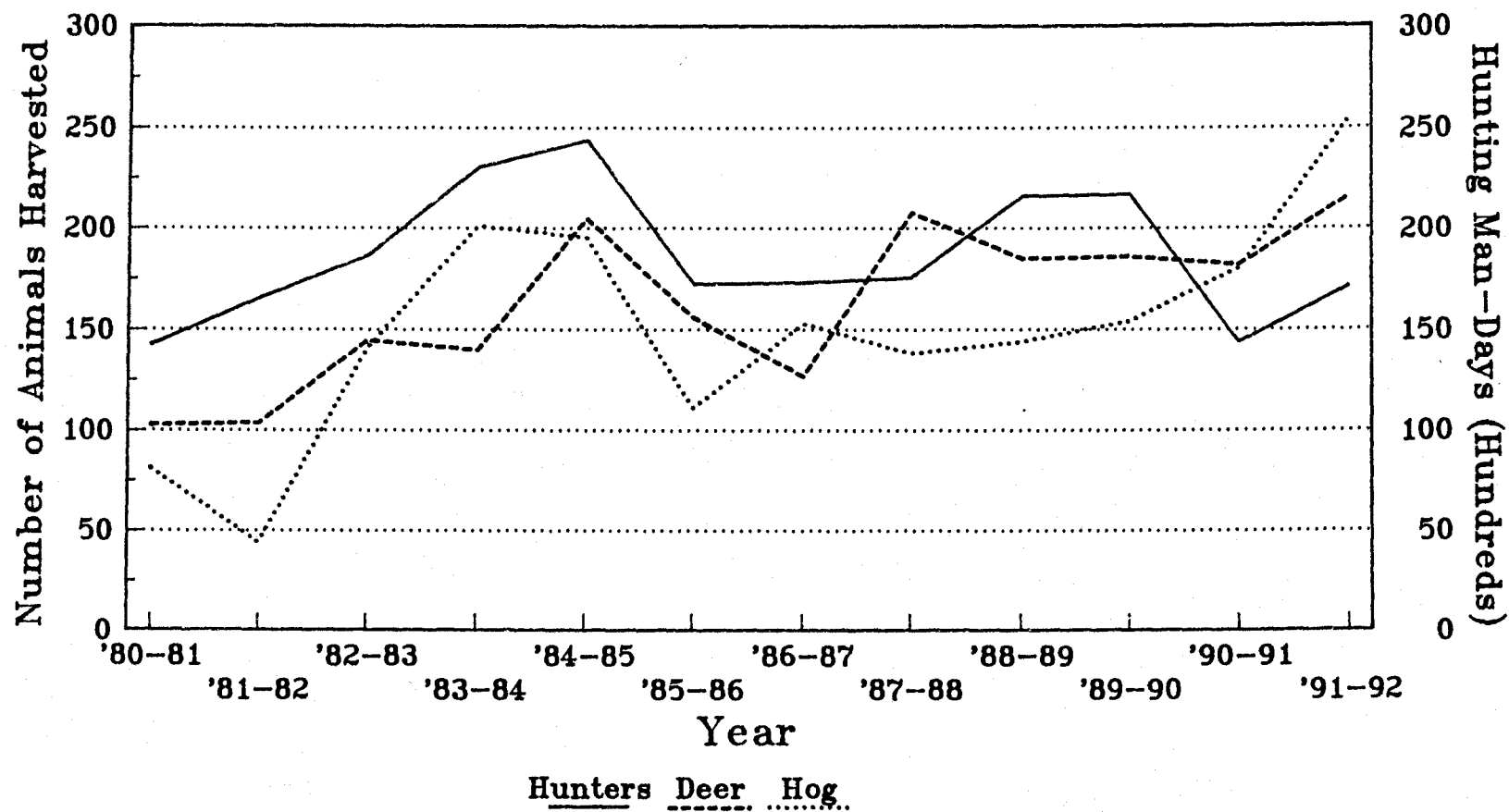


Figure 6. Hunting pressure and harvest of wild hog and white-tailed deer on the Big Cypress National Preserve, 1980-1992.

