

**FISHERIES REPORT
REPORT NO. 07-03
WARM WATER STREAM FISHERIES REPORT
REGION IV
2006**



Prepared by

Bart D. Carter
Carl E. Williams
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and
James W. Habera



TENNESSEE WILDLIFE

RESOURCES AGENCY

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Cover: A nice catch for a Pigeon River angler. The Pigeon River was one of two rivers where angler use and harvest data were collected during 2006.

Acknowledgements

We would like to thank Pat Black (Nashville Office) for designing and analyzing the creel information collected from the Pigeon and Nolichucky river surveys. We also owe a tremendous amount of gratitude to Richard Markland, Dave Lane, and Rick Hollifield (Erwin Hatchery) for their assistance with 2006 creel surveys. Richard conducted the surveys for the upper Nolichucky section of the creel route.

TABLE OF CONTENTS

	Page
INTRODUCTION	1
METHODS	2
Tennessee River System:	
Little River	9
French Broad River	
Nolichucky River	17
Pigeon River	26
SUMMARY	45
LITERATURE CITED	48
APPENDIX A: Common and scientific names of fishes used in this report	51
APPENDIX B: Analysis tables for angler data collected from the Nolichucky and Pigeon rivers during 2006.	54

INTRODUCTION

The fish fauna of Tennessee is the most diverse in the United States, with approximately 307 species of native fish and about 30 to 33 introduced species (Etnier and Starnes 1993). Region IV has 7,837 km of streams that total approximately 5,711 ha in 21 east Tennessee counties. There are approximately 1,287 km classified as coldwater streams. Streams in Region IV, except for a few in Anderson, Campbell, and Claiborne counties (Cumberland River System streams) are in the Ridge and Valley and Blue Ridge physiographic provinces of the upper Tennessee River drainage basin. The main river systems in the region are the Clinch, Powell, Little Tennessee, mainstream Tennessee River, French Broad, Nolichucky, and Holston.

Streams and rivers across the state are of considerable value as they provide a variety of recreational opportunities. These include fishing, canoeing, swimming, and other riverine activities that are unmatched by other aquatic environments. Streams and rivers are also utilized as water sources both commercially and domestically. The management and protection of this resource is recognized by Tennessee Wildlife Resources Agency (TWRA) and has been put forth in the Strategic Plan (TWRA 2006) as a primary goal.

This is the nineteenth annual report on stream fishery data collection in TWRA's Region IV. The main purpose of this project is to collect baseline information on game and non-game fish and macroinvertebrate populations in the region. This baseline data is necessary to update and expand our Tennessee Aquatic Database System (TADS) and aid in the management of fisheries resources in the region.

Efforts to survey the region's streams have led to many cooperative efforts with other state and federal agencies. These have included the Tennessee Department of Environment and Conservation (TDEC), Tennessee Valley Authority (TVA), U.S. Forest Service (USFS), Oak Ridge National Laboratory (ORNL), and the National Park Service (NPS).

The information gathered for this project is presented in this report as river and stream accounts. These accounts include an introduction describing the general characteristics of the survey site, a study area and methods section summarizing site location and sampling procedures, a results section outlining the findings of the survey(s), and a discussion section, which allows us to summarize our field observations and make management recommendations.

METHODS

The streams to be sampled and the methods required are outlined in TWRA field request No. 04-06. A total of 3 rivers were sampled and are included in this report. Stream surveys were conducted from April to October 2006. Nine (IBI, CPUE) fish samples and five benthic samples were collected. Angler use and harvest surveys were conducted on two rivers between April 1 and September 30, 2006.

SAMPLE SITE SELECTION

Index of Biotic Integrity (IBI) sample sites were selected that would give the broadest picture of impacts to the watershed. We typically located our sample site in close proximity to the mouth of a stream to maximize resident species collection. However, we positioned survey sites far enough upstream to decrease the probability of collecting transient species. Large river sampling sites (Little River and Pigeon River) were selected based on historical sampling locations and available access points. Typically we selected sample areas in these rivers that represented the best available habitat for any given reach being surveyed. Sampling locations were delineated in the field utilizing hand held Geographical Positioning Units (GPS) and then digitally re-created using a commercially available software package.

WATERSHED ANALYSIS

Watershed size and/or stream order has historically been used to create relationships for determining maximum expected species richness for IBI analysis. This has been accomplished by plotting species richness for a number of sites against watershed areas and/or stream orders (Fausch et al. 1984). We chose to use watershed area (kilometer²) to develop our relationships as this variable has been shown to be a more reliable metric for predicting maximum species richness. Watershed areas (**the area upstream of the survey site**) were determined from USGS 1:24,000 scale maps.

FISH COLLECTIONS

Fish data were collected by employing an Index of Biological Integrity (Karr et al. 1986). Fish were collected with standard electrofishing (backpack) and seining techniques. A 5 x 1.3 meter seine was used to make hauls in shallow pool and run areas. Riffle and deeper run habitats were sampled with a seine in conjunction with a backpack electrofishing unit (100-600 VAC). An area approximately the length of the seine² (i.e., 5 meters x 5 meters) was electrofished in a downstream direction. A person with a dipnet assisted the person electrofishing in collecting those fish, which did not freely drift into the seine. Timed (5-min duration) backpack electrofishing runs were used to sample shoreline habitats. In both cases (seining or shocking) an estimate of area (meter²) covered on each pass was calculated. Fish collections were made in all habitat types within the selected survey reach. Collections were made repeatedly for each habitat type until no new species was collected for three consecutive samples for each habitat type. All fish collected from each sample were enumerated and in the case of game fish,

lengths obtained. Anomalies (e.g., parasites, deformities, eroded fins, lesions, or tumors) were noted along with occurrences of hybridization. After processing, the captured fish were either held in captivity or released into the stream where they could not be recaptured.

Catch-per-unit-effort samples (CPUE) were conducted in one river during 2006. Timed boat electrofishing runs were made in pool and shallower habitat where navigable. Efforts were made to sample the highest quality habitat in each sample site and include representation of all habitat types typical to the reaches surveyed. Total electrofishing time was calculated and was used to determine our catch-effort estimates (fish/hour).

Generally, fish were identified in the field and released. Problematic specimens were preserved in 10% formalin and later identified in the lab or taken to Dr. David A. Etnier at the University of Tennessee Knoxville (UTK) for identification. Most of the preserved fish collected in the 2006 samples will be catalogued into our reference collection or deposited in the University of Tennessee Research Collection of Fishes. Common and scientific names of fishes used in this report are after Nelson et al. (2004) and Etnier and Starnes (1993).

ANGLER SURVEYS

During 2006, two rivers were surveyed in order to characterize angler use of the fishery resources. The Pigeon and Nolichucky rivers were surveyed between April 1 and September 30 utilizing a roving creel design. A statistically valid survey schedule was generated for both rivers and days (week or weekend) and survey shifts (a.m. or p.m.) were assigned from the survey model. Surveyors would follow a predetermined route on each respective river and collect angler information during the specified survey period. A mail-in survey form was left on vehicles where anglers could not be interviewed. Survey data was compiled and sent to Nashville where it was analyzed by Pat Black with SAS. Generated outputs from this analysis are summarized in this report.

AGE and GROWTH

In order to address management questions pertaining to the age and growth characteristics of stream dwelling smallmouth bass, spotted bass, largemouth bass, and rock bass populations, statewide collection of otolith samples was initiated in 1995 by regional stream crews. No otoliths were collected from black bass or rock bass in 2006 as collections were made from these rivers between 1997 and 2000.

BENTHIC COLLECTIONS

Qualitative benthic samples were collected from each IBI fish sample site (5 total). These were taken with aquatic insect nets, by rock turning, and by selected pickings from as many types of habitat as possible within the sample area. Taxa richness and relative abundance are the primary considerations of this type of sampling. Taxa richness reflects the health of the benthic community and biological impairment is

reflected in the absence of pollution sensitive taxa such as Ephemeroptera, Plecoptera, and Trichoptera (EPT).

Large particles and debris were picked from the samples and discarded in the field. The remaining sample was preserved in 70% ethanol and later sorted in the laboratory. Organisms were enumerated and attempts were made to identify specimens to species level when possible. Many were identified to genus, and most were at least identified to family. Dr. David A. Etnier (UTK) examined problematic specimens and either made the determination or confirmed our identifications. Comparisons with identified specimens in our aquatic invertebrate collection were also useful in making determinations. For the most part, nomenclature of aquatic insects used in this report follows Brigham et al. (1982) and Louton (1982). Names of stoneflies (Plecoptera) are after Stewart and Stark (1988) and caddisflies are after Etnier et al. (1998). Benthic results are presented in tabular form with each stream account.

WATER QUALITY MEASUREMENTS

Basic water quality data were taken at most sites in conjunction with the fishery and benthic samples. The samples included temperature, pH, and conductivity. Data were taken from midstream and mid-depth at each site, using a YSI model 33 S-C-T meter. Scientific Products™ pH indicator strips were used to measure pH. Stream velocities were measured with a Marsh-McBirney Model 201D current meter. The Robins-Crawford "rapid crude" technique (as described by Orth 1983) was used to estimate flows. Water quality parameters were recorded on physicochemical data forms and are included with each stream account.

