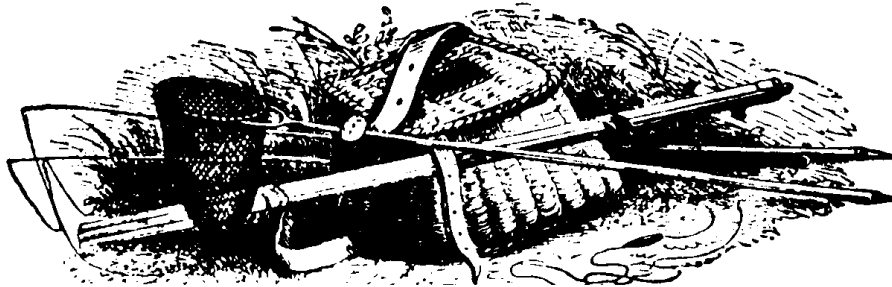
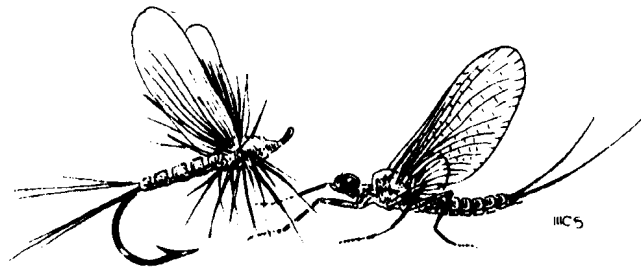
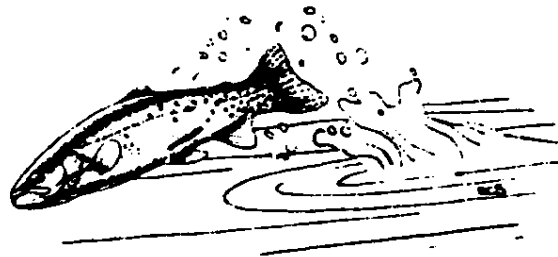


Great Smoky Mountains National Park

1999 Fisheries Management Report



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Introduction

Great Smoky Mountains National Park (GRSM) encompasses over 558,000 acres of Federally protected mountains, which are estimated to be 200-300 million years old. The Park is home to diverse populations of plants, insects, and animals due to variety of forest types, soil types, geological formations, disturbance histories, and elevational changes (1,000 to over 6,000 feet).

The Park has over 2,000 miles of streams, roughly 800 miles of which are thought to contain fishable populations of trout. The Park is home to roughly 53 species of fish. Three of these species, the Smoky madtom, yellowfin madtom, and spotfin chub, are federally threatened or endangered and thus protected in GRSM. Two other species, the flame chub and the duskytail darter, are considered species of special concern.

The brook trout is the only salmonid (i.e. trout/salmon) species endemic to the Park. Brook, brown and rainbow trout were introduced into GRSM by logging companies during the early 1900's to replace trout populations decimated by their logging activities. Stocking of brook, brown, and rainbow trout by the NPS continued until 1975, when Park managers realized that stocking these exotics did not conform to NPS mandates to protect and preserve native species. Today rainbow trout are found in almost every watershed in the Park, brown trout are found in roughly half, and non-native brook trout in about a third of the Park's watersheds.

The purpose of this report is to: (1) inform and educate GRSM staff and resource users about GRSM fisheries management projects and activities, (2) present 1999 sampling locations and results, (3) present 1999 ranger creel results, and (4) describe upcoming projects.

The GRSM Fisheries Program

The mandates of the National Park Service focus on the protection and preservation of its natural resources so as to leave them unimpaired for future generations. To address these mandates, the fisheries program is designed to establish baseline information on water quality and fish populations through

inventory and monitoring (I&M) stations. Baseline information is used to define changes in aquatic systems due to natural and human-induced occurrences. Also, baseline information is vital in making management decisions concerning Park resources.

It is impossible to annually collect and monitor information from every stream in the Park. Therefore, key watersheds are selected throughout the Park which best represent the various disturbance histories (settlement, undisturbed), forest types (second growth, old growth), geology's (sandstone, anakeesta, limestone), and elevational gradients. Information is collected from eight different types of sites: (1) large stream I&M sites, (2) brook trout I&M sites, (3) brook trout restoration I&M sites, (4) brook trout distribution I&M sites, (5) acid deposition I&M sites, (6) mark-n-move sites, (7) general I&M site, and (8) crew training sites.

Large Stream I&M Sites - These sites monitor the diverse gamefish (bass and trout) and non-gamefish (minnows, dace, shiners, suckers, etc.) communities in some of the Park's larger river systems. Many of these species are more sensitive to acid deposition effects than trout and are therefore excellent indicators of severe changes in Park waters.

Brook Trout I&M Sites - Annually, 25-30 monitoring sites, typically at high elevations (>3,000 feet), are sampled throughout the Park to monitor brook and brook/rainbow trout populations. These sites are useful in determining changes in brook trout populations due to competition from rainbow trout, acid rain, or natural occurrences.

Brook Trout Restoration I&M Site - These sites are established and monitored annually after the stream is restored to brook trout to ensure that all rainbow trout have been removed from the system.

Brook Trout Distribution I&M Sites - A few of these sites are established in each watershed during brook trout distribution surveys in order to get brook trout population data at that point in time. These sites are then re-visited every 10 years to assess gains/losses in brook trout populations due to acid rain, rainbow trout competition, or other disturbances.

Acid Deposition I&M Sites - A couple streams in the Park have been known to contain trout populations in the past 60-80 years, but today support only small populations or are devoid of fish. The probable causes of these depressed or lost populations are effects associated with acidic deposition. These sites monitor water quality and fish populations to determine the magnitude of acid deposition effects.