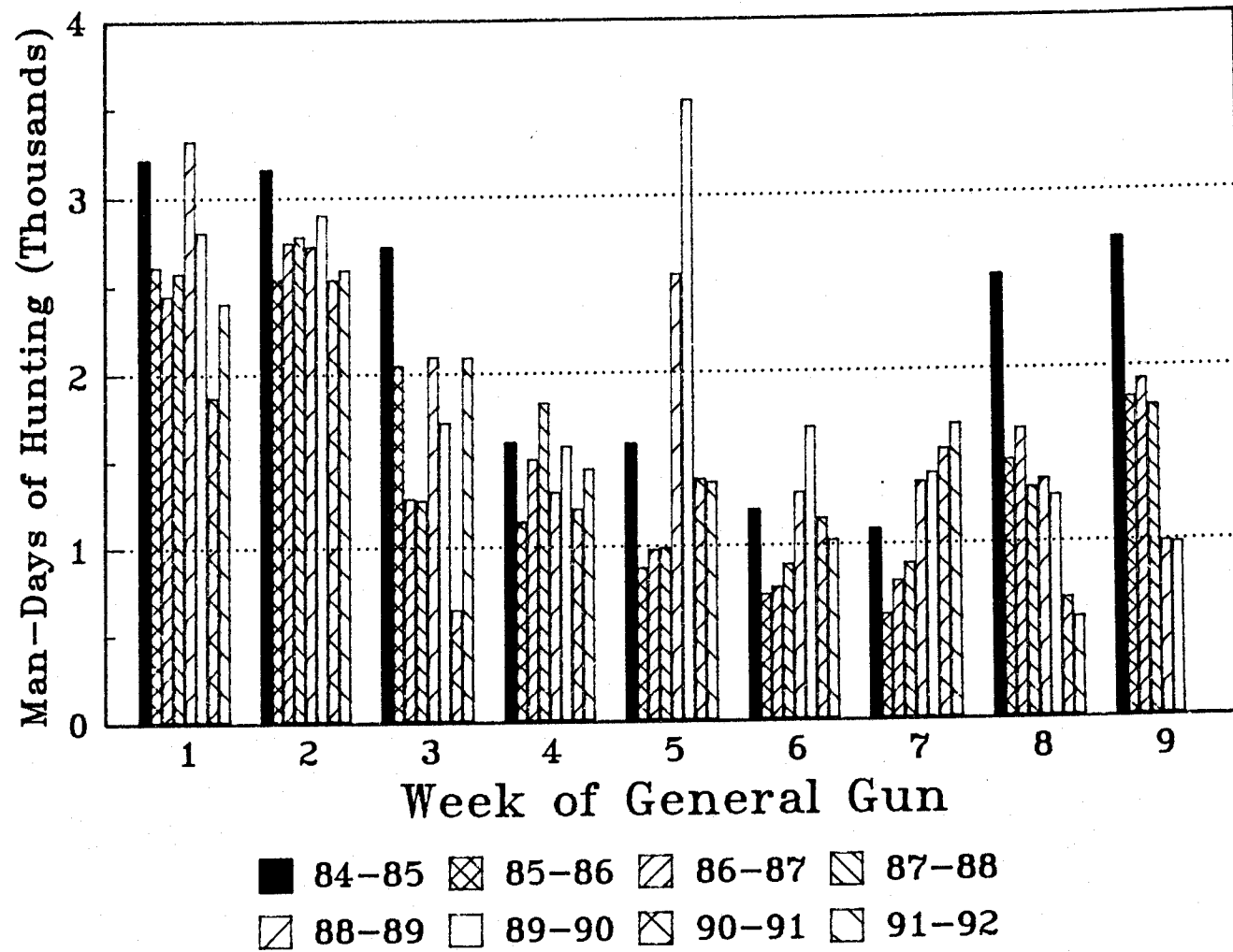


Figure 7. General Gun season hunting pressure by week, Big Cypress National Preserve, 1984-1992.

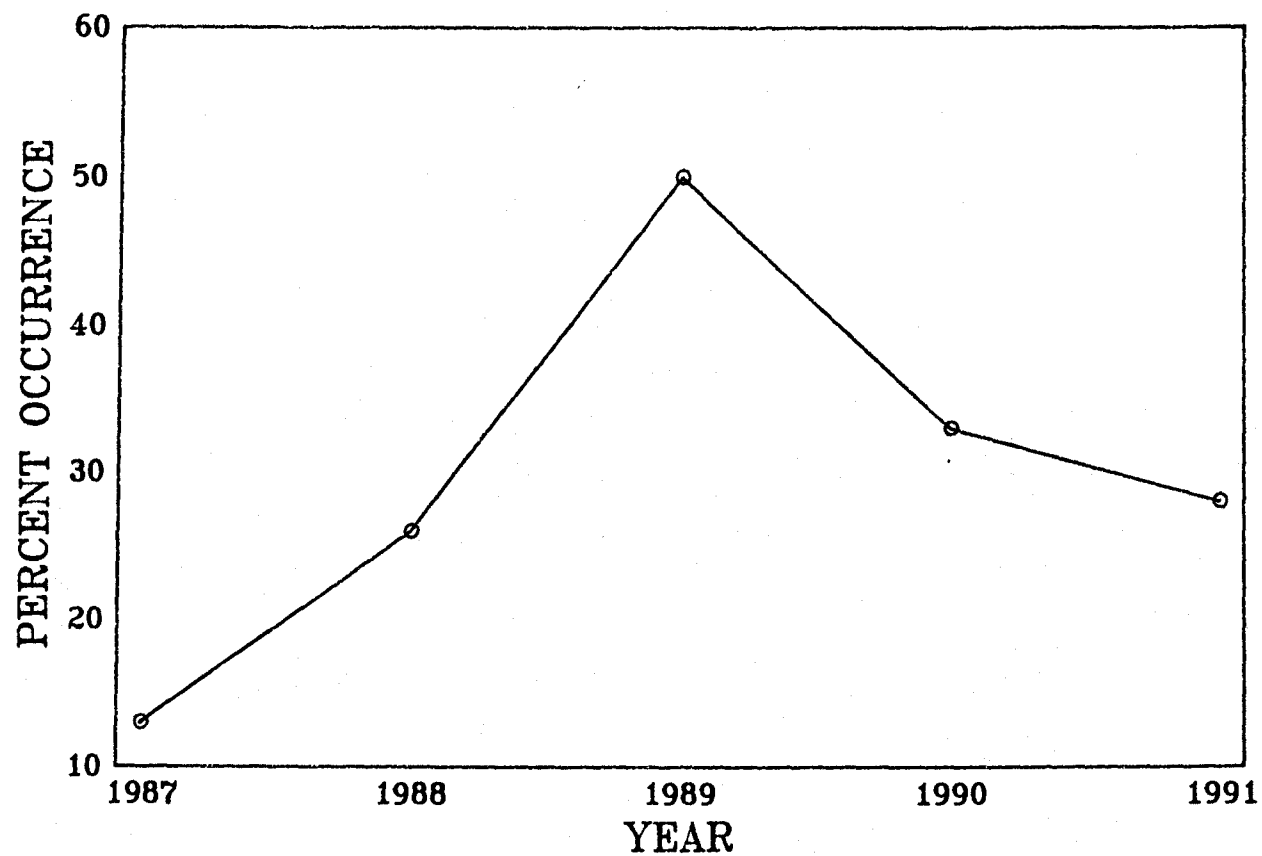
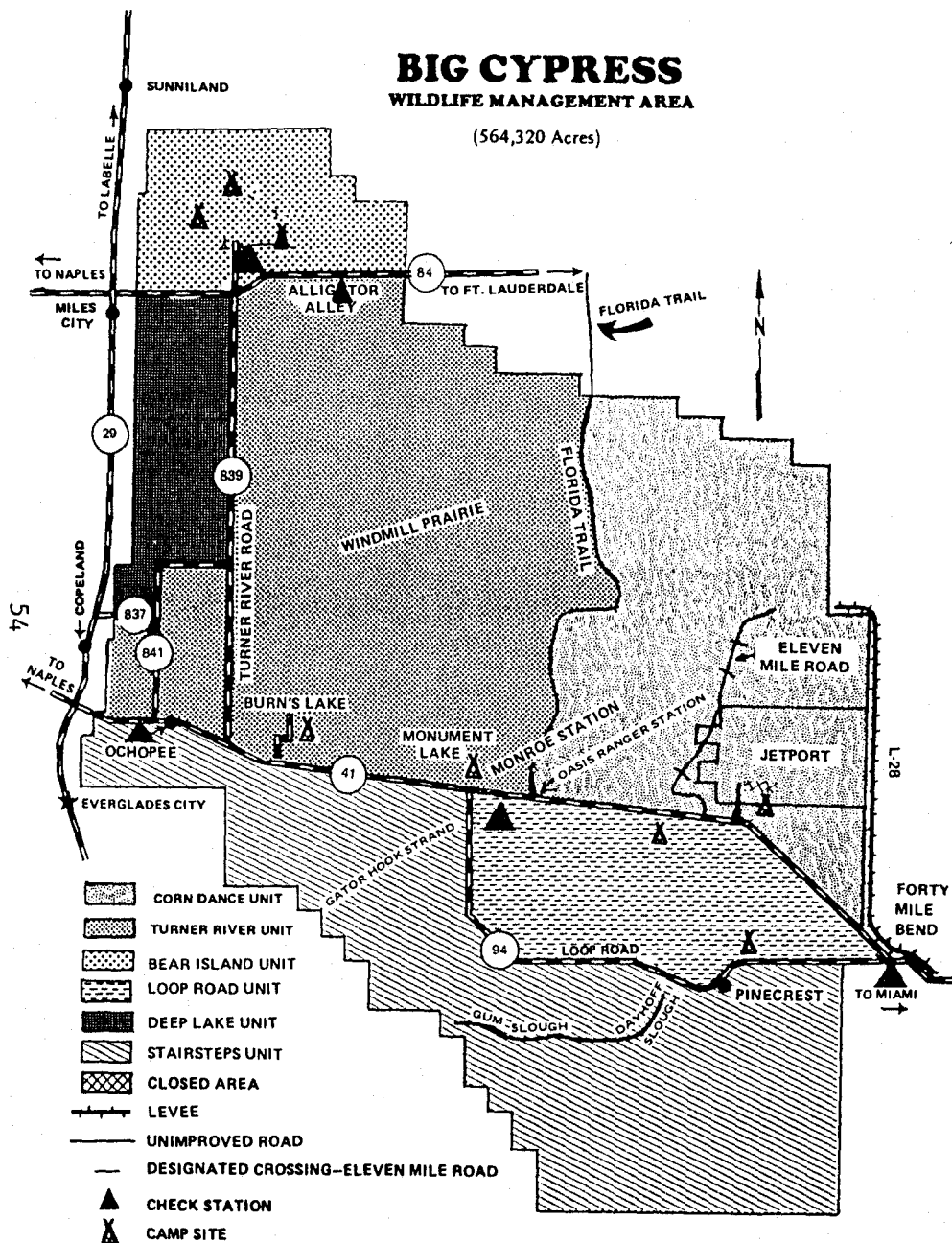