HABITAT QUALITY ANALYSIS

Beginning in 2004, the stream survey unit introduced an experimental habitat assessment form that built on the existing method by incorporating biological impairment and metric modifications to the standardized form. The major advantages of this evaluation procedure include more concise metrics and categories that identify the stream or river based on size, gradient, temperature, eco-region and alterations of flow based on groundwater or hydroelectric influences.

The other issue we wanted to address with this new evaluation was the development of our own biotic index for benthic macroinvertebrates. By assigning an overall value to the water quality, habitat, and biological impairment of a given reach of stream we can begin to assign tolerance values to associated benthic insect species collected during the survey. This will ultimately allow use to develop a more accurate biotic index for benthic macroinvertebrates for the Ridge and Valley and Blue Ridge Eco-regions of east Tennessee. The illustrations below depict the layout of the experimental form including the 14 habitat/water quality metrics, the biotic index adjustment, ecoregion classification, and stream type.

We feel that this form allows use to be more precise in our evaluation of the stream habitat quality and gives us a more defined evaluation pertaining to stream

morphology and location. We will continue to complete both habitat evaluations for each stream survey for the next couple of field seasons in order to fully evaluate the new form.

Experimental Stream Habitat Assessment Form

STREAM QUALITY ASSESSMENT FORM Tennessee Wildlife Resources Agency Stream Survey Unit

FORM: SQA-09-2004

STREAM: _____ DATE: _____
INVESTIGATOR: _____ SITE CODE: _____
LAT/LONG: _____ ELEVATION: _____

Rate Each Of The Following 14 Metrics:
0(EXCELLENT) 1(GOOD) 2(FAIR) 3(POOR) 4(VERY POOR)
note: 0 = pristine condition and 4 = worst condition

SCORE

- 1 **SILTATION** ☐
(fine particles that blanket [smother] the substrate)
- 2 **SUBSTRATE EMBEDDEDNESS** ☐
(interstitial spaces between gravel, cobble and boulder have become filled with fine deposits such as sand making the underside habitat unsuitable to aquatic life)
- 3 **BED-LOAD MOVEMENT** ☐
(condition pertaining to excessive bed load movement, and frequent formation and destruction of sand and gravel bars)
- 4 **STATE OF SMALL RIPARIAN VEGETATION** ☐
(grasses, shrubs, etc. that stabilize the soil surface and serve as runoff filters)
- 5 **STATE OF LARGE RIPARIAN VEGETATION** ☐
(canopy trees that provide long-term bank stability and shade)
- 6 **BANK STABILITY** ☐
(signs of bank erosion)
- 7 **PHYSICAL DAMAGE TO STREAM HABITAT BY DOMESTIC LIVESTOCK** ☐
(obvious signs of damage within riparian zone and instream habitat from livestock traffic)
- 8 **ALTERATIONS OF NATURAL PHYSICAL CHARACTERS OF STREAMBED** ☐
(channelization, gravel dredging, channel relocation, bridges, culverts, dams, fords etc.)
- 9 **TURBIDITY** ☐
(suspended solids "muddy or cloudy")
- 10 **POINT SOURCE POLLUTION** ☐
(FACTORY, MINING SOURCE, etc.)
(pipes or ditches conveying contaminated effluent adversely affecting water quality), chemical odor and/or unusual water or substrate coloration. (reddish algae [organic] or iron oxide [inorganic] often associated with severe earth disturbance)
- 11 **ENRICHMENT** ☐
(agricultural livestock waste and/or crop fertilizers, poorly functioning municipal waste water treatment facility or residential septic systems often indicated by filamentous algae etc.)
- 12 **ATYPICAL WATER QUALITY PARAMETERS (BASIC)** ☐
(unusually high or low pH, conductivity, dissolved oxygen, or temperature)

13 ENVIRONMENTALLY HARMFUL TRASH ☐

(human refuse including oil filters, engines, batteries, tires, etc. that may be toxic to aquatic organisms)

14 ALTERED STREAM FLOW (CFS) ☐

(abnormal fluctuations in flow volume [e.g. hydroelectric dam regulation], or low flow due to water consumption for municipal water, bottled water, crop irrigation, or other water demands.)

TOTAL ☐

BIOTIC INDEX ADJUSTMENT (BIA) ☐

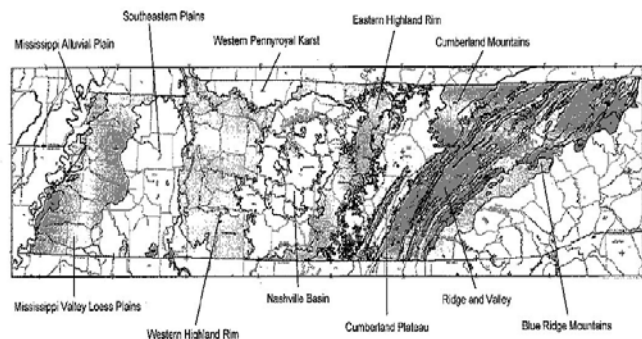
(does one or more of the previous 14 metrics seriously inhibit aquatic life?)

0 (no biological impairment) 5 (only the most sensitive taxa impaired)
10 (somewhat diverse but most intolerant forms absent) 15 (low diversity—tolerant forms only)
20 (little or no aquatic life present)

STREAM ASSESSMENT VALUE = TOTAL + BIA ☐

0 - 10 (EXCELLENT) 11 - 21 (GOOD) 22 - 32 (FAIR) 33 - 43 (POOR) ≥44 (VERY POOR)

INDICATE (CIRCLE) ECOREGION:



STREAM TYPE:

GRADIENT

LOW MOD HIGH

<0.01 0.01-0.05 >0.05

TEMPERATURE

COLD COOL WARM

<20°C <25°C >25°C Maximum Summer Temp

HEADWATER (0 - 2 METERS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SMALL CREEK (2.1 - 11.0 METERS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LARGE CREEK (11.1 - 21.0 METERS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SMALL RIVER 1 (21.1 - 111 METERS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SMALL RIVER 2 (111.1 - 201 METERS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MEDIUM RIVER (202 METERS - 502 METERS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LARGE RIVER (>503 METERS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CHECK IF STREAM IS:

A SPRING RUN (near source) ☐

A CREEK WITH SIGNIFICANT SPRING INFLUENCE ☐

A TAILWATER ☐

Ecoregion designations follow Griffith (USEPA) et al. Stream Type, and Gradient definitions generally follow Smith, R.K., P.L. Freeman, J.V. Higgins, K.S. Wheaton, T.W. Fitzhugh, K.J. Einstrom, A.A. Das. Priority Areas for Freshwater Conservation: A Biodiversity of the Southeastern United States. The Nature Conservancy, 2002.

DATA ANALYSIS

Twelve metrics described by Karr et al. (1986) were used to determine an IBI score for each stream surveyed. These metrics were designed to reflect fish community health from a variety of perspectives (Karr et al. 1986). Given that IBI metrics were developed for the midwestern United States, many state and federal agencies have modified the original twelve metrics to accommodate regional differences. Such modifications have been developed for Tennessee primarily through the efforts of TWRA (Bivens et al. 1995), TVA, and Tennessee Tech University. In developing our scoring criteria for the twelve metrics we reviewed pertinent literature [North American Atlas of Fishes (Lee et al. 1980), The Fishes of Tennessee (Etnier and Starnes 1993), various TWRA Annual Reports and unpublished data] to establish historical and more recent accounts of fishes expected to occur in the drainages we sampled. Scoring criteria for the twelve metrics were modified according to watershed size. Watersheds draining less than 13 kilometer² were assigned different scoring criteria than those draining greater areas. This was done to accommodate the inherent problems associated with small stream samples (e.g., lower catch rates and species richness). Young-of-the-year fish and non-native species were excluded from the IBI calculations. After calculating a final score, an integrity class was assigned to the stream reach based on that score. The classes used follow those described by Karr et al. (1986).

Karr et al. (1986) criteria

Total IBI score (sum of the 12 metric ratings)	Integrity Class	Attributes
58-60	Excellent	Comparable to the best situations without human disturbance; all regionally expected species for the habitat and stream size, including the most intolerant forms, are present with a full array of size classes; balanced trophic structure.
48-52	Good	Species richness somewhat below expectation, especially due to the loss of the most intolerant forms; some species are present with less than optimal abundance or size distributions; trophic structure

		shows some signs of stress.
40-44	Fair	Signs of additional deterioration include loss of intolerant forms, fewer species, highly skewed trophic structure (e.g., increasing frequency of omnivores and green sunfish or other tolerant species); older age classes of top predators may be rare.
28-34	Poor	Dominated by omnivores, tolerant forms, and habitat generalists; few top carnivores; growth rates and condition factors commonly depressed; hybrids and diseased fish often present.
12-22	Very poor	Few fish present, mostly introduced or tolerant forms; hybrids common; disease, parasites fin damage, and other anomalies regular.
	No fish	Repeated sampling finds no fish.