Mark-N-Move Sites - When possible fish barriers (i.e. natural waterfalls and cascades) are located on streams which once contained brook trout, an opportunity arises to test the barrier for possible brook trout reintroduction. To do so, rainbow trout are collected from above the possible barrier, marked (usually by removing their adipose fin) and then moved below the barrier and

released. Crews return one year later to sample above the barrier to see if any fish made it up and over the structure. If no marked fish are present, it is assumed to be a good barrier possible of brook trout restoration in the future.

[General I&M Sites](#) - During some years, special projects, such as road or bridge construction, make it necessary to establish baseline water quality and fish information, before and after construction, to ensure the construction practices do not cause serious damage to Park resources. After completion, if there are no significant changes, these sites are dropped from annual monitoring.

[Crew Training Sites](#) - These sites are used every year to train new crewmembers in the use of backpack electrofishing gear and stream sampling techniques.

Sites Completed In 1999

Crews completed 112 stream surveys in 33 streams and 13 watersheds during 1999. The streams and number of sites sampled are found in Table 1. In addition, brook trout distribution surveys were completed in the Cataloochee Creek watershed. Additional brook trout distribution surveys were begun in the Big Creek watershed.

Sampling Results

Brook Trout Monitoring

Brook trout monitoring sites were located between 543 and 1,482m (1,780 to 4,860 feet) in elevation in 1st to 4th order streams. Water temperature ranged from 11.0 to 19.6°C and stream discharge ranged from 0.008 to 0.34m³/sec (0.3 to 12.1 ft³/sec). Stream pH ranged from 5.3 to 6.9, conductivity from 5 to 18 Mhos/cm, and stream gradient from 3.4 to 13.3%.

Brook trout density ranged from 2.0 to 50.1 fish/100m². Young-of-the-year (YOY)(age-0 fish) brook trout comprised 25-71% of allopatric (i.e. brook trout were the only salmonid found there) populations. Typical allopatric brook trout populations produce 25-75% of the population each year in offspring (YOY). The only exception to this rule has been during years of large floods such as in 1994. However, Rock Creek (Cosby watershed) has only produced good year classes (25-75% of the population) in 1993 and 1995 indicating other factors besides major floods may be driving this population.

Table 1. - Streams sampled during 1999 fishery monitoring surveys in Great Smoky Mountains National Park.

Ranger	Stream	# of	Watershed	Site
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District	Name	Sites	Name	Type
Cades Cove	Abrams Creek	4	Abrams Creek	Large Stream I&M
Cades Cove	Anthony Creek	1	Abrams Creek	Large Stream I&M
Cades Cove	Mill Creek	2	Abrams Creek	Large Stream I&M
East District	Beech Creek	2	Cataloochee Creek	Brook Trout Restoration
East District	Cataloochee Creek	4	Cataloochee Creek	Large Stream I&M
East District	Little Cataloochee	6	Cataloochee Creek	Brook Trout Restoration
East District	Lost Bottom	4	Cataloochee Creek	Brook Trout Restoration
East District	Winding Stair	4	Cataloochee Creek	Mark-N-Move
East District	Cosby Creek	2	Cosby Creek	Brook Trout I&M
East District	Rock Creek	3	Cosby Creek	Brook Trout I&M
East District	Indian Camp Creek	3	Indian Camp Creek	Brook Trout I&M
East District	Cannon Creek	2	MP Little Pigeon	Acid Deposition I&M
Lake District	Ekaneetlee Creek	4	Eagle Creek	Brook Trout Restoration
Lake District	Walkers Creek	1	Hazel Creek	Brook Trout I&M
Lake District	Hazel Creek	2	Hazel Creek	Large Stream I&M
Lake District	Hazel Creek	3	Hazel Creek	Brook Trout I&M
Little River	Blanket Creek	3	EP Little River	Brook Trout Restoration
Little River	Mannis Branch	3	EP Little River	Brook Trout Restoration
Little River	Ash Camp Branch	3	EP Little River	Mark-N-Move
Little River	Fish Camp Prong	2	EP Little River	Mark-N-Move
Little River	Silers Creek	3	EP Little River	Brook Trout I&M
Little River	Laurel Branch	1	EP Little River	Fisheries Crew Training
Little River	Little River	4	Little River	Large Stream I&M
Little River	Sams Creek	4	MP Little River	Brook Trout I&M
Little River	Starkey Creek	2	MP Little River	Brook Trout I&M
Little River	Leconte Creek	27	WP Little Pigeon	Brook Trout Restoration
Little River	Road Prong	2	WP Little Pigeon	Brook Trout I&M
Little River	Roaring Fork	2	WP Little Pigeon	General I&M
Little River	Walker Prong	2	WP Little Pigeon	Brook Trout I&M
Little River	WP Little Pigeon	1	WP Little Pigeon	General I&M
Oconaluftee	Bunches Creek	3	Bunches Creek	Brook Trout I&M
Oconaluftee	Flat Creek	1	Bunches Creek	Brook Trout I&M
Oconaluftee	Straight Fork	2	Straight Fork	General I&M

Density and biomass comparisons among streams indicate substantial variation in the number of trout per mile of stream. Allopatric brook trout biomass averaged 29.5 kg/ha and ranged from 6-72 kg/ha. Sympatric brook and rainbow trout biomass averaged 25.5 kg/ha and ranged from 6.8 to 62.4 kg/ha. The number of brook trout per mile of stream ranged from 224-3,136 fish/mile, however, most streams average 600-1,800 brook trout/mile. *For a detailed breakdown of fish sizes, numbers collected, and numbers per mile of stream, please refer to Appendix Table 2.*

In several sympatric streams (i.e. where brook and rainbow trout were mixed), there appears to be some minor population changes occurring. One example is Beech Creek, which indicates brook trout populations have significantly increased from 1997 to 1999 (Figure 1). Data indicates brook trout

may be reclaiming some of their native range back from exotic rainbow trout in these mixed areas.