Figure 8. Abundance of wild hog sign on white-tailed deer track count transects in the Corn Dance Unit of BCNP, 1987-1991.

Appendix A. Big Cypress Wildlife Management Area Regulations 1991-92.

BIG CYPRESS WILDLIFE MANAGEMENT AREA

(564,320 Acres)

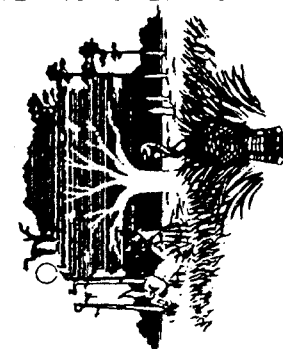


BIG CYPRESS

WILDLIFE
MANAGEMENT
AREA

1991-92

REGULATIONS
SUMMARY
AND AREA MAP



A COOPERATIVE PUBLIC HUNTING AREA
NATIONAL PARK SERVICE
FLORIDA GAME & FRESH WATER FISH
COMMISSION

An Equal Opportunity Agency

This brochure is designed to provide the public with information and a summary of regulations pertaining to hunting on the Big Cypress Wildlife Management Area. For the exact wording of the wildlife laws and regulations, see Florida Game and Fresh Water Fish Commission's wildlife code on file with the Secretary of State and state libraries. This brochure and the quota hunt application form should provide the information necessary for you to plan your hunting activities.

For information pertaining to hunting on private lands and trapping, consult the current Florida Hunting Handbook and Guidelines for the Taking of Furbearing Animals in Florida. These publications are available from any Commission office as well as county tax collectors and their subagents.

PERMIT, STAMP AND LICENSE INFORMATION:

Persons utilizing the wildlife management areas are required to have appropriate licenses, stamps and permits. Florida residents who are 65 years of age or older and residents certified totally and permanently disabled may obtain exemption certificates for most licenses, stamps and permits from the county tax collector. Hunters under age 16 are exempt from all permit, stamp and license requirements on this area.

Unless exempted, each hunter on this wildlife management area must have the following in his possession and display them upon request of any Commission employee.

1. Hunting License: Florida hunting licenses may be purchased from offices of county tax collectors or their subagents. Information on the categories and costs of hunting licenses is available in the Florida Hunting Handbook.
2. Wildlife Management Area Stamp: This \$25 stamp may be purchased from county tax collectors or their subagents.
3. Quota Permits: A no-cost regular quota hunt permit is required to hunt on the Bear Island, Stairsteps, Loop Road, Corn Dance, Turner River and Deep Lake units of this wildlife management area November 16 through 24, November 25 through December 1 and December 24 through January 1 of the general gun season. A no-cost special quota hunt permit is required to hunt on the Bear Island Unit from October 12 through 20 of the muzzleloading gun season.

A daily hunt permit (available at the check station) is required for hunting each day during non-quota periods of general gun and muzzleloading gun seasons on the Bear Island Unit.

Regular quota permits are available in the following numbers by management unit: Bear Island 200, Stairsteps 1,000, Deep Lake 200, Corn Dance 300, Turner River 500 and Loop Road 250. There are 200 special quota permits available for the muzzleloading gun hunt in the Bear Island Unit.

Regular and special quota hunt permit applications are available from county tax collectors or their subagents on or about June 1. To apply for either permit, obtain a regular or special quota hunt application and follow the printed instructions.

Transfer of Permits: Quota hunt permits are transferable. No other permits may be transferred. The sale or purchase of any quota hunt permit is prohibited.

4. Archery Stamp: This \$5.00 stamp is required when hunting during the archery season. This stamp is available from county tax collectors or their subagents.

5. Muzzleloading Gun Stamp: This \$5.00 stamp is required when hunting during the muzzleloading gun season. This stamp is available from county tax collectors or their subagents.

6. Wild Turkey Stamp: This \$5.00 stamp is required if hunting turkeys and may be purchased from county tax collectors or their subagents.

7. State Waterfowl Stamp: This \$3.00 stamp is required while hunting ducks and may be purchased from county tax collectors or their subagents.

8. Federal Duck Stamp: Any hunter 16 years of age or older must possess a federal duck stamp while hunting ducks. This \$15.00 stamp is available at post offices.

9. National Park Service Off-Road Vehicle Registration Permit: Any vehicle used off roads on the Big Cypress Wildlife Management Area must have this permit. This includes any 4-wheel-drive vehicle having a current license plate. The National Park Service off-road vehicle registration permit is available at the Oasis Ranger Station. Call for more information: (813) 695-4111 or (813) 695-2000.

BAG AND POSSESSION LIMITS:

1. Deer, wild hogs and bearded turkeys—Daily limit 1, season limit 2 for each game species (all hunts combined).
2. Gray squirrel, quail or rabbit—Daily limit 12, possession limit 24, for each game species.
3. Raccoon, opossum, armadillo, beaver, coyote, skunk and nutria—No bag limit.
4. Migratory game birds—See migratory game bird hunting regulations pamphlet.

GENERAL WILDLIFE MANAGEMENT AREA REGULATIONS:

In addition to the regulations which follow, all general laws and regulations relating to wild animal life or freshwater aquatic life shall apply unless specifically excepted for this wildlife management area. Hunting or the taking of wildlife or fish on this area shall be allowed only during the open seasons and in the manner set forth herein.