Catch-per-unit-effort analysis was performed one large river sampled during 2006. Total time spent electrofishing at each site was used to calculate the CPUE estimates for each species collected. Length categorization analysis (Gabelhouse 1984) was used to calculate Proportional Stock Density (PSD) and Relative Stock Density (RSD) for black bass and rock bass populations sampled.

Benthic data collected for the 2006 surveys were subjected to a biotic index that rates stream condition based on the overall taxa tolerance values and the number of Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa present. The North Carolina Division of Environmental Management (NCDEM) has developed a bioclassification index and associated criteria for the southeastern United States (Lenat 1993). This technique rates water quality according to scores derived from taxa tolerance values and EPT taxa richness values. The final derivation of the water quality classification is based on the combination of scores generated from the two indices. The criteria used to generate the biotic index values and EPT values are as follows:

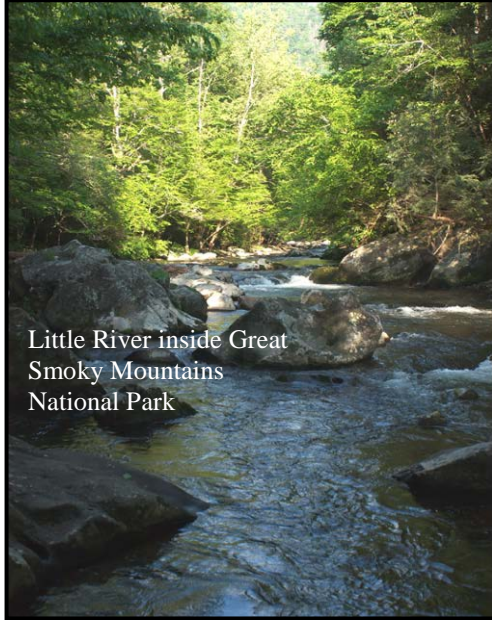
<u>Score</u>	<u>Biotic Index Values</u>	<u>EPT Values</u>
5 (Excellent)	< 5.14	> 33
4.6	5.14-5.18	32-33
4.4	5.19-5.23	30-31
4 (Good)	5.24-5.73	26-29
3.6	5.74-5.78	24-25
3.4	5.79-5.83	22-23
3	5.84-6.43	18-21
2.6	6.44-6.48	16-17
2.4	6.49-6.53	14-15
2	6.54-7.43	10-13
1.6	7.44-7.48	8-9
1.4	7.49-7.53	6-7
1 (Poor)	> 7.53	0-5

The overall result is an index of water quality that is designed to give a general state of pollution regardless of the source (Lenat 1993). Taxa tolerance rankings were based on those given by NCDEM (1995) with minor modifications for taxa, which did not have assigned tolerance values.

Little River

Introduction

Little River originates in Sevier County on the north slope of Clingmans Dome, in the Great Smoky Mountains National Park. It flows in a northwesterly direction for



about 95 kilometers, past Elkmont in the National Park, and Townsend, Walland, and Maryville in Blount County, and joins the Tennessee River near river mile 635.6. Fort Loudoun Reservoir, impounds the lower 6.8 miles of Little River with another 1.5 miles being impounded by the low head dam at Rockford (located at the backwaters of Fort Loudoun). In all, a little over eight lower river miles are impounded. Another 0.75 mile or so is impounded by Perrys Milldam downstream of Walland, near river mile 22. A third low head dam is located in Townsend near river mile 33.6. The river has a drainage area of approximately 982 km² at its confluence with the Tennessee River. The upper reach of the river (upstream of Walland) is located in the

Blue Ridge physiographic province, and then transitions into the Ridge and Valley province from Walland to Fort Loudoun Reservoir. Little River is a very scenic stream in the Great Smoky Mountains National Park. There, it drains an area containing some of the most spectacular scenery in the southeastern United States. The Little River fishery within the National Park boundary is primarily wild rainbow and brown trout with smallmouth bass in the lower reaches. An excellent trout fishery exists, and is managed by the National Park Service. Little River's gradient becomes moderate as it leaves the National Park and flows through the Tuckaleechee Valley from Townsend to Walland. Excellent populations of smallmouth bass and rock bass exist there, and rainbow trout are stocked in spring and fall as water temperatures allow. This portion of the river has many developed campgrounds and is a popular recreation destination for tourists. While not as developed as Pigeon Forge, the Townsend area has grown significantly over the past two decades. Downstream of Walland, Little River leaves the mountains and no longer displays the extreme clarity and attractive rocky bottom of its upper reaches. Here it enters the Ridge and Valley province and resembles the more typical large river habitat with lower gradient and large deep pools interspersed with shallow shoal areas. Downstream of Perrys Milldam, the fishery, while still primarily smallmouth bass and rock bass, declines in quality relative to the upstream reach. This is probably related to limited availability of preferred smallmouth bass habitat. Near the small community of Rockford, Little River flows into a surprisingly large (given the size of the stream) embayment of Fort Loudon Lake. The Little River forms the boundary between Blount County and Knox County for the last few miles of its course.

Little River represents an important recreational resource for the state both in consumptive and non-consumptive uses. It supports an active tubing/rafting industry and

is an important recreational resource for local residents and tourists alike. It is also the municipal water source of the cities of Alcoa and Maryville. It provides critical habitat for species of special concern and is home to over 50 species of fish (four listed federally). Additionally, its upper reach supports one of east Tennessee's better warm water sport fisheries. It provides anglers with the opportunity to catch all species of black bass, rock bass, and even stocked rainbow trout when water temperatures allow.

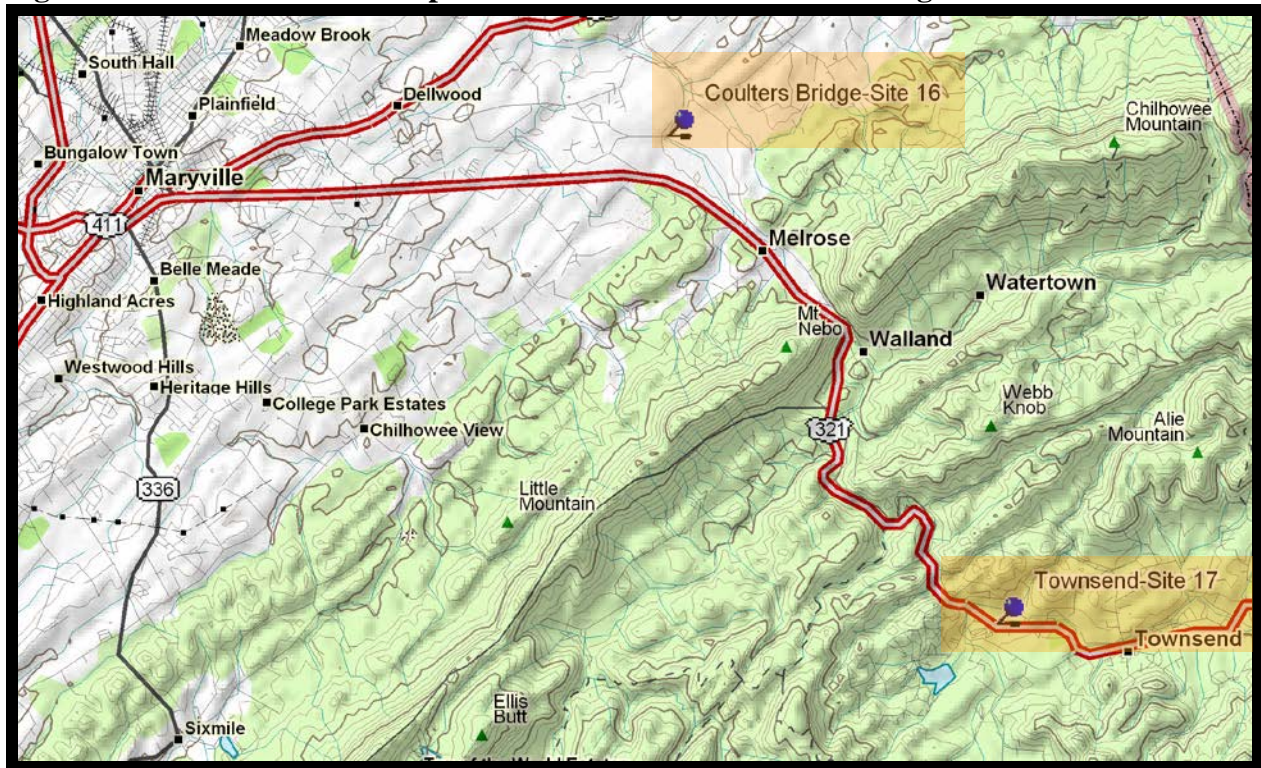
Study Area and Methods



Our 2006 survey of Little River was confined to two IBI sites (Coulters Bridge and Townsend). We cooperated with several agencies in conducting these two samples between July 11 and 14. The Coulters Bridge site (16) is located in the Ridge and Valley Province of Blount County while the Townsend site (17) lies in the transitional zone between the Blue Ridge and the Ridge and Valley Provinces (Figure 1).