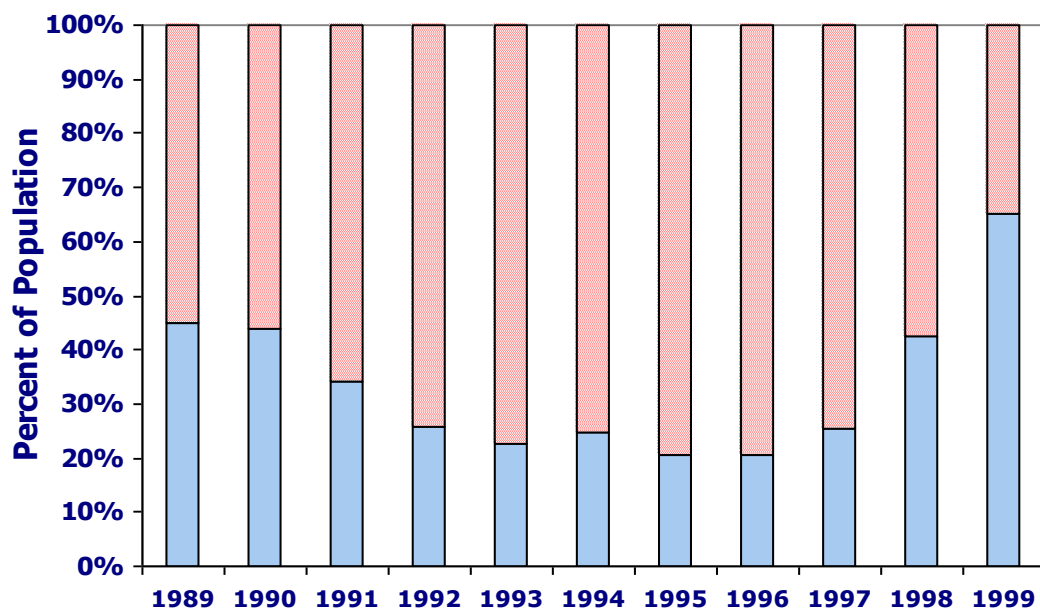


Figure 1. - Composition of brook and rainbow trout in Beech Creek, Great Smoky Mountains National Park, over an 11 year period. Brook trout are shown in blue while rainbow trout are in red.

Data indicates that in most sympatric (mixed brook and rainbow trout) populations in the Park, rainbow trout encroachment is not a systematic process, and that many populations have reached an equilibrium or may be reclaiming their lost range. These sympatric populations seem to follow an ebb and flow scenario from year to year. Typically, brook trout populations significantly decline only in years of major storm events between November and March, while rainbow trout typically decline in years with major storm events between February and May.

Data collected in 1999 indicates that brook and rainbow trout populations in Starkey Creek have not recovered since a spring 1994 flood in the watershed (Figure 2). Coincidentally, brook and rainbow trout populations in Sams Creek, a stream just across the ridge from Starkey Creek, have rebounded well from the 1994 flood. These data suggest that underlying anakeesta formations on Starkey Creek, exposed further after the 1994 flood, may be retarding the re-population of Starkey Creek. Cannon Creek, a stream in Middle Prong of the

Little Pigeon River, whose headwaters are underlain by small amounts of exposed anakeesta, indicates a similar lack of recovery following the 1994

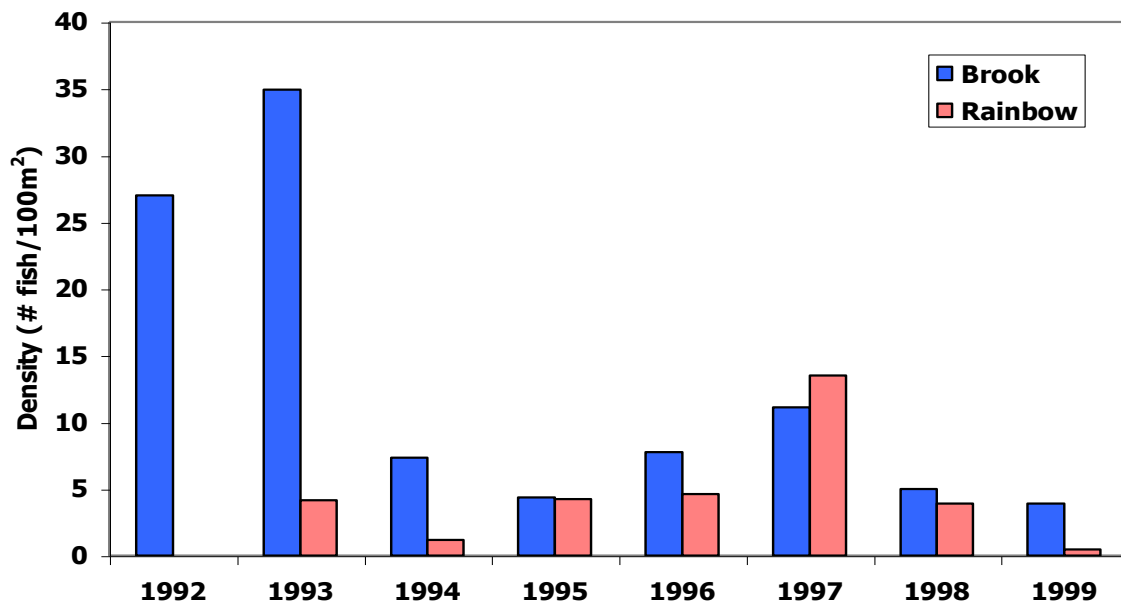


Figure 2. - Brook and rainbow trout density in Starkey Creek, Great Smoky Mountains National Park, between 1992 and 1999.

floods. Populations in both streams follow a pattern similar to other Park streams that are prone to acidification. As forests age and acid deposition increases in GRSM, streams underlain by anakeesta slowly lose their buffering capacity and become more susceptible to severe rain events. These severe rain events can cause the drastic reductions in trout populations observed in Cannon and Starkey Creek. Adult brook trout in GRSM rarely live beyond 4 years of age and seldom exceed 200mm (8 inches) in length. In 1999, brook trout monitoring surveys collected 1,631 brook trout of which, 64 (<4%) were greater than 7 inches. In any given year, <5% of all brook trout collected are greater than 178mm or 7 inches.