1. Driving a metal object into any tree or hunting from a tree in which a metal object has been driven is prohibited.
2. It is illegal to cut or damage cattle fences.
3. Wild hogs may not be transported alive.
4. Fires are permitted only on designated camping areas or in back country campsites and must be completely extinguished prior to the user leaving the campsite.
5. It is unlawful for any person to leave any garbage or refuse or in any way litter in the management area.
6. Hunters using the Bear Island Unit shall enter and exit ONLY through the designated entry point at the north end of Turner River Road.
7. Entering any fenced area within the Jetport area is prohibited.
8. The wanton or willful waste of wildlife is prohibited.

Appendix A. Continued

9. The removal of any plant is prohibited.
10. The head and evidence of sex may not be removed from the carcass of any deer on the area. Portions of the carcass may be removed immediately prior to cooking.
11. No person shall release any wildlife on this wildlife management area.
12. It is illegal to hunt over bait or place any bait or other food for wildlife on this wildlife management area.
13. Taking fox is prohibited.
14. Taking fox squirrel is prohibited.
15. Taking any turkey while it is on the roost is prohibited.
16. Killing swimming deer is prohibited.
17. Taking or attempting to take game with the aid of live decoys, traps, snares, nets, drugs, lights or recorded game calls is prohibited.
18. Any person hunting deer or accompanying another person hunting deer shall wear at least 500 square inches of daylight fluorescent orange material above the waistline as an outer garment. This is not required when hunting during an archery-only season.
19. Deer and turkey may be dismembered in the field or camp, but each portion shall have a tag affixed to it identifying the name, address and hunting license number of the person who killed it; the date and location at which it was taken; and shall be readily traceable to the portion of the animal bearing the sex identification.

GUNS OR DOGS:

20. Hunting with gun and light is prohibited.
21. Hunting wildlife or the display or use of a gun in a manner capable of taking wildlife on or from the rights-of-way of County Roads 837, 839, 841, State Roads 84, 94, U.S. Highway 41 and Burns Road is prohibited.
22. Authorized hunting equipment or dogs may be taken onto the area after 8 a.m. one day before the opening of the hunt and shall be removed from the area before 6 p.m. one day after the hunt.
23. For taking non-migratory game, only shotguns, rifles, pistols, longbows (including compound and recurved bows), crossbows (during the general gun hunt only) or birds of prey may be used.
24. For hunting deer, muzzleloading guns firing a single bullet must be at least .40 caliber; those firing two or more balls must be 20 gauge or larger.
25. Hunting deer with full-jacketed bullets or any rimfire cartridge is prohibited.
26. Fully automatic firearms, silencer-equipped firearms, centerfire semi-automatic rifles having a magazine capable of holding more than five rounds, explosive or drug-injecting devices and setguns are prohibited.
27. Guns or dogs are allowed only during periods in which their use for hunting is allowed.
28. No person shall have a gun in manual possession while under the influence of alcohol or drugs.
29. Children under the age of 16 may not be in possession of a firearm unless in the presence of a supervising adult.
30. The possession of any firearm containing shells or cartridges or any capped or primed muzzleloading gun is prohibited at campsites or check stations. The discharge of firearms is prohibited on, from or across any campsite or check station.
31. Hunting deer or hogs with dogs is prohibited. All dogs are prohibited in the Loop Road and Deep Lake units. The possession of dogs customarily used for hunting (other than bird dogs and waterfowl retrievers) is prohibited during any period.
32. No person shall allow any dog to pursue or molest wildlife during any period in which hunting with dogs is prohibited.
33. No person shall possess any dog during any period in which hunting with dogs is prohibited, unless such dog is a non-hunting breed and under restraint.

VEHICLES:

NOTICE: Prior to the hunting season, the National Park Service may implement vehicle use regulations different from those printed in this brochure, and these new rules may affect your use of the preserve. You are strongly encouraged to contact the Big Cypress National Preserve office, State Road, Box 110, Satinwood Dr., Ochopee, FL 33943 (813) 695-2000 regarding any new vehicle use regulations prior to your use of the preserve.

34. All vehicles used off roads shall have a National Park Service off-road vehicle registration permit. See Permit, Stamp and License Requirements for more information.

35. Vehicles shall not be parked in such a manner as to obstruct roads, gates, trails or firelanes.

36. Vehicle access or use for the purposes of hunting, fishing or frogging is prohibited except by all-terrain vehicles with 3 or more rubber tires, the front tire(s) of which shall be at least 7 inches wide and the rear tires of which must be at least 9 inches wide and other vehicles with three or more rubber tires of nine-inch minimum width. Airboats are permitted except in the Bear Island, Deep Lake and Loop Road units. Vehicles are prohibited on Loop Road and Deep Lake units and wheeled vehicles are prohibited south and east of Dayhoff Slough and Gum Slough in the Stairsteps Unit except as otherwise indicated. Vehicles shall not be operated off designated roads and trails or outside designated vehicle access areas. In management units other than Loop Road and Deep Lake units, if vehicle access trails or areas have not been designated, vehicles may be operated throughout the unit.

37. No vehicles allowed on the Loop Road and Deep Lake units at any time.

38. Only vehicles equipped with pneumatic tires may be operated on Jetport Road. Parking on the paved portion of the Jetport road is prohibited.

39. Vehicular use by the public on Eleven-Mile Road or the Florida Trail is prohibited. Vehicles may cross Eleven-Mile Road at designated and marked points only. Maps showing the location of crossings over Eleven-Mile Road are available at the Oasis Ranger Station.

40. No motor vehicle shall be operated on any part of this area posted as closed to vehicular traffic.

CAMPING:

41. Camping on the Bear Island Unit is permitted only at designated campsites by the use of tents, trailers or self-propelled camping vehicles. Camping and the use of trailers or other camper units on the Corn Dance, Turner River, Deep Lake, Stairsteps and Loop Road units is restricted to designated sites except that primitive camping (tents) is permitted throughout these units.

CHECK STATIONS:

42. Hunters shall check in and out at a designated check station when entering the area and check out at the same check station when exiting the area.

43. All game taken must be checked and tagged at a check station prior to removal from the area. It is important that as much of the animal as possible remains intact and that it be brought to the check station as soon as possible. Important biological data are obtained from the following animals or animal parts: Deer (head, heart, kidney, liver), hog (head), turkey (wings and tail). If the animal is processed in the field, the above items should be brought to the check station along with the meat. Deer jawbones shall be saved and brought to the check station.

44. No person shall enter or exit the area north of I-75 by any route except via the north end of Turner River Road through the Bear Island check station or at other designated entry points along I-75.

SEARCH:

45. A wildlife officer may search any camp, vehicle or boat when he reasonably believes a violation has been committed.

ARCHERY:

September 7 through October 6, except in Deep Lake Unit where hunting dates are November 16 through January 1.