Public access along the river is primarily limited to bridge crossings and small “pull-outs” along roads paralleling the river. There are several primitive launching areas for canoes or small boats and one developed access area managed by the Agency (Perrys Mill).

Figure 1. Site locations for samples conducted in Little River during 2006.



Fish were collected according to the IBI criteria described in the methods section of this report. Both backpack and boat electrofishing were used to collect samples from both stations. Qualitative benthic macroinvertebrates were collected at both stations and analyzed to produce a biotic index score similar to those derived for the fish IBI.

Results

Collaborative community assessments of Little River have been ongoing since the late 1980's. These surveys have primarily focused on evaluating relative health changes in the fish community. Two Index of Biotic Integrity surveys were conducted in July



2006 at Coulter's Bridge (river mile 20) and Townsend (river mile 29.8). A total of 50 fish species were collected at the Coulters Bridge site while 31 were observed at Townsend. Overall, The IBI analysis indicated the fish community was in excellent condition at Coulters Bridge (IBI score 58). The condition of the fish community remained the same (IBI score 58) at the upper most station, Townsend, and had actually improved ten points from the previous years sample. Several rare or endangered species of fish inhabit Little River, and thus, the protection of the watershed is a high priority of

managing agencies and local conservation groups. Table 1 lists the species and number of fish collected at the two IBI stations.

Table 1. Fish species collected at two Little River IBI stations during 2006.

Site	Species	Number Collected
420060516 (Coulters Bridge)	<i>Ambloplites rupestris</i>	26
420060516 (Coulters Bridge)	<i>Ameiurus melas</i>	3
420060516 (Coulters Bridge)	<i>Ameiurus natalis</i>	1
420060516 (Coulters Bridge)	<i>Aplodinotus grunniens</i>	6
420060516 (Coulters Bridge)	<i>Campostoma oligolepis</i>	50
420060516 (Coulters Bridge)	<i>Cottus carolinae</i>	45
420060516 (Coulters Bridge)	<i>Cyprinella galactura</i>	76
420060516 (Coulters Bridge)	<i>Cyprinella spiloptera</i>	1
420060516 (Coulters Bridge)	<i>Cyprinus carpio</i>	1
420060516 (Coulters Bridge)	<i>Dorosoma cepedianum</i>	7
420060516 (Coulters Bridge)	<i>Erimystax insignis</i>	2
420060516 (Coulters Bridge)	<i>Etheostoma blennioides</i>	14
420060516 (Coulters Bridge)	<i>Etheostoma camurum</i>	5
420060516 (Coulters Bridge)	<i>Etheostoma jessiae</i>	6
420060516 (Coulters Bridge)	<i>Etheostoma rufilineatum</i>	376
420060516 (Coulters Bridge)	<i>Etheostoma tennesseense</i>	15
420060516 (Coulters Bridge)	<i>Etheostoma vulneratum</i>	1
420060516 (Coulters Bridge)	<i>Etheostoma zonale</i>	3
420060516 (Coulters Bridge)	<i>Fundulus catenatus</i>	1
420060516 (Coulters Bridge)	<i>Hybopsis amblops</i>	104
420060516 (Coulters Bridge)	<i>Hypentelium nigricans</i>	21
420060516 (Coulters Bridge)	<i>Ictalurus punctatus</i>	1
420060516 (Coulters Bridge)	<i>Lampetra appendix</i>	4
420060516 (Coulters Bridge)	<i>Lepisosteus osseus</i>	1
420060516 (Coulters Bridge)	<i>Lepomis auritus</i>	45
420060516 (Coulters Bridge)	<i>Lepomis cyanellus</i>	15
420060516 (Coulters Bridge)	<i>Lepomis macrochirus</i>	41
420060516 (Coulters Bridge)	<i>Lepomis microlophus</i>	1
420060516 (Coulters Bridge)	<i>Luxilus chrysocephalus</i>	21
420060516 (Coulters Bridge)	<i>Luxilus coccogenis</i>	42
420060516 (Coulters Bridge)	<i>Lythrurus lirus</i>	10
420060516 (Coulters Bridge)	<i>Micropterus dolomieu</i>	17
420060516 (Coulters Bridge)	<i>Micropterus punctulatus</i>	3
420060516 (Coulters Bridge)	<i>Minytrema melanops</i>	3
420060516 (Coulters Bridge)	<i>Moxostoma carinatum</i>	4
420060516 (Coulters Bridge)	<i>Moxostoma duquesnei</i>	42
420060516 (Coulters Bridge)	<i>Moxostoma erythrurum</i>	20
420060516 (Coulters Bridge)	<i>Nocomis micropogon</i>	11
420060516 (Coulters Bridge)	<i>Notropis leuciodus</i>	93
420060516 (Coulters Bridge)	<i>Notropis micropteryx</i>	75
420060516 (Coulters Bridge)	<i>Notropis photogenis</i>	27
420060516 (Coulters Bridge)	<i>Notropis telescopus</i>	31
420060516 (Coulters Bridge)	<i>Notropis volucellus</i>	34
420060516 (Coulters Bridge)	<i>Noturus eleutherus</i>	8
420060516 (Coulters Bridge)	<i>Percina aurantiaca</i>	6
420060516 (Coulters Bridge)	<i>Percina caprodes</i>	3
420060516 (Coulters Bridge)	<i>Percina evides</i>	31
420060516 (Coulters Bridge)	<i>Percina macrocephala</i>	3
420060516 (Coulters Bridge)	<i>Phenacobius uranops</i>	2
420060516 (Coulters Bridge)	<i>Semotilus atromaculatus</i>	1
420060517 (Townsend)	<i>Ambloplites rupestris</i>	45
420060517 (Townsend)	<i>Campostoma oligolepis</i>	65

Table 1. Continued.

Site	Species	Number Collected
420060517 (Townsend)	<i>Cottus carolinae</i>	101
420060517 (Townsend)	<i>Cyprinella galactura</i>	132
420060517 (Townsend)	<i>Erimystax insignis</i>	8
420060517 (Townsend)	<i>Etheostoma blennioides</i>	7
420060517 (Townsend)	<i>Etheostoma rufilineatum</i>	170
420060517 (Townsend)	<i>Etheostoma tennesseense</i>	13
420060517 (Townsend)	<i>Etheostoma zonale</i>	1
420060517 (Townsend)	<i>Fundulus catenatus</i>	1
420060517 (Townsend)	<i>Hybopsis amblops</i>	44
420060517 (Townsend)	<i>Hypentelium nigricans</i>	24
420060517 (Townsend)	<i>Ichthyomyzon greeleyi</i>	8
420060517 (Townsend)	<i>Lampetra appendix</i>	49
420060517 (Townsend)	<i>Lepomis auritus</i>	4
420060517 (Townsend)	<i>Lepomis macrochirus</i>	9
420060517 (Townsend)	<i>Luxilus chrysocephalus</i>	9
420060517 (Townsend)	<i>Luxilus coccogenis</i>	40
420060517 (Townsend)	<i>Lythrurus lirus</i>	2
420060517 (Townsend)	<i>Micropterus dolomieu</i>	5
420060517 (Townsend)	<i>Micropterus salmoides</i>	1
420060517 (Townsend)	<i>Moxostoma duquesnei</i>	15
420060517 (Townsend)	<i>Moxostoma erythrurum</i>	1
420060517 (Townsend)	<i>Nocomis micropogon</i>	14
420060517 (Townsend)	<i>Notropis leuciodus</i>	399
420060517 (Townsend)	<i>Notropis micropteryx</i>	19
420060517 (Townsend)	<i>Notropis photogenis</i>	8
420060517 (Townsend)	<i>Notropis telescopus</i>	225
420060517 (Townsend)	<i>Percina aurantiaca</i>	1
420060517 (Townsend)	<i>Percina burtoni</i>	1
420060517 (Townsend)	<i>Percina evides</i>	1

Benthic macroinvertebrates collected in our sample at Townsend comprised 37 families representing identified 50 genera (Table 2). The most abundant group in our collection was the caddisflies comprising 28.5% of the total sample. Overall, a total of 58 taxa were identified from the sample of which 31 were EPT. Based on the EPT taxa richness and overall biotic index of all species collected, the relative health of the benthic community was classified as “good to excellent” (4.7).

Table 2. Taxa list and associated biotic statistics for benthic macroinvertebrates collected from Little River at Townsend.