Collections of brook trout throughout the eastern United States indicate that the brook trout found in GRSM are a distinct sub-species of brook trout. The taxonomic break appears to be the New River watershed in Virginia. Of the 51 populations studied throughout GRSM, roughly 69% are pure southern Appalachian strain brook trout. Hybrid strain populations account for 29%, and

northern strain populations, 2%. Only pure southern Appalachian strain brook trout are used for reintroduction projects.

Brook Trout Distribution

Brook and rainbow trout distribution surveys were completed in the Cataloochee Creek watershed in 1999. Results of the 1999 survey were compared to brook and rainbow trout distribution data collected by Willis King in 1936-1937 to assess change over the 60-year period. Distributions of brook and rainbow trout were assessed in fifteen streams common to both surveys. Sympatric (mixed) rainbow and brook trout populations were identified and compared in six of the fifteen streams, while all fifteen included comparisons of allopatric brook trout populations.

Between the 1930's and today, rainbow trout invaded and expanded their range in the lower end of streams throughout the Cataloochee watershed. Rainbow trout invaded 0.6-3.2 km (0.4-2.0 miles) of stream throughout the watershed. In the Little Cataloochee portion of the watershed, rainbow trout invaded 1.6 km (1.0 mile) of the lower ends of both Woody and Andy Branch. Rainbow trout invaded about 1.9 km (1.2 mile) of Pretty Hollow and about 1.6-3.2 km (1.0-2.0 miles) of the Palmer Creek area. Rainbow trout invaded about 0.6-1.6 km (0.4-1.0 miles) of the lower end of the Rough Creek area and the lower 2.4km (1.5 miles) of the Caldwell Fork portion of Cataloochee watershed. In Cooks Creek, rainbow trout invaded the entire allopatric portion of the stream. Rainbow trout invaded five streams that were void of rainbow trout in the 1930's survey.

It is difficult to assess allopatric brook trout zones over the 60-year period because the upper ranges were not all determined in the 1930's. There were no streams in the Cataloochee watershed in which rainbow trout completely displaced brook trout. Range loss that did occur in most of the allopatric brook trout zones is due to rainbow trout encroachment. A total of 17.4km (10.9 miles) of allopatric zone was lost in eleven streams due to rainbow trout encroachment. Brook trout lost 0.6–3.2 km (0.4-2.0 miles) of allopatric range per stream to

rainbow trout over the last 60 years. In most streams, this means pure brook trout are found 49-168m (160 to 550 feet) higher in elevation than they were 60 years ago. Natural barriers only protected four allopatric brook trout populations from rainbow trout migration.

Big Creek watershed is selected for trout distribution surveys in 2000. The Gunter Fork and Swallow Fork arms of Big Creek were surveyed in 1999. These data will be analyzed when the remaining Big Creek watershed distribution survey is completed in 2000.

Brook Trout Restoration

Mannis Branch

Fisheries crews revisited Mannis Branch in June 1999 to evaluate the brook trout population, which was reintroduced in 1996 following rainbow trout removal. Young-of-year brook trout comprised 37-63% of the population indicating good reproduction. Brook trout are still acclimating to the stream however, the population should approach pretreatment levels once the population is acclimated. Data collected in 1999 suggests the brook trout are at 75% of pretreatment biomass levels (Figure 3).

LeConte Creek

The LeConte-Pilkey Creek restoration project completed its second field season in 1999. Four electrofishing removals were completed on LeConte Creek in 1998 while two final removals were completed in 1999. A total of 584 rainbow trout were removed and placed in another stream or below a milldam located at the lower end of site #1. On the first removal 495 (85%) rainbow trout were extracted, 61 (10%) on the second, 21 (4%) on the third, and 7 (1%) on the fourth removal. Out of the 495 fish on the first removal, 12% (59) were YOY rainbow trout and 88% (436) were adult. On the second removal, 41% (25) were

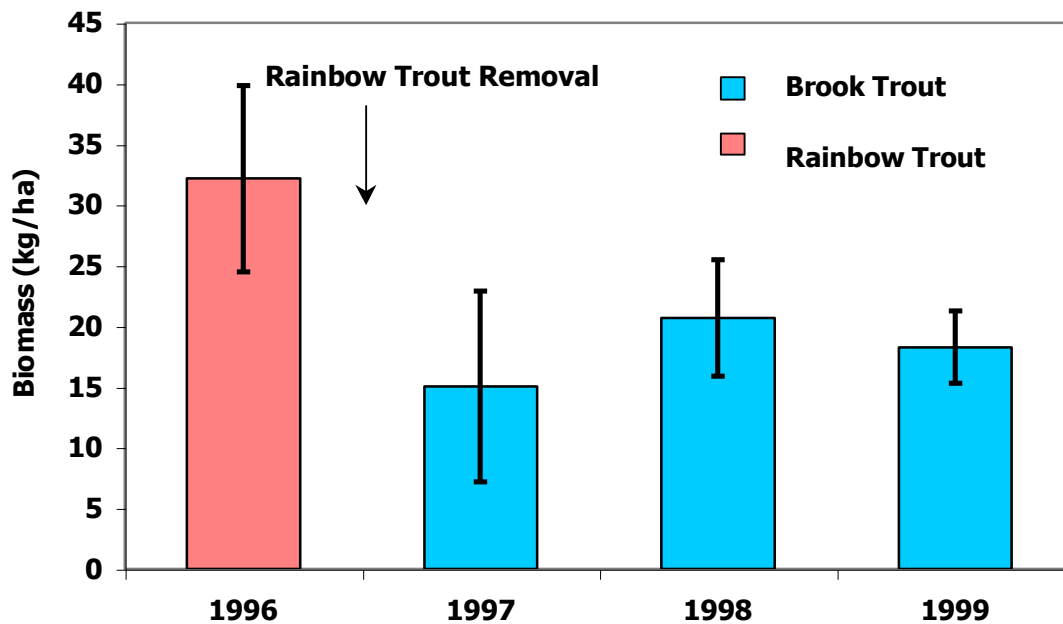


Figure 3. Rainbow and brook trout biomass (SE) before and after rainbow trout removal efforts on Mannis Branch, GRSM.