Permit, Stamp and License Requirements--Hunting license, wildlife management area stamp, archery stamp (not required in Deep Lake Unit). State and federal waterfowl stamps (if hunting ducks). Quota hunt permits (see no. 3 under Permit, Stamp and License Information).

Legal to Take--Deer with one or more antlers at least five inches in length visible above the hairline, wild hogs with a shoulder height of 15 inches or more, gray squirrel, quail, rabbit, opossum, raccoon, beaver, coyote, armadillo, skunk and nutria.

Regulations Unique to the Archery Hunt: In addition to these regulations, all General Wildlife Management Area Regulations shall apply.

1. Possession of firearms or crossbows is prohibited, except that during the early duck season shotguns are permitted for duck hunting on all units except Bear Island and Deep Lake.

2. The transportation of archery equipment on airboats is prohibited.

MUZZLELOADING GUN:

October 12 through 27, except in the Deep Lake Unit.

Permit, Stamp and License Requirements--Hunting license, wildlife management area stamp, muzzleloading gun stamp, and special quota permit (if hunting on the Bear Island Unit during the first 9 days), daily permit (after first 9 days in Bear Island Unit).

Legal to Take--Deer with one or more antlers at least five inches in length visible above the hairline, wild hogs with a shoulder height of 15 inches or more, gray squirrel, quail, rabbit, opossum, raccoon, beaver, coyote, armadillo, skunk and nutria.

Regulations Unique to the Muzzleloading Gun Hunt: In addition to these regulations, all General Wildlife Management Area Regulations shall apply.

1. Only muzzleloading guns are allowed.
2. The transportation of muzzleloading equipment on airboats is prohibited.

GENERAL GUN:

November 16 through January 1, except in the Deep Lake Unit.

Permit, Stamp and License Requirements--Hunting license, wildlife management area stamp, regular quota hunt permit (if hunting during designated quota periods, see Permit, Stamp and License Information), daily hunt permit required on Bear Island Unit if hunting during non-quota periods, state and federal waterfowl stamps (if hunting ducks) and wild turkey stamp (if hunting turkeys).

Legal to Take--Deer with one or more antlers at least five inches in length visible above the hairline, wild hogs with a shoulder height of 15 inches or more, gray squirrel, quail, rabbit, opossum, raccoon, beaver, coyote, armadillo, skunk, nutria. Bearded turkeys or gobblers may be taken only on the Corn Dance, Turner River and Loop Road units.

Regulations Unique to the General Gun Hunt: All General Wildlife Management Area Regulations shall apply and bird dogs and retrievers are permitted except in Loop Road and Deep Lake units.

SMALL GAME:

January 2 through February 12, except in the Deep Lake Unit.

Permit, Stamp and License Requirements--Hunting license, wildlife management area stamp. State and federal waterfowl stamps (if hunting ducks).

Legal to Take--Gray squirrel, quail, rabbit, opossum, raccoon, beaver, coyote, armadillo, skunk and nutria.

Regulations Unique to the Small Game Hunt: In addition to these regulations, all General Wildlife Management Area Regulations shall apply.

1. The possession of centerfire rifles is prohibited.
2. Bird dogs and waterfowl retrievers are permitted, except in the Loop Road and Deep Lake units.

SPRING TURKEY:

March 14 through April 19, except in the Deep Lake Unit.

Permit, Stamp and License Requirements--Hunting license, wildlife management area stamp and wild turkey stamp.

Legal to Take--Bearded turkeys or gobblers.

Regulations Unique to the Spring Turkey Hunt: In addition to these regulations, all General Wildlife Management Area Regulations shall apply.

1. Legal shooting hours are one-half hour before sunrise until 1 p.m.
2. No person shall possess any dog provided that dogs not normally used for hunting and kept under restraint may be possessed.

MIGRATORY GAME BIRDS:

Mourning doves, white-winged doves, snipe, ducks, coots, woodcock and crows may be hunted during seasons established for these species which coincide with the muzzleloading gun, general gun and small game hunts.

Ducks may also be taken during the early duck season (except in the Bear Island and Deep Lake units).

Permit, Stamp and License Requirements--Hunting license, wildlife management area stamp. State and federal waterfowl stamps (if hunting ducks). Quota permit if hunting during any designated quota period.

Legal to Take: See migratory game bird hunting regulations pamphlet. Regulations Unique to Migratory Game Birds--See migratory game bird hunting regulations pamphlet. In addition to these regulations, all wildlife management area regulations contained in this pamphlet shall apply and the use of lead shot for taking ducks and coots is prohibited.

FISHING AND FROGGING:

Permitted throughout the year.

NATIONAL PARK SERVICE REGULATIONS:

This area is a national preserve. In addition to these regulations, all Big Cypress National Preserve regulations shall apply. For further information, contact the Big Cypress National Preserve Office, State Road, Box 110, Satinwood Drive, Ochopee, Florida 33943, (813) 695-2000.

1. Camping is limited to a total of 30 days in a calendar year.
2. The intentional destruction, defacement, or removal of any natural or cultural feature or nonrenewable resource is prohibited.
3. Draining or dumping refuse or wastes from any trailer or other vehicle is prohibited.
4. The collection of plants, rocks, minerals, animal life or other natural objects is permitted only in accordance with written permits obtained in advance from the Superintendent.
5. Constructing a building or other structure is prohibited.
6. Vehicles are prohibited on the Loop Road and Deep Lake units. Vehicles are prohibited on the Florida Trail. Vehicles are permitted only on designated trails in the Bear Island Unit.
7. Motorized vehicles shall not be operated in a manner causing significant damage to wildlife habitat, or to cultural or vegetative resources. The creating of new trails by cutting vegetation or by the use of fill is prohibited.

GENERAL INFORMATION:

1. Small tracts of private property are located within the boundary of the wildlife management area. These lands may be posted against trespass and should not be considered as part of the wildlife management area.
2. If you have any questions about this material, please call the Game and Fresh Water Fish Commission at (407) 640-6100.
3. Effective June 1, 1991, it will be unlawful for any person born on or after June 1, 1975 to take wild animal life without having first successfully completed a Commission-approved hunter safety course.

COOPERATION REQUESTED:

Please do not discharge firearms at anything other than legal game while in a wildlife management area. Target practice and random discharge of firearms have become increasing threats to the quality of the hunting experience.

PLEASE DO NOT LITTER. TAKE TRASH OUT WITH YOU.

In recent years, unauthorized and uncontrolled fires have caused severe damage to area wildlife and wildlife habitats. Controlled fires are beneficial only when they are of the proper size and location, and when area conditions are suitable. **UNCONTROLLED FIRES DO NOT BENEFIT WILDLIFE.** Please use caution with campfires, smoking materials and vehicles to prevent damage to wildlife habitats.

The U.S. Department of the Interior prohibits discrimination on the basis of race, color, national origin, age, sex, or handicap. If you believe that you have been discriminated against in any program, activity, or facility as described above, or if you desire further information, please write to: The Office for Human Resources, U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

This publication is one of 69 produced at an annual cost of \$47,605.00 or \$.05 per copy to provide information to the public about hunting on Florida's Wildlife Management Areas.