ORDER	FAMILY	SPECIES	NUMBER	PERCENT
ANNELIDA				0.3
	Oligochaeta		1	
COLEOPTERA				9
	Dryopidae	<i>Helichus adults</i>	2	
	Elmidae	<i>Ancyronyx variegatus</i>	1	
		<i>Macronychus glabratus</i> larvae & adults	5	
		<i>Optiosevus trivittatus</i> adults	3	
		<i>Promoresia elegans</i> larva & adults	4	
		<i>Stenelmis</i> larvae and adult	3	
	Gyrinidae	<i>Dineutus discolor</i> male and female	2	
		<i>Dineutus</i> larva	2	
	Psephenidae	<i>Psephenus herricki</i>	11	
DIPTERA				9.5
	Athericidae	<i>Atherix lantha</i>	5	
	Chironomidae		15	
	Simuliidae		12	
	Tipulidae	<i>Antocha</i>	3	
EPHEMEROPTERA				27.7

Table 2. Continued.

	Baetidae	<i>Baetis</i>	14	
		<i>Centroptilum</i>	1	
	Caenidae	<i>Caenis</i>	2	
	Ephemerellidae	<i>Serratella</i>	5	
	Heptageniidae	<i>Epeorus rubidus/subpallidus</i>	12	
		<i>Leucrocuta</i>	5	
		<i>Maccaffertium</i> early instars	8	
		<i>Maccaffertium ithaca</i>	13	
		<i>Maccaffertium mediopunctatum</i>	2	
		<i>Maccaffertium modestum</i>	1	
		<i>Stenacron</i>	8	
	Isonychiidae	<i>Isonychia</i>	26	
	Leptohyphidae	<i>Tricorythodes</i>	2	
	Neophemeridae	<i>Neophemera purpurea</i>	3	
GASTROPODA				4.3
	Ancylidae	<i>Ferrissia</i>	3	
	Pleuroceridae	<i>Leptoxis</i>	7	
		<i>Pleurocera</i>	6	
HETEROPTERA				0.8
	Gerridae	<i>Gerris remigis</i> female	1	
	Veliidae	<i>Rhagovelia obesa</i> male and female	2	
MEGALOPTERA				2.7
	Corydalidae	<i>Corydalus cornutus</i>	6	
		<i>Nigronia serricornis</i>	4	
ODONATA				13.6
	Aeshnidae	<i>Boyeria vinosa</i>	30	
	Calopterygidae	<i>Calopteryx</i>	2	
	Coenagrionidae	<i>Argia</i>	1	
	Gomphidae	<i>Gomphus</i> (Genus A) <i>rogersi</i>	1	
		<i>Stylogomphus albistylus</i>	4	
	Macromiidae	<i>Macromia</i>	12	
PELECYPODA				0.8
	Corbiculidae	<i>Corbicula fluminea</i>	3	
PLECOPTERA				2.7
	Leuctridae	<i>Leuctra</i>	7	
	Perlidae	<i>Acroneuria abnormis</i>	2	
		<i>Perlesta</i>	1	
TRICHOPTERA				28.5
	Brachycentridae	<i>Micrasema wataga</i>	6	
	Dipsuedopsidae	<i>Phylocentropus</i>	1	
	Goeridae	<i>Goera</i> larvae and pupa	5	
	Hydropsychidae	<i>Ceratopsyche morosa</i>	10	
		<i>Ceratopsyche sparna</i>	8	
		<i>Cheumatopsyche</i>	13	
		<i>Hydropsyche franclemonti</i>	5	
		<i>Hydropsyche venularis</i>	18	
	Lepidostomatidae	<i>Lepidostoma</i> larvae & pupa	3	
	Leptoceridae	<i>Nectopsyche</i>	2	
		<i>Oecetis avara</i>	4	
		<i>Triaenodes ignitus</i>	15	
	Limnephilidae	<i>Pycnopsyche divergens</i>	1	
		<i>Pycnopsyche</i> luculenta group	2	
	Polycentropodidae	<i>Polycentropus</i>	12	
		<i>Triaenodes ignitus</i>	15	
		Total	368	

TAXA RICHNESS = 58

EPT TAXA RICHNESS = 31

BIOCLASSIFICATION = 4.7 (GOOD/EXCELLENT)

Benthic macroinvertebrates collected in our sample at Coulter's Bridge comprised 31 families representing 44 identified genera (Table 3). The most abundant group in our collection was the mayflies comprising 38.7% of the total sample. Overall, a total of 51 taxa were identified from the sample of which 23 were EPT. Based on the EPT taxa richness and overall biotic index of all species collected, the relative health of the benthic community was classified as "good" (4.2).

Table 3. Taxa list and associated biotic statistics for benthic macroinvertebrates collected from Little River at Coulter's Bridge.

ORDER	FAMILY	SPECIES	NUMBER	PERCENT
ANNELIDA				4.2
	Oligochaeta		13	
COLEOPTERA				7.0
	Dryopidae	<i>Helichus</i> adults	2	
	Elmidae	<i>Macronychus glabratus</i> adults	4	
		<i>Optioservus trivittatus</i> adults	2	
		<i>Promoresia elegans</i> adults and larva	5	
	Gyrinidae	<i>Dineutus discolor</i> adult	1	
		<i>Dineutus</i> larvae	2	
	Psephenidae	<i>Psephenus herricki</i>	6	
DIPTERA				2.9
	Athericidae	<i>Atherix lantha</i>	3	
	Chironomidae		2	
	Simuliidae		2	
	Tipulidae	<i>Tipula</i>	2	
EPHEMEROPTERA				38.7
	Baetidae	<i>Baetis</i>	11	
	Ephemerellidae	<i>Serratella</i>	2	
	Heptageniidae	<i>Epeorus rubidus/subpallidus</i>	6	
		<i>Heptagenia</i>	3	
		<i>Leucrocuta</i>	6	
		<i>Maccaffertium</i> early instars	11	
		<i>Maccaffertium mediopunctatum</i>	13	
		<i>Maccaffertium modestum</i>	5	
		<i>Rhithrogena</i>	1	
	Isonychiidae	<i>Isonychia</i>	63	
GASTROPODA				2.9
	Pleuroceridae	<i>Leptoxis</i>	7	
		<i>Pleurocera</i>	2	
HETEROPTERA				1.0
	Gerridae	<i>Metrobates</i> nymph	1	
	Veliidae	<i>Rhagovelia obesa</i> adult female	2	
MEGALOPTERA				4.8
	Corydalidae	<i>Corydalus cornutus</i>	8	
		<i>Nigronia serricornis</i>	3	
	Sialidae	<i>Sialis</i>	4	
ODONATA				9.3
	Aeshnidae	<i>Boyeria vinosa</i>	8	
	Calopterygidae	<i>Hataerina americana</i>	7	
	Coenagrionidae	<i>Argia</i>	3	
	Gomphidae	<i>Dromogomphus spinosus</i>	2	
		<i>Gomphus lividus</i>	1	
		<i>Hagenius brevistylus</i>	2	
		<i>Hylogomphus</i>	1	
		<i>Lanthus vernalis</i>	1	
	Macromiidae	<i>Macromia</i>	4	
PELECYPODA				0.6
	Corbiculidae	<i>Corbicula fluminea</i>	2	
PLECOPTERA				5.1
	Perlidae	<i>Perlesta</i> two forms	13	
	Pteronarcyidae	<i>Pteronarcys (Allonarcys) proteus</i> type	1	
		<i>Pteronarcys dorsata</i>	2	
TRICHOPTERA				23.6
	Brachycentridae	<i>Micrasema</i> early instars	2	
	Goeridae	<i>Goera</i> pupae	3	
	Hydropsychidae	<i>Ceratopsyche morosa</i>	8	
		<i>Ceratopsyche sparna</i>	1	
		<i>Cheumatopsyche</i>	21	
		<i>Hydropsyche franclemonti</i>	1	
		<i>Hydropsyche venularis</i>	32	
	Leptoceridae	<i>Oecetis</i>	1	
		<i>Trienodes ignitus</i>	2	
	Polycentropodidae	<i>Neureclipsis crepuscularis</i>	1	
		<i>Polycentropus</i>	2	
Total			313	

TAXA RICHNESS = 51

EPT TAXA RICHNESS = 23

BIOCLASSIFICATION = 4.2 (GOOD)

Discussion

Little River provides anglers with the opportunity to catch all species of black bass along with rock bass. Because of the low numbers of spotted and largemouth bass in Little River, it should not be considered to contain a viable sport fishery for these species.

The river represents an outstanding resource in the quality of the water and the species that inhabit it. With the growing development in the watershed it will be imperative to monitor activities such that mitigation measures can be taken to ensure that the river maintains its outstanding water quality and aesthetic value. Continued efforts by the watershed group will continue to play an important role in the management of the watershed and serve as a “watchdog” for unregulated activities.

Trout stocking during suitable months is very popular for residents and non-residents visiting the area. This program should continue at the current level unless use dictates the need for program expansion.

TWRA should continue to be involved with the cooperative community assessment surveys each year. These are important indicators of the health of one of the regions best streams and serves as a benchmark in evaluating other streams of similar size and character. Sport fishery surveys on Little River will be conducted on a three-year rotation in order to assess any changes in the fishery. Our return trip in 2008 to look at the sport fish will in all likelihood focus on the sample sites surveyed in 2005, providing no new or more efficient sampling scheme is developed.