YOY and 60% (36) were adult trout. Low flows during the 1998 season allowed a higher capture and removal rate of the non-native rainbow trout. Therefore, only 28 were collected during the third and fourth removals and they were all adult. The goal of eliminating rainbow trout reproduction during the first year of the project was achieved.

All rainbow trout that were taken out of the treatment section (upstream of the milldam) and placed below the milldam had a clipped adipose fin. Five fin-clipped rainbow trout were collected above the milldam during the third and fourth removals indicating that the milldam was ineffective at stopping rainbow trout migration. Several possible breeches were recognized on the milldam and steps were taken to fix these areas. Strategic placement of boulders and logs to re-route water at the dam has stopped rainbow trout migration over the milldam.

No adverse effects were noted on the non-target fish species during the four removals. Longnose dace (*Rhinichthys cataractae*) numbers remained constant from the first to the fourth removal (13) while blacknose dace (*Rhinichthys atratulus*) numbers actually increased (241-271).

Using backpack electrofishing techniques, Southern Appalachian strain brook trout were taken from Cosby Creek watershed and placed into LeConte Creek in September 1999. A total of 320 trout were weighed, measured, and marked with an adipose fin clip. One hundred eleven were taken from Cosby creek, 102 from Greenbrier Creek, and Indian Camp Creek had 103 brook trout removed. TWRA took 5 brook trout for research purposes and 6 fish died during the transport/transfer. A total of 309 brook trout were released into four sections of LeConte Creek, which covered eleven of the 100-meter sample sites.

Pilkey Creek

In August 1998, 177 brook trout were collected from upper Hazel Creek and placed into three sections on Pilkey Creek. Survival and reproduction were assessed on August 9, 1999. About 1500 m of stream was assessed using three-pass and one-pass depletion techniques. Adult brook trout survived well and migrated upstream at least 400 m above where they were initially placed. The presence of YOY brook trout in the first 1000m of stream indicates adult brook trout successfully spawned in the fall of 1998. An estimated 182 brook trout are surviving well in Pilkey Creek. About 60% of the brook trout are YOY and 40% are adult. Based upon data from similar re-introduction projects in the Park, the Pilkey Creek brook trout population should continue to grow and expand.

"Mark-n-Move" Surveys

"Mark-n-Move" surveys consist of three steps: (1) locating a potential fish barrier (i.e. waterfall or cascade); (2) adipose fin clipping (marking) and transferring rainbow trout, located above the barrier, to the stream section below the barrier (moving); (3) re-surveying the site the following two years to note if marked rainbow trout were able to migrate back above the potential fish barrier. If no marked fish are found above the barrier, plans for future restoration are developed.

During the last two field seasons "mark-n-move" surveys were started on Ash Camp Creek, Little Cataloochee Creek, and Ekaneetlee Creek. So far, no marked fish were found above the potential barriers on each of these streams.

Another barrier was located on Ekaneetlee creek about 900m upstream of the test barrier. No rainbow trout were found in the mainstream and tributary streams above the upstream barrier. Therefore, only 900m of stream could potentially be restored before restoration efforts would be complete on this stream. Step 3 (described above) will be completed on Ash Camp Creek and Little Cataloochee Creek in 2000.

Winding Stair Branch, Gunter Fork, and McGinty Creek were initially assessed for “mark-n-move” surveys in 1999. Both McGinty Creek and Gunter Fork are located in the Big Creek Watershed and have no rainbow trout located above their potential barriers. Therefore, no “mark-n-move” surveys were started on these two streams. A mark-n-move survey was initiated in 1999 on Winding Stair Branch, a third order stream located in Cataloochee Creek’s watershed, and will be evaluated and completed in 2000 and 2001.

Large Stream Monitoring

Five of the Parks large stream systems were sampled in 1999: Abrams Creek, Cataloochee Creek, Hazel Creek, Little River, and Straight Fork. These systems provide a snap shot of the diversity of habitat and fish species diversity found across the Park. A comparison of current and historic US Fish and Wildlife Service (USFWS) monitoring data of species composition among these large stream sites has not significantly changed since the early 1970’s. Species richness in GRSM large stream systems indicates excellent habitat and water quality conditions in nearly every stream. Species richness varied among large streams sampled (Figure 4). Elevation and habitat differences of each site account for most of the variability in species present in each site.

Sensitive species such as salmonids and dace showed no significant changes in abundance or condition during 1999. Brown and rainbow trout densities ranged from 1.2-6.2 fish/100m² (9.6-49.6 fish/mile) and 0.6-28.5