Appendix B. Deer survey data, Big Cypress National Preserve,
1984-1990.

Table A. Number of deer tracks observed by transect, Monument/Corn Dance
Unit, 1985-91.

SURVEY DATE	TRANSECT NUMBER	DAY							TOTAL	MEAN
		1	2	3	4	5	6	7		
June 1991	1	6	3	2	5				16	4.0
	2	6	7	2	5				20	5.0
	3	0	1	0	0				1	0.3
	4	5	1	3	2				11	2.8
	5	4	2	1	8				15	3.8
	6	8	5	2	2				17	4.3
	7	2	2	0	1				5	1.3
	8	0	1	1	1				3	0.8
	9	1	3	1	8				13	3.3
	10	3	6	2	3				14	3.5
									115	2.9
May 1990	1	3	4	4	6	6	5		28	4.7
	2	5	7	6	3	5	1		27	4.5
	3	3	3	4	1	1	3		15	2.5
	4	2	1	2	4	2	3		14	2.3
	5	3	4	4	2	2	2		17	2.8
	6	3	3	2	5	4	2		19	3.2
	7	5	2	3	3	5	3		21	3.5
	8	1	3	1	7	3	4		19	3.2
	9	1	4	4	7	5	1		22	3.7
	10	3	3	3	4	4	4		21	3.5
									203	3.4
May 1989	1	7	4	1	4	3	-		19	3.8
	2	7	2	2	3	0	-		14	2.8
	3	5	3	2	3	3	-		16	3.2
	4	4	3	3	5	3	-		18	3.6
	5	2	4	2	2	2	-		12	2.4
	6	3	2	1	4	6	-		16	3.2
	7	4	2	3	0	2	-		11	2.2
	8	3	2	0	1	2	-		8	1.6
	9	3	3	1	2	0	-		9	1.8
	10	3	3	2	3	3	-		14	2.8
									137	2.7

Appendix B., Table A. continued

SURVEY DATE	TRANSECT NUMBER	DAY							TOTAL	MEAN
		1	2	3	4	5	6	7		
May 1988	1	5	5	7	4	-	-		21	5.3
	2	3	3	5	6	-	-		17	4.3
	3	4	1	1	3	-	-		9	2.3
	4	3	3	4	0	-	-		10	2.5
	5	4	6	7	3	-	-		20	5.0
	6	2	2	1	2	0	3		10	1.7
	7	3	0	4	4	3	4		18	3.0
	8	2	3	3	0	3	4		15	2.5
	9	2	2	2	1	3	4		14	2.3
	10	3	7	4	3	3	5		25	6.3
									159	3.2
May 1987	1	2	2	0	3	13	7		27	4.5
	2	0	10	7	8	7	5		37	6.2
	3	2	11	6	4	6	6		35	5.8
	4	2	6	9	5	12	3		37	6.2
	5	5	8	4	3	6	6		32	5.3
	6	4	0	2	1	8	4		19	3.2
	7	1	1	0	1	3	0		6	1.0
	8	0	2	2	2	3	3		12	2.0
	9	3	2	3	3	1	0		12	2.0
	10	1	1	3	1	6	4		16	2.7
									233	3.9
May 1986	1	1	3	3	0	3	4	3	17	2.4
	2	4	7	7	5	5	1	3	32	4.6
	3	3	0	1	1	3	4	4	16	2.3
	4	2	1	3	1	1	4	2	14	2.0
	5	2	3	3	5	3	4	7	27	3.9
	6	4	4	4	5	2	5	3	27	3.9
	7	1	6	3	6	2	3	1	22	3.1
	8	1	3	3	2	2	0	2	13	1.9
	9	2	2	4	5	1	3	2	19	2.7
	10	1	1	0	3	3	1	3	12	1.7
									199	2.9

3., Table A. continued

SURVEY DATE	TRANSECT NUMBER	DAY							TOTAL	MEAN
		1	2	3	4	5	6	7		
May 1985	1	2	1	4					7	2.3
	2	4	3	2					9	3.0
	3	1	2	3					6	2.0
	4	2	1	1					4	1.3
	5	2	0	1					3	1.0
	6	8	6	7					21	7.0
	7	2	4	3					9	3.0
	8	4	1	1					6	2.0
	9	0	2	2					4	1.3
	10	3	1	4					8	2.7
									77	2.6

Appendix B. continued

Table B. Number of deer observed per mile during aerial surveys of the eastern Stairsteps unit, 1984-91.

Survey	Transect #	Left Observer	Right Observer	Total Deer	Average deer/mile
Pre-hunt	1	0	10	10	1.03
Aug. 1984	2	0	3	3	0.31
	3	1	2	3	0.31
	4	0	2	2	0.21
				18	0.46 (a)
Pre-hunt	1 (55)	0	1	1	0.16
Aug. 1985	2	3	2	5	0.81
	3	0	2	2	0.27
	4	6	9	15	1.72
	5	3	0	3	0.30
	6	1	4	5	0.51
	7	4	2	6	0.54
	8 (62)	1	3	4	0.36
				41	0.64 (b)
Post-hunt	1 (55)	0	0	0	0.00
Feb. 1986	2	0	1	1	0.16
	3	2	1	3	0.40
	4	4	4	8	0.92
	5	2	2	4	0.40
	6	2	3	5	0.51
	7	0	0	0	0.00
	8 (62)	1	2	3	0.27
				24	0.38 (c)
Pre-hunt	1 (55)	0	0	0	0.00
Aug. 1986	2	0	1	1	0.16
(1 of 2)	3	0	7	7	0.95
	4	2	5	7	0.80
	5	2	0	2	0.20
	6	2	0	2	0.20
	7	0	3	3	0.27
	8 (62)	3	3	6	0.54
				28	0.44 (d)

Appendix B., Table B. continued

Survey	Transect #	Left Observer	Right Observer	Total Deer	Average deer/mile
Pre-hunt Aug. 1986	1 (55)	0	1	1	0.16
	2	2	0	2	0.32
	4	7	9	16	1.83
	5	0	3	3	0.30
	6	0	2	2	0.20
	7	1	1	2	0.18
	8 (62)	3	4	7	0.63
				33	0.52 (e)
Post-hunt Feb. 1987	1 (55)	0	0	0	0.00
	2	0	0	0	0.00
	3	0	0	0	0.00
	4	4	3	7	0.80
	5	4	0	4	0.40
	6	3	2	5	0.51
	7	3	0	3	0.27
	8 (62)	6	0	6	0.54
				25	0.39 (f)
Annual May, 1987 (1 of 2)	1 (55)	0	0	0	0.00
	2	2	0	2	0.32
	3	0	0	0	0.00
	4	0	1	1	0.11
	5	0	0	0	0.00
	6	0	0	0	0.00
	7	0	0	0	0.00
	8 (62)	0	1	1	0.09
				4	0.06 (g)
Annual May, 1987 (2 of 2)	1 (55)	0	0	0	0.00
	2	0	0	0	0.00
	3	0	0	0	0.00
	4	1	0	1	0.11
	5	0	0	0	0.00
	6	1	0	1	0.10
	7	0	0	0	0.00
	8 (62)	0	0	0	0.00
				2	0.03 (h)