Management Recommendations

1. Initiate an angler use and harvest survey.
2. Develop a fishery management plan for the river.
3. Cooperate with the local watershed organization to protect and enhance the river and its tributaries.

Nolichucky River

Introduction

The Nolichucky River represents an important recreational resource for the state both in consumptive and non-consumptive uses. It provides critical habitat for species of special concern and is home to approximately 50 species of fish and has historically contained at least 21 species of mussels (Ahlstedt 1986). Additionally, it supports one of east Tennessee's better warm water sport fisheries. The Nolichucky River and its tributaries have been the subject of numerous biological and chemical investigations that span some 40 years. These investigations have concentrated on evaluating pollution levels and documenting sources for mitigation. Much of the upper reach of the Nolichucky River has been consistently impacted by sand dredging and mica mining in North Carolina and extensive agricultural development along the entire length in Tennessee. However, in recent years, the Nolichucky River has improved in water quality as a result of mitigation and education conducted during these early studies. The Agency has made extensive sport fish surveys of the river beginning in 1998 and is scheduled to return to the river in 2007 to continue our long term sport fish monitoring.

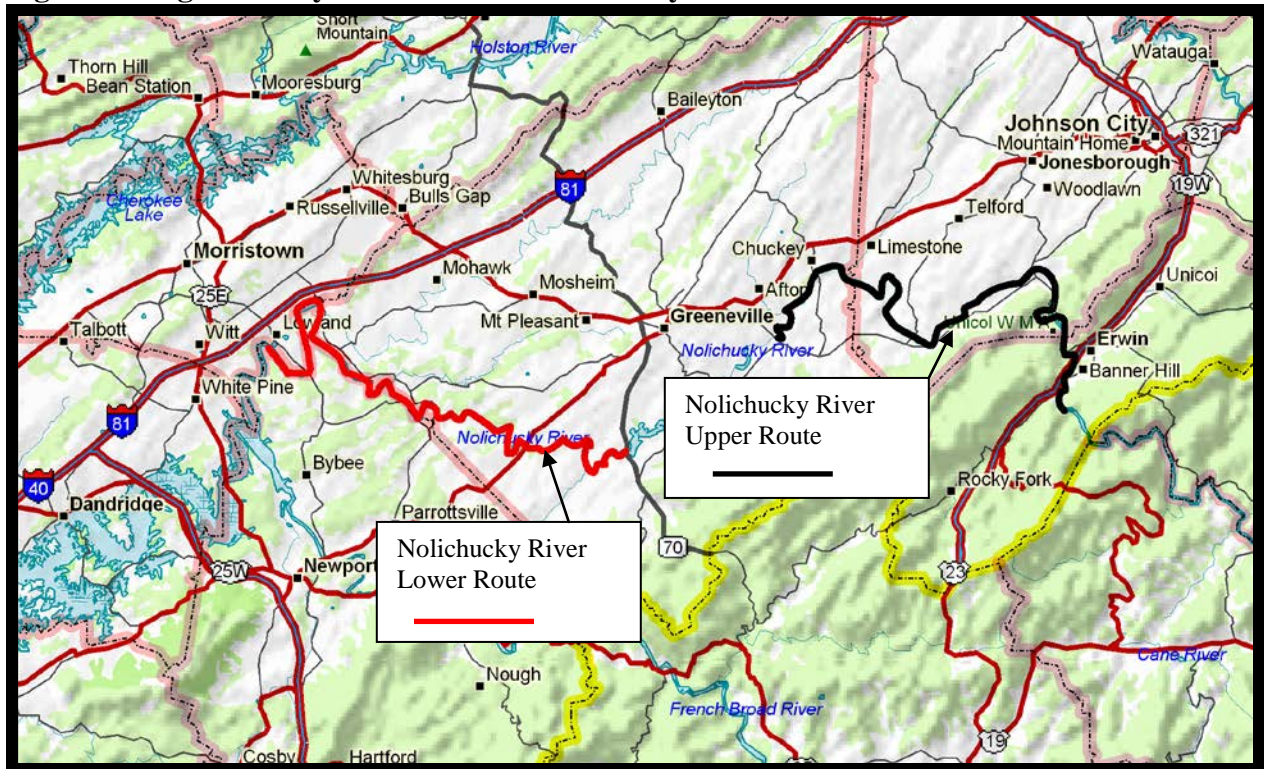
The lack of quantitative angler use and harvest data for the Nolichucky River has been a missing component in fully evaluating these fisheries and how they are utilized. Until 2001 angler use data on east Tennessee warm water rivers was non-existent. The



Nolichucky River Anglers

North Fork Holston River was surveyed in 2001 under contract with Tennessee Tech. University (Betolli 2002). During 2006, the regional stream survey unit collected angler use information on the Nolichucky River between April 1 and September 30. A statistically valid roving creel survey was generated for the river and days (week or weekend) and survey shifts (a.m. or p.m.) were assigned from the survey model. The average number of daylight hours during each month was used to determine survey workdays, which was divided into a.m. (dawn to 1300) and p.m. shifts (1300 to sunset). Probabilities for a.m. and p.m. shifts were 40% and 60%, respectively. Sample days were chosen at random. Surveyors followed predetermined routes (Figure 2) on the river and collected angler information during the specified survey period. Given the length of the Nolichucky, the entire length of the river could not be surveyed during any given sample shift. To accommodate this, we divided the river into two sections (Upper and Lower Nolichucky) which were delineated by Nolichucky Dam (Davy Crockett Dam). A mail-in survey form was left on vehicles where anglers could not be interviewed.

Figure 2. Angler survey routes for the Nolichucky River.



Angler Effort

Angling effort for the Nolichucky River was recorded in hours. Estimates of the actual number of recorded fishing hours were made by month, the entire sampling period (April-September) and by species fished for (hours spent targeting specific species). A total of 40,158 angler effort hours (27,187 upper Nolichucky, 12,971 lower Nolichucky) were expended during the 2006 survey period. The highest effort for the upper Nolichucky (Figure 3) was observed in May (7,514 hours) followed by the month of July (6,550 hours). The lower Nolichucky saw its highest angler use during June (5,030 hours) followed by 2,425 hours of effort in July. A total of 10,516 trips (7,716 upper

Nolichucky, 2,800 lower Nolichucky) were made to the river during the survey period with an average trip length of 4.0 hours (Figure 4). The most trips recorded to the Nolichucky in its entirety took place in June with an average trip length of 3.6 hours.

Figure 3. Angler effort (hours) and total number of trips by month taken to the upper Nolichucky River during 2006.