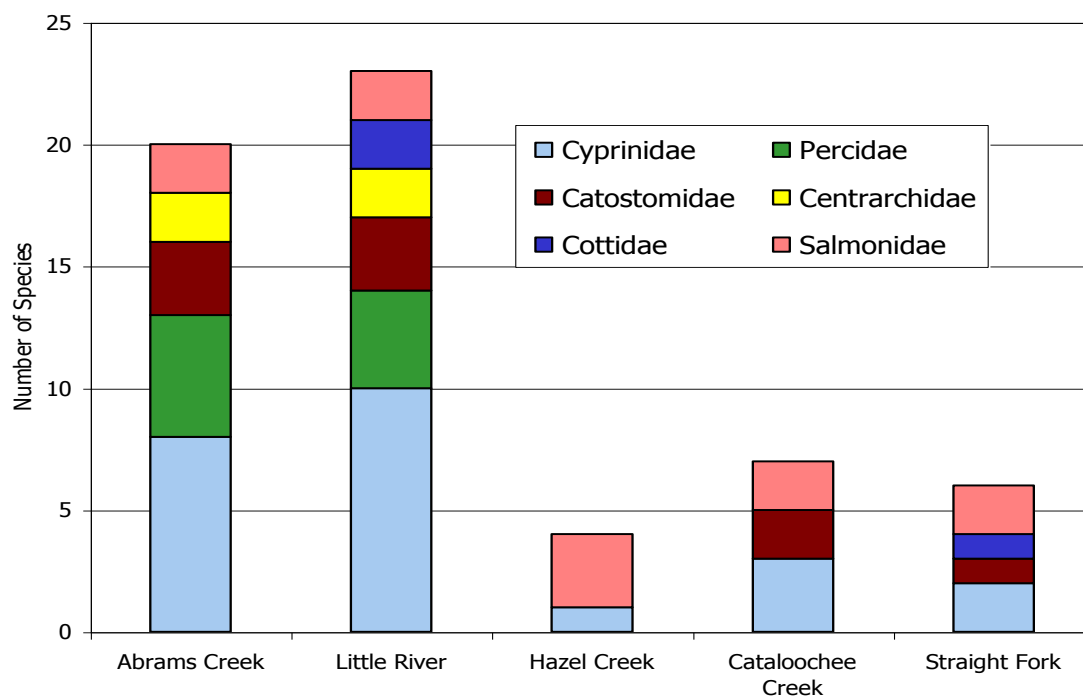


Figure 4. Fish species diversity from various large stream systems sampled in Great Smoky Mountains National Park during 1999. Species represented here only account for species found in the sites sampled during 1999 and do not reflect the entire stream system.

fish/100m² (4.8-228 fish/mile). Young-of-year (YOY) brown and rainbow trout comprised between 22-71% and 50-100% of respective trout species in large stream samples indicating relatively strong year classes of both species during 1999. Annual changes in density and biomass indicate annual variation in these populations is greatly due to abiotic events such as droughts and floods. Young-of-year salmonid production is driven by large flood events (>1000 cfs).

Rainbow trout typically live 3-4 years in the Park, while an occasional 5-year old fish is collected. Historic data indicates annual mortality rates for rainbow trout in GRSM ranges from 60-70% from ages 1-4. Brown trout typically live 5-8 years with an occasional fish living to 12 years of age. Most rainbow trout average 4-10 inches with an occasional fish reaching 14 inches. Most brown trout average 6-14 inches with an occasional fish reaching 25 to 30 inches and 8-10 pounds. *For a detailed breakdown of fish sizes, numbers caught, and numbers per mile of stream, please refer to Appendix Table 2.*

Smallmouth densities declined slightly in site-1 of Abrams Creek during 1999, however rock bass densities slightly increased (Figure 5). Both species demonstrated good reproduction in 1999 indicating that previous habitat limitations have been partially resolved. Sedimentation effects appeared to be

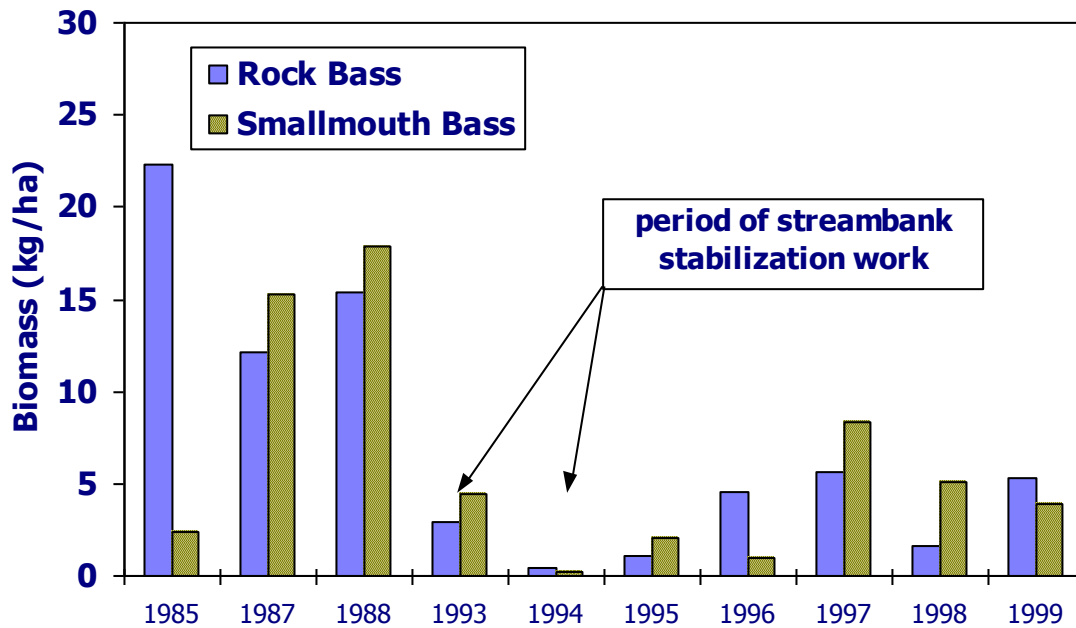


Figure 5. Summary of rock bass and smallmouth bass biomass from Abrams Creek large stream sampling efforts between 1985 and 1999. Samples were not conducted in 1986 and 1989-1992 due to inadequate funding and manpower. This site was added to the annual monitoring scheme in 1993 to assess streambank stabilization and water quality improvement efforts in Cades Cove.

improving over the lower reaches of Abrams Creek and should continue to improve as sediment is flushed out of the system. Data indicate that many of the riffle species (i.e. darters), which live in areas unaffected by sediment inputs, have remained relatively stable throughout the study period.