Appendix B., Table B. continued

Survey	Transect #	Left Observer	Right Observer	Total Deer	Average deer/mile
Annual May 1988	1 (55)	0	1	1	0.22
	2	3	0	3	0.42
	3	0	0	0	0.00
	4	8	4	12	1.45
	5	3	2	5	0.59
	6	4	0	4	0.41
	7	10	4	14	1.35
	8 (62)	6	6	12	1.16
				51	0.77 (i)
Annual June 1989	1 (55)	0	9	9	1.96
	2	5	0	5	0.70
	3	2	3	5	0.67
	4	9	13	22	2.66
	5	3	2	5	0.59
	6	0	2	2	0.20
	7	2	0	2	0.19
	8 (62)	10	4	14	1.35
				64	0.96 (j)
Annual June 1990	1 (55)	1	0	1	0.20
	2	3	0	3	0.41
	3	0	3	3	0.38
	4	6	4	10	1.24
	5	0	3	3	0.37
	6	2	1	3	0.32
	7	0	0	0	0.00
	8 (62)	0	0	0	0.00
				23	0.35 (k)
Annual June 1991 (1 of 2)	1 (55)	0	2	2	0.40
	2	2	1	3	0.41
	3	0	0	0	0.00
	4	4	6	10	1.24
	5	0	1	1	0.12
	6	2	3	5	0.54
	7	1	0	1	0.10
	8 (62)	3	4	7	0.71
				29	0.44 (l)

Appendix B., Table B. continued

Survey	Transect #	Left Observer	Right Observer	Total Deer	Average deer/mile
Annual	1 (55)	0	0	0	0.00
June 1991	2	0	1	1	0.14
(2 of 2)	3	1	1	2	0.26
	4	6	2	8	0.99
	5	0	1	1	0.12
	6	5	2	7	0.75
	7	2	3	5	0.51
	8 (62)	3	2	5	0.51
				29	0.44 (1)

(a) Density estimates based on 5.7% area coverage:

1. 100% of animals observed: $.46 \text{ deer}/72.7 \text{ acres} \times 1/1.00 = 1 \text{ deer}/158 \text{ acres.}$
2. 50% of animals observed: $.46 \text{ deer}/72.7 \text{ acres} \times 1/.50 = 1 \text{ deer}/79 \text{ acres.}$
3. 40% of animals observed: $.46 \text{ deer}/72.7 \text{ acres} \times 1/.40 = 1 \text{ deer}/63 \text{ acres.}$

(b) Density estimates based on 10% area coverage:

1. 100% of animals observed: $.64 \text{ deer}/79.3 \text{ acres} \times 1/1.00 = 1 \text{ deer}/124 \text{ acres.}$
2. 50% of animals observed: $.64 \text{ deer}/79.3 \text{ acres} \times 1/.50 = 1 \text{ deer}/62 \text{ acres.}$
3. 40% of animals observed: $.64 \text{ deer}/79.3 \text{ acres} \times 1/.40 = 1 \text{ deer}/50 \text{ acres.}$

(c) Density estimates based on 10% area coverage:

1. 100% of animals observed: $.38 \text{ deer}/79.3 \text{ acres} \times 1/1.00 = 1 \text{ deer}/209 \text{ acres.}$
2. 50% of animals observed: $.38 \text{ deer}/79.3 \text{ acres} \times 1/.50 = 1 \text{ deer}/104 \text{ acres.}$
3. 40% of animals observed: $.38 \text{ deer}/79.3 \text{ acres} \times 1/.40 = 1 \text{ deer}/83 \text{ acres.}$

(d) Density estimates based on 10% area coverage:

1. 100% of animals observed: $.44 \text{ deer}/79.3 \text{ acres} \times 1/1.00 = 1 \text{ deer}/180 \text{ acres.}$
2. 50% of animals observed: $.44 \text{ deer}/79.3 \text{ acres} \times 1/.50 = 1 \text{ deer}/90 \text{ acres.}$
3. 40% of animals observed: $.44 \text{ deer}/79.3 \text{ acres} \times 1/.40 = 1 \text{ deer}/72 \text{ acres.}$

Appendix B., Table B. continued

(e) Density estimates based on 10% area coverage:

1. 100% of animals observed: $.52 \text{ deer}/79.3 \text{ acres} \times 1/1.00 =$
1 deer/152 acres.
2. 50% of animals observed: $.52 \text{ deer}/79.3 \text{ acres} \times 1/.50 =$
1 deer/76 acres.
3. 40% of animals observed: $.72 \text{ deer}/79.3 \text{ acres} \times 1/.40 =$
1 deer/61 acres.

(f) Density estimates based on 10% area coverage:

1. 100% of animals observed: $.39 \text{ deer}/79.3 \text{ acres} \times 1/1.00 =$
1 deer/200 acres.
2. 50% of animals observed: $.39 \text{ deer}/79.3 \text{ acres} \times 1/.50 =$
1 deer/100 acres.
3. 40% of animals observed: $.39 \text{ deer}/79.3 \text{ acres} \times 1/.40 =$
1 deer/80 acres.

(g) Density estimates based on 10% area coverage:

1. 100% of animals observed: $0.06 \text{ deer}/79.3 \text{ acres} \times 1/1.00 =$
1 deer/1,322 acres.
2. 50% of animals observed: $.06 \text{ deer}/79.3 \text{ acres} \times 1/.50 =$
1 deer/661 acres.
3. 40% of animals observed: $.06 \text{ deer}/79.3 \text{ acres} \times 1/.40 =$
1 deer/529 acres.

(h) Density estimates based on 10% area coverage:

1. 100% of animals observed: $0.03 \text{ deer}/79.3 \text{ acres} \times 1/1.00 =$
1 deer/2,643 acres.
2. 50% of animals observed: $0.03 \text{ deer}/79.3 \text{ acres} \times 1/.50 =$
1 deer/1,322 acres.
3. 40% of animals observed: $0.03 \text{ deer}/79.3 \text{ acres} \times 1/.40 =$
1 deer/1,057 acres.

(i) Density estimates based on 10% area coverage:

1. 100% of animals observed: $0.77 \text{ deer}/79.3 \text{ acres} \times 1/1.00 =$
1 deer/103 acres.
2. 50% of animals observed: $0.77 \text{ deer}/79.3 \text{ acres} \times 1/.50 =$
1 deer/51 acres.
3. 40% of animals observed: $0.77 \text{ deer}/79.3 \text{ acres} \times 1/.40 =$
1 deer/41 acres.