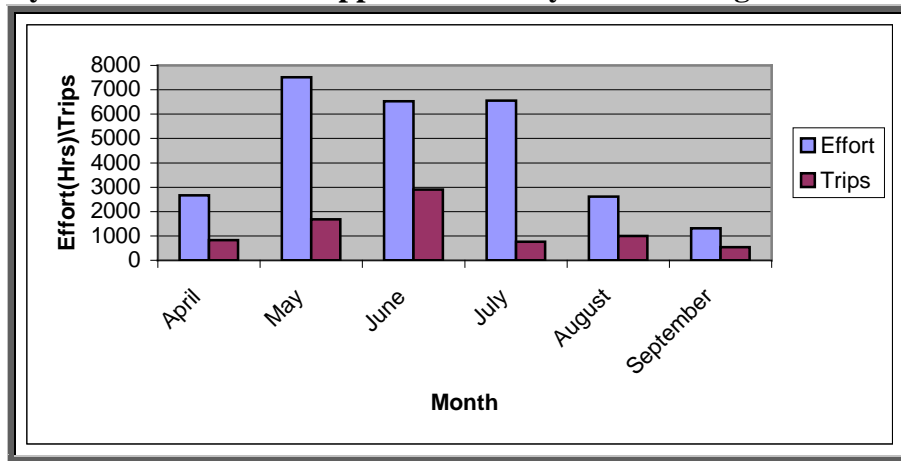
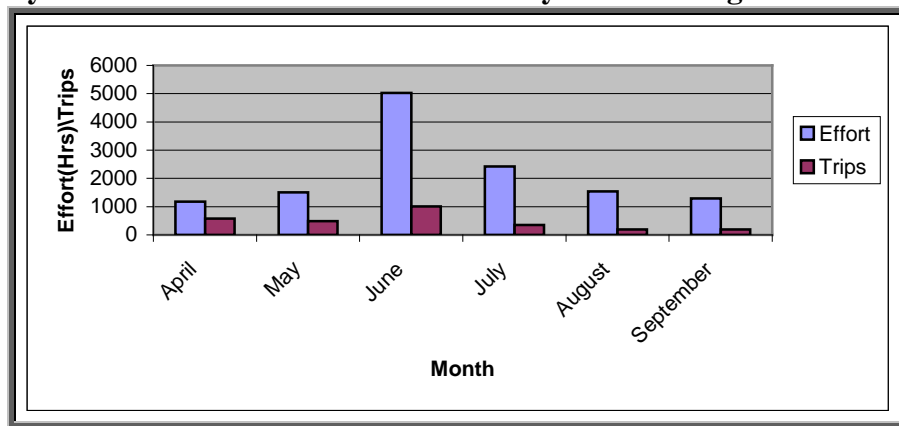
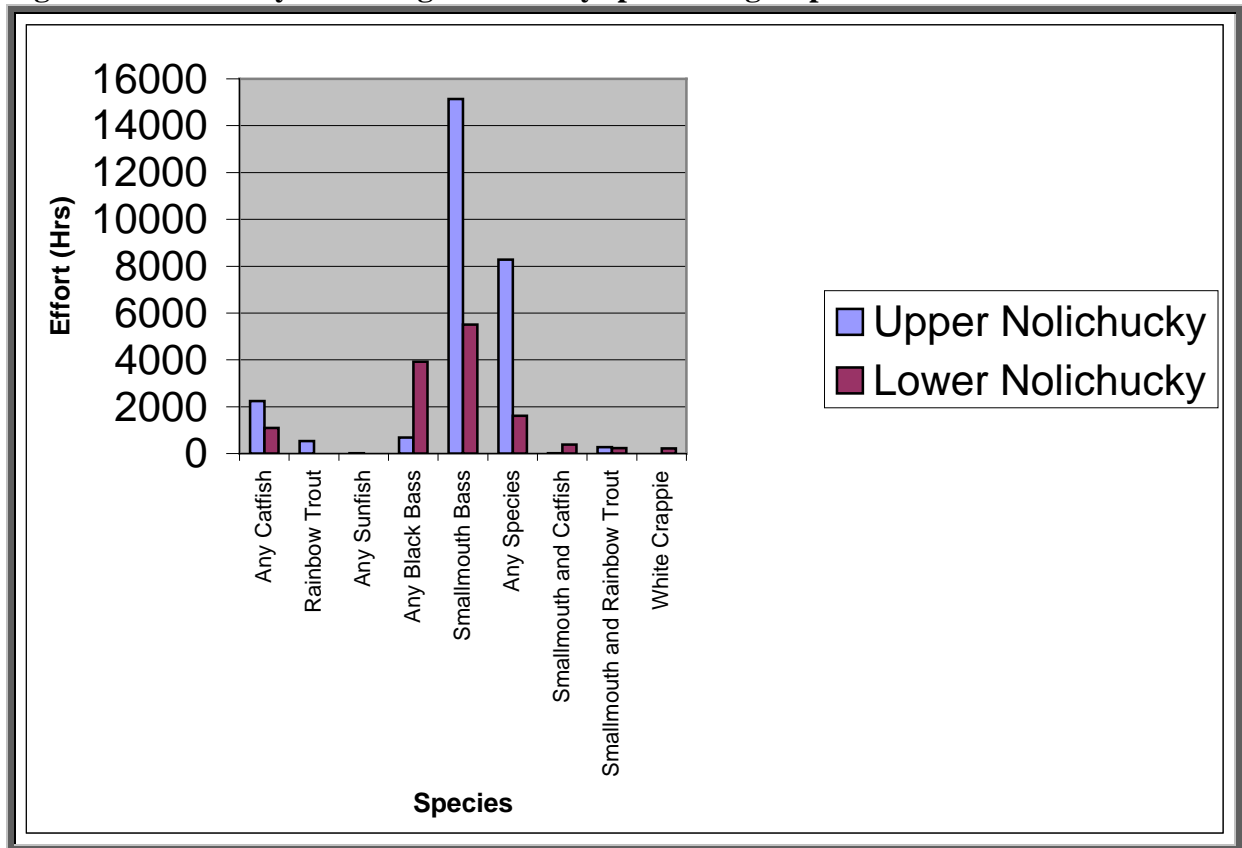


Figure 4. Angler effort (hours) and total number of trips by month taken to the lower Nolichucky River during 2006.



As expected, anglers expended the most effort exclusively in pursuit of smallmouth bass (20,647 hours) irregardless of the section of river they were fishing (Figure 5). The majority of time spent angling for smallmouth bass was focused in the upper Nolichucky (15,144 hours) while the lower Nolichucky only accounted for 27% (5,503 hours) of the total effort. In the upper Nolichucky, anglers fishing for any species accounted for 8,284 hours while anglers following the same philosophy on the lower Nolichucky only logged in 1,618 hours.

Figure 5. Nolichucky River angler effort by species or group.



Angler Catch, Harvest, and Release

Based on the anglers interviews collected during 2006, an estimated total of 25,043 fish were caught between April and September from the Nolichucky River. The distribution of catch between the upper and lower Nolichucky were 14,147 and 10,896, respectively. Of the total number caught 19,823 were released (11,624 released in upper Nolichucky, 8,199 released in lower Nolichucky). Twenty-one percent of the fish caught in the Nolichucky were harvested (10% (2,253) upper Nolichucky, 11% (2,698) lower Nolichucky). Based on the expanded estimates for the Nolichucky, 10,031 smallmouth bass were caught of which 1,373 (13.6%) were harvested. The distribution of the harvest was quite disproportionate between the upper and lower Nolichucky. Only 279 (20%) smallmouth were harvested from the upper Nolichucky, while 1,094 (80%) were taken from the lower portion of the river. Average catch per hour for smallmouth bass for the entire Nolichucky was 0.77. Anglers fishing the lower Nolichucky had a higher success rate 0.91/hour than did anglers fishing the upper reach (0.63/hour) of the river (Table 4). Smallmouth bass was the most frequently caught species on both sections of the river (averaged 40% of total catch). In the upper Nolichucky, rock bass (13% of catch) was the second most frequent species caught by anglers. Channel catfish was an important species in the lower Nolichucky, contributing about 20% of the total catch (Table 5). Rainbow trout stocked by the federal hatchery in Erwin was a significant component of the catch in the upper Nolichucky, and accounted for 38% of the total number of fish harvested in this section.

Table 4. CPUE estimates based on catch of intended species for the Nolichucky River (upper and lower).

<i>Nolichucky River Upper</i>						
INTENDED SPECIES	INTENDED	RSE	INTENDED	RSE	INTENDED	RSE
	CATCH		HARVEST		RELEASE	
	PER HOUR		PER HOUR		PER HOUR	
Any Catfish	0.14919	27.4572	0.07898	39.196	0.07021	41.6718
Rainbow Trout	0.07455	75.1317	0.04970	104.534	0.02485	98.7238
Any Sunfish	0.00000	.	0.00000	.	0.00000	.
Any Black Bass	0.40000	96.0000	0.00000	.	0.40000	96.0000
Smallmouth Bass (SMB)	0.63636	15.3959	0.03156	43.536	0.60481	16.1406
Any Species	0.31294	15.3091	0.06174	43.601	0.25120	14.8815
SMB and Catfish	0.00000	.	0.00000	.	0.00000	.
SMB and Rainbow Trout	0.45317	45.5417	0.45317	45.542	0.00000	.

<i>Nolichucky River Lower</i>						
INTENDED SPECIES	INTENDED	RSE	INTENDED	RSE	INTENDED	RSE
	CATCH		HARVEST		RELEASE	
	PER HOUR		PER HOUR		PER HOUR	
Any Catfish	0.17908	52.8019	0.16117	63.2497	0.01791	62.5889
Any Black Bass	1.09574	39.1690	0.00000	.	1.09574	39.1690
Smallmouth Bass (SMB)	0.91294	21.6608	0.07057	45.2766	0.84237	23.6718
White Crappie	0.00000	.	0.00000	.	0.00000	.
Any Species	0.70969	26.0645	0.24757	56.3003	0.46212	33.8968
SMB and Catfish	0.19342	8.9478	0.19342	8.9478	0.00000	.
SMB and Rainbow Trout	0.16667	.	0.00000	.	0.16667	.

Table 5. Expanded species composition for the Nolichucky River (upper and lower) including the number of fish harvested, released, and caught.