Non-game species are affected differently by large flood events depending upon the timing and magnitude of the flood and individual life history patterns. An excellent example of these interactions can be demonstrated using Cataloochee Creek. During the severe drought years of 1986 to 1988, stoneroller populations increased dramatically while longnose dace populations declined (Figure 6). After severe floods of 1990 and 1991, longnose dace populations rebounded well while stonerollers began to decline. Between 1994 and 1998, heavy floods resulted in the continued decline of stonerollers while

longnose dace continued to expand. Biologically, seasonably lower water levels and higher water temperatures, typically associated with droughts, tend to favor stonerollers. However, high water levels and cooler water temperatures favor

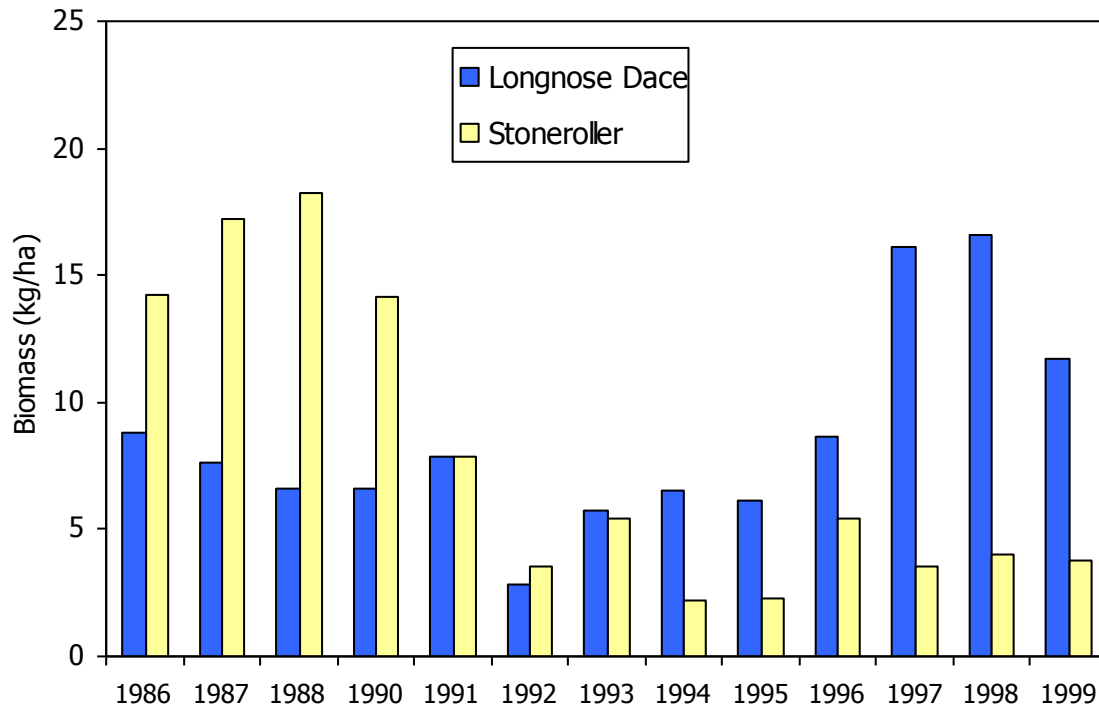


Figure 6. - Longnose dace and stoneroller dynamics on Cataloochee Creek from 1986 to 1998, Great Smoky Mountains National Park. No sample was collected on this site in 1989 due to severe rain events and subsequent high water levels.

longnose dace, which are typically a coldwater species associated with headwater environments. Therefore, the longnose dace and stoneroller dynamics observed between 1986 and 1998, given the water discharge and species biology, are not alarming.

Ranger Creel Reports

Ranger creel reports are an important tool, which helps define angler trends and use patterns throughout the entire Park. Ranger creel reports afford rangers an opportunity to contact anglers and other Park visitors and also generate useful catch and harvest information throughout the Park. Local anglers are designated as those who live within 50 miles of the Park boundary while non-local angler live outside this 50-mile boundary.

Rangers conducted 455 angler creel surveys during 1999 in GRSM (Figure 7) (Appendix Table 3). Interviews declined in 1999, although the distribution of interviews was fairly uniform across the Park. In most districts, local anglers comprised 50-66% of the interviews. However, in the Lake District, local anglers only comprised 19% of the interviews (Appendix 3). There is a

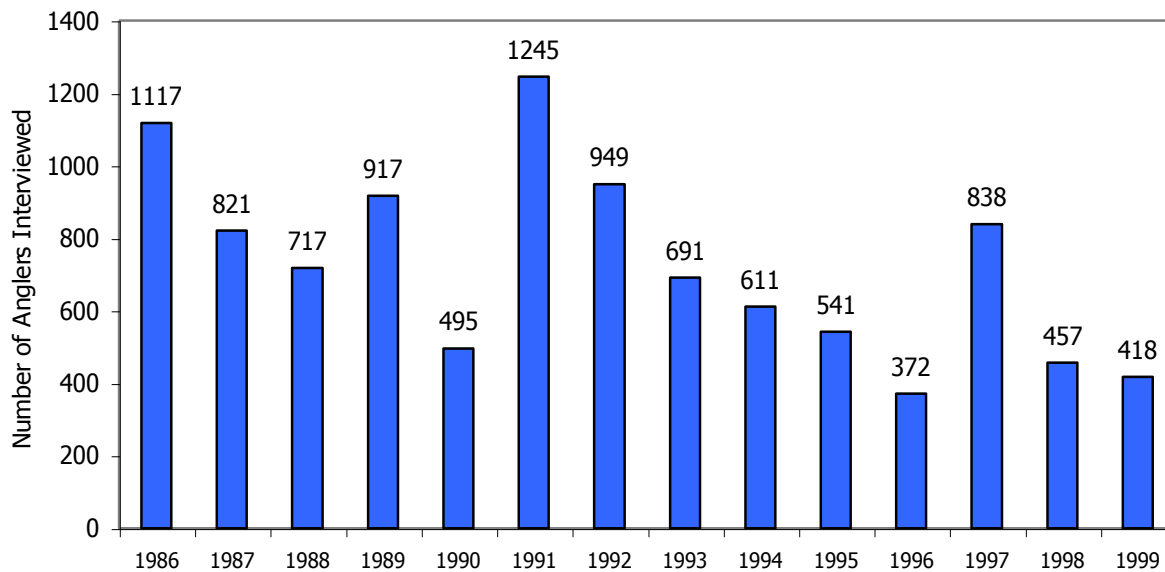


Figure 7. Number of anglers interviewed by GRSM law enforcement rangers during annual ranger creel surveys from 1986 to 1999.