(j) Density estimates based on 10% area coverage:

1. 100% of animals observed: $0.96 \text{ deer}/79.3 \text{ acres} \times 1/1.00 =$
1 deer/83 acres.
2. 50% of animals observed: $0.96 \text{ deer}/79.3 \text{ acres} \times 1/.50 =$
1 deer/41 acres.
3. 40% of animals observed: $0.96 \text{ deer}/79.3 \text{ acres} \times 1/.40 =$
1 deer/33 acres.

Appendix C. Summary of vehicle surveys conducted on the Big Cypress National Preserve during selected hunting seasons, 1983-92.

	Vehicles Only									ATC								
	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
ARCHERY																		
Opening weekend	52 a	141	90	91	140	109	109	99	131	41 a	56	21	6	2	4	6	6	9
1st week	41 a	74	60	42	58	100	49	71	48	18 a	18	4	3	2	2	0	5	10
2nd week	63 a	61	45	58	52	80	54	43	71	26 a	36	2	8	2	1	1	4	7
3rd week	36 a	79	56	56	49	67	64	53	32	22 a	29	9	3	6	4	0	6	12
4th week	--	--	--	--	--	--	--	51	31	--	--	-	-	-	-	-	3	8
MUZZLELOADING																		
Opening weekend	196	179	111 d	155	104	178	137	133	137	85	54	10 d	6	1	2	4	10	17
1st week	75 b	121	71	110	81	150	68	74	90 f	12 b	48	9	3	0	6	2	6	20 f
2nd week	82 b	97	81	103	90	141	78	82	69	28 b	31	7	6	0	4	1	5	15
GENERAL GUN																		
Opening weekend	367	406	348	371	389	422	373	285	300	142	134	41	34	11	34	14	14	60
Midweek	112	53	49	---	---	---	---	---	---	24	28	12	--	--	--	--	--	--
1st week	204 b	242	179	224	208	235	176	244	165 f	98 b	66	33	18	4	15	17	19	27 f
2nd week	272 a	307	171	152	139	289	220	98	168 f	90 a	96	10	6	0	9	13	6	41 f
3rd week	172	206	250	210	181	190	227	204	110 f	84	69	17	21	2	7	8	11	39 f
4th week	103 a	225	137	141	114	306	369	217	109 f	55 a	63	10	4	2	19	24	53	25 f
5th week	104 a	177	105	126	125	190	242	204	93 f	33 a	52	9	3	4	3	5	9	18 f
6th week	81	138	78	115	126	194	218	200	141 f	13	55	4	6	8	3	9	11	29 f
7th week	88 a	245	167	182	138	179	194	145	-- e	24 a	89	7	5	2	7	6	14	-- e
8th week	231	338	249	247	234	92	147	---	---	109	79	10	7	0	16	3	--	--

Appendix C. continued

	Swamp Buggy										Airboat									
	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92		83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	

ARCHERY																				
Opening weekend	22 a	32	38	32	53	45	63	51	58		10 a	4	5	2 c	12 c	15 c	32 c	2 c	7	
1st week	14 a	19	18	11	29	33	28	34	24		8 a	7	12	4 c	0 c	9 c	17 c	8 c	2	
2nd week	24 a	13	21	17	16	37	44	33	31		0 a	6	4	17 c	19 c	25 c	29 c	7 c	2	
3rd week	11 a	23	29	28	26	34	48	24	20		7 a	10	0	15 c	0 c	5 c	15 c	8 c	8	
4th week	--	--	--	--	--	--	--	24	22		-	--	-	--	-	-	--	4 c	0	

MUZZLELOADING																				
Opening weekend	84	87	39 d	73	71	100	104	65	70		26	19	9 d	7 c	15 c	13 c	23 c	6 c	8	
1st week	17 b	53	55	48	54	67	69	48	81 f		10 b	12	7	6 c	28 c	31 c	17 c	13 c	9 f	
2nd week	41 b	43	38	42	61	64	50	33	41		26 b	9	7	6 c	8 c	47 c	40 c	4 c	5	

GENERAL GUN																				
Opening weekend	164	219	157	165	191	246	174	143	116		140	140	128	114 c	146 c	227 c	222 c	82 c	101	
Midweek	60	61	61	---	---	---	---	---	---		50	24 c	29 c	--	--	--	---	-	--	
1st week	60 b	94	91	107	132	96	125	97	67 f		39 b	57	32	50 c	74 c	89 c	103 c	8 c	55 f	
2nd week	96 a	87	60	58	80	124	114	42	86 f		5 a	30	21	29 c	36 c	55 c	44 c	0 c	34 f	
3rd week	65	64	110	79	121	60	89	63	75 f		31	26	2	32 c	46 c	44 c	37 c	0 c	26 f	
4th week	56 a	68	49	60	75	122	180	69	56 f		22 a	31	16	18 c	35 c	41 c	103 c	0 c	18 f	
5th week	31 a	59	50	56	67	69	107	61	42 f		24 a	7	11	12 c	21 c	53 c	57 c	6 c	36 f	
6th week	19	43	45	53	53	103	97	68	78 f		9	15	10	17 c	28 c	31 c	18 c	0 c	28 f	
7th week	36 a	93	67	74	62	107	82	31	-- e		10 a	16	18	31 c	36 c	38 c	26 c	0 c	-- e	
8th week	112	93	92	102	84	53	50	--	--		46	33	12	56 c	62 c	20 c	11 c	-	--	

Appendix C. continued

Totals								
83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92

125 a	212	154	131	207	173	210	158	205
81 a	118	94	60	89	144	94	118	84
113 a	116	72	100	89	143	128	87	111
76 a	141	94	102	81	110	127	91	72
--	---	--	---	--	---	---	82	61
391	339	169 d	241	191	293	268	214	232
114 b	234	142	167	163	254	156	141	200 f
177 b	180	133	157	159	256	169	124	130
813	899	674	684	737	895	783	524	577
246	166	151	---	---	---	---	---	---
401 b	459	335	399	418	435	421	368	314 f
463 a	520	262	245	255	477	391	146	329 f
352	365	379	342	350	301	361	278	250 f
236 a	387	212	223	226	488	676	339	208 f
192 a	295	175	197	217	315	411	280	189 f
122	251	137	191	215	331	342	279	276 f
158 a	443	259	292	238	331	308	190	--- e
498	543	363	412	380	181	211	---	---

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- a) Excluding Loop Road, Pinecrest to Monroe Station; and/or County Roads 837 and 841; and/or U.S. 41, TRR to west boundary; and/or Loop Road, 40 Mile Bend to Pinecrest.
- b) Excluding several locations.
- c) Includes Mitchell's Landing.
- d) Main campground (Bear Island) not counted.
- e) No vehicle count- check in/out forms used to determine pressure.
- f) Excludes 31 MM at Alligator alley.
- All: Excluded S-12's, S-12A and Bear Island - other Sites.