growing number of guide services available to anglers which cater to the park streams entering Fontana lake. Many of these non-local anglers target this area of the park for a remote backcountry fishing experience. Overall, angler trends in 1999 were similar among districts except for the Lake District. In most districts, anglers fished between 1.8-3.7 hours/trip, although trips in the Lake District averaged 3.1-7.0 hours/trip. Typically, local and non-local anglers in the lake district are isolated from other activities and spend most of their days fishing, thus the higher hours.

Parkwide, anglers caught 0.8 to 1.4 fish per hour. Catch rates of local anglers were at least twice those of non-local anglers in every district. Local anglers harvest most of the fish in the Park. In fact, local anglers (18% of the all anglers interviewed) accounted for 74% of the fish harvested Parkwide during 1999. The percent of local anglers who harvest fish was highest in the

Oconaluftee (50%), East (43%) and Lake (56%) districts, indicating a majority of these anglers fish specifically to harvest. Only 27% or less of non-local anglers harvested fish in all districts in 1999.

Angler catch and harvest rates have declined roughly 40% from 1986 to 1999 (Figure 8). With the growing popularity of catch-and-release throughout the US, the declining harvest rates are not surprising. However, the reasons for the declining catch rates Parkwide are unclear. Long-term monitoring data from

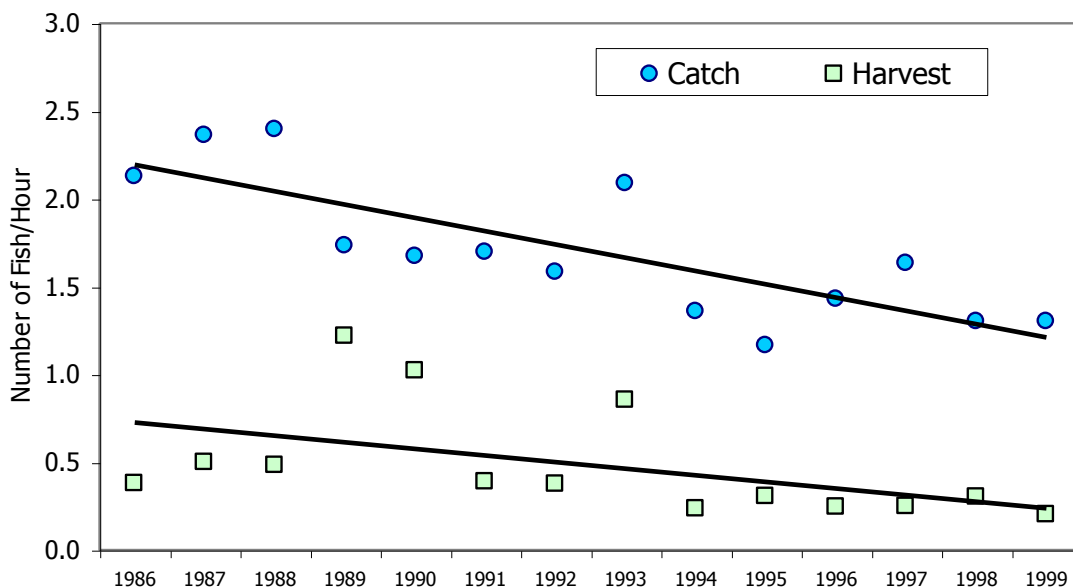


Figure 8. Angler catch and harvest trends from 1986 to 1999 in Great Smoky Mountains National Park. Angler catch and harvest data were collected by law enforcement rangers during normal patrol duties.

numerous sites throughout the Park indicate populations are variable from year to year, but do not show declines similar to angler catch rates. *For a breakdown of Parkwide ranger creel results by ranger district, please see Appendix Table 3.*

Upcoming Projects

Pending a grant, the 2000 fisheries crew will evaluate the “mark-n-move” survey on Winding Stair. This stream is a candidate for brook trout restoration, if the barrier is shown to be effective against rainbow trout re-invasion.

Completion of the LeConte-Pilkey Creek project will be one of the major projects in 2000. Brook trout populations in Pilkey and LeConte Creek will be assessed for survival and reproduction in 2000. Brook trout populations will be checked on LeConte Creek for the first time, while Pilkey Creek will be surveyed for the second year. No more “mark-n-move” surveys will be initiated in 2000 unless a potential barrier is found while determining brook trout distribution on the Big Creek watershed.

Big Creek is the watershed chosen for the 2000 brook trout distribution survey. Brook trout inventories will be conducted on all portions of the watershed and should be complete in 2000. Distribution on part of the watershed has already been accomplished, however, the data will be analyzed when distributions are completed within the entire watershed.

The major project the fisheries department will undertake in 2000 is the Sams Creek brook trout restoration project. This project will entail using a fish toxicant (Antimycin-a) to chemically restore a specific segment of Sams Creek, a portion of middle prong of Little River. Antimycin-a is a toxicant that has been used readily in the western US to restore native cutthroat trout populations in Rocky Mountain and Yellowstone NP and bull trout in Crater Lake NP. The treatment will begin in October 2000 and should be completed in a one-week period.

Appendix