<i>Nolichucky River Upper</i>						
SPECIES	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
	HARVESTED	COMP HARVEST	RELEASED	COMP RELEASE	CAUGHT	COMP CATCH
Stoneroller	0.00	0.00	454.86	3.91	454.86	3.22
Carp	34.09	1.35	302.45	2.60	336.54	2.38
River Chub	0.00	0.00	181.98	1.57	181.98	1.29
Minnow spp.	0.00	0.00	60.66	0.52	60.66	0.43
Redhorse spp.	0.00	0.00	718.51	6.18	718.51	5.08
Golden Redhorse	19.34	0.77	0.00	0.00	19.34	0.14
Channel Catfish	252.51	10.01	186.45	1.60	438.96	3.10
Flathead Catfish	172.67	6.84	120.96	1.04	293.64	2.08
Rainbow Trout	954.95	37.85	271.08	2.33	1226.03	8.67
Rock Bass	221.82	8.79	1674.83	14.41	1896.65	13.41
Any Sunfish	344.82	13.67	1271.65	10.94	1616.47	11.43
Redbreast Sunfish	58.03	2.30	151.62	1.30	209.65	1.48
Bluegill	185.66	7.36	845.63	7.27	1031.28	7.29
Smallmouth Bass	279.37	11.07	4693.90	40.38	4973.27	35.15
Spotted Bass	0.00	0.00	505.86	4.35	505.86	3.58
Largemouth Bass	0.00	0.00	183.43	1.58	183.43	1.30

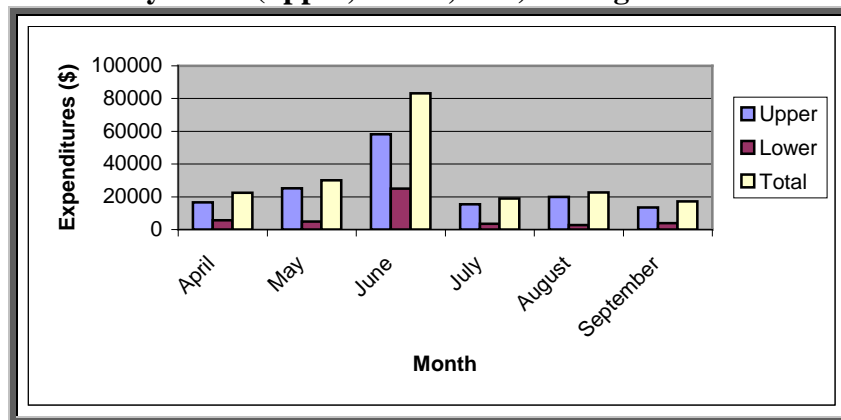
Table 5. Continued.

<i>Nolichucky River Lower</i>						
SPECIES	NUMBER HARVESTED	PERCENT COMP HARVEST	NUMBER RELEASED	PERCENT COMP RELEASE	NUMBER CAUGHT	PERCENT COMP CATCH
Any Gar	0.00	0.00	41.53	0.51	41.53	0.38
Carp	0.00	0.00	41.53	0.51	41.53	0.38
Redhorse spp.	0.00	0.00	90.73	1.11	90.73	0.83
Any Catfish	0.00	0.00	346.72	4.23	346.72	3.18
Channel Catfish	686.82	25.46	1469.93	17.93	2156.75	19.79
Flathead Catfish	42.70	1.58	3.78	0.05	46.48	0.43
Rock Bass	33.95	1.26	1173.24	14.31	1207.19	11.08
Any Sunfish	0.00	0.00	277.64	3.39	277.64	2.55
Redbreast Sunfish	22.63	0.84	113.43	1.38	136.06	1.25
Bluegill	50.47	1.87	34.05	0.42	84.52	0.78
Redear Sunfish	122.90	4.56	0.00	0.00	122.90	1.13
Smallmouth Bass	1093.81	40.55	3964.40	48.35	5058.21	46.42
Spotted Bass	145.53	5.39	102.15	1.25	247.68	2.27
Largemouth Bass	408.30	15.14	211.79	2.58	620.09	5.69
White Crappie	33.95	1.26	69.97	0.85	103.92	0.95
Black Crappie	56.59	2.10	0.00	0.00	56.59	0.52
Tangerine Darter	0.00	0.00	97.13	1.18	97.13	0.89
Sauger	0.00	0.00	90.73	1.11	90.73	0.83
Freshwater Drum	0.00	0.00	69.97	0.85	69.97	0.64

Angler Expenditures

In any recreational fishery the importance of the economic value of that fishery carries significance in terms of how anglers value the fishery and how it relates to the local economy. As part of our survey on the Nolichucky River we asked anglers how much they spent on there trip, which included fuel, bait, and any tackle they may have purchased the day of the trip. Based on our values generated from 375 interviews taken on the Nolichucky River it is estimated that anglers spent \$194,532.00 to fish the river between April and September. On a monthly basis, the greatest expenditures occurred during June when an estimated \$83,237.00 was spent to fish (Figure 6).

Figure 6. Angler expenditures by month for the Nolichucky River (upper, lower ,total) during 2006.



As part of our evaluation we were also interested in the value anglers put on specific species of fish or groups of fish they were trying to catch. Our expanded estimates for this facet of our survey indicated that anglers spent 34% of the total expenditure fishing

for smallmouth bass. Expenditures for smallmouth bass in the upper section of the river accounted for 32% of the total expenditures here, whereas anglers in the lower Nolichucky spent 46% of the total expenditures in the pursuit of smallmouth bass. Surprisingly, 40% of the total expenditure for the entire Nolichucky River was spent by anglers fishing for any species (Table 6).

Table 6. Expanded angler expenditures for the Nolichucky River during 2006. Estimates calculated for the median trip dollar value.

<i>Nolichucky River Upper</i>		
INTENDED SPECIES	FIXED DAILY EXPENDITURES	NUMBER OF INTERVIEWS
Any Catfish	\$15,601.03	36
Rainbow Trout	\$8,432.99	11
Any Sunfish	\$843.30	1
Any Black Bass	\$1,510.91	2
Smallmouth Bass (SMB)	\$42,446.03	84
Any Species	\$59,874.21	140
SMB and Catfish	\$1,827.15	2
SMB and Rainbow Trout	\$1,054.12	6
-----	-----	-----
TOTAL	\$131,589.73	

<i>Nolichucky River Lower</i>		
INTENDED SPECIES	FIXED DAILY EXPENDITURES	NUMBER OF INTERVIEWS
Any Catfish	\$3,977.75	17
Any Black Bass	\$5,469.41	4
Smallmouth Bass (SMB)	\$14,687.09	47
White Crappie	\$91.79	1
Any Species	\$6,119.62	19
SMB and Catfish	\$1,652.30	5
-----	-----	-----
TOTAL	\$31,997.96	

Angler State of Residence

Characterizing angler state of residence is important in determining local significance and destination popularity among the angling public. We were interested in capturing the state of residence of anglers using the Nolichucky River and determining how far people would travel to fish the river. As expected, most anglers fishing the Nolichucky were Tennessee residence (>90%). In the upper section of the river about 76% of the anglers resided in either Unicoi or Washington counties. In the lower Nolichucky most of the anglers (73%) were from Greene or Hamblen counties. Out-of-state anglers were represented most frequently from North Carolina (Table 7). On average anglers fishing the upper Nolichucky traveled 19 miles to fish as opposed to 18 miles for anglers fishing the lower section of the river.

Table 7. Distribution of state of origin for anglers who fished the Nolichucky River (upper and lower) during 2006.

<i>Nolichucky River Upper</i>				
<u>STATE</u>	<u>Frequency</u>	<u>Percent</u>	<u>Cumulative Frequency</u>	<u>Cumulative Percent</u>
TN	268	95.04	268	95.04
NC	9	3.19	277	98.23
VA	2	0.71	279	98.94
GA	1	0.35	280	99.29
NC GA FL	1	0.35	281	99.65
SC	1	0.35	282	100.00
<hr/>				
<i>Nolichucky River Lower</i>				
<u>STATE</u>	<u>Frequency</u>	<u>Percent</u>	<u>Cumulative Frequency</u>	<u>Cumulative Percent</u>
TN	88	94.62	88	94.62
AL	2	2.15	90	96.77
NC	1	1.08	91	97.85
SC	1	1.08	92	98.92
TN KY	1	1.08	93	100.00

Angler Opinion

In order to evaluate certain aspects regarding angler's opinions toward the management of the Nolichucky River, we asked some general questions pertaining to the Agency's management of rivers and more specifically attitudes concerning current smallmouth bass regulations. Based on the response to our questions, 83% of anglers fishing the Nolichucky River believed TWRA was doing a very good to excellent job in managing warm water rivers in the region (Table 8). Only 2% of anglers felt as if TWRA poorly managed rivers in east Tennessee.

Table 8. Distribution of responses from Nolichucky River anglers (upper and lower) asked the opinion question "how well do you feel TWRA is managing warm water streams?"

<i>Nolichucky River Upper</i>		
<u>Rating</u>	<u>Frequency</u>	<u>Percent</u>
1 POOR	7	2.48
2 FAIR	4	1.42
3 GOOD	35	12.41
4 VERY GOOD	104	36.88
5 EXCELLENT	132	46.81
<hr/>		
<i>Nolichucky River Lower</i>		
<u>Rating</u>	<u>Frequency</u>	<u>Percent</u>
1 POOR	1	1.08
2 FAIR	0	0.00
3 GOOD	18	19.35
4 VERY GOOD	50	53.76
5 EXCELLENT	24	25.81

In regards to the current smallmouth bass regulation on the Nolichucky, about 79% of the anglers interviewed supported the current five bass creel limit and no size limit. The

majority of the remaining 11% of anglers were in favor of a minimum length limit or slot limit.

Angler Affiliation with Organized Fishing Groups

Given the popularity of sport fishing in the region, we were interested in gathering information about how anglers extended their involvement in fishing to activities associated with organizations that focus efforts on fishing and water quality related issues. To get at this, we asked anglers if they belonged to any formal fishing organizations. Based on the responses from Nolichucky River anglers, only 9% said they were involved with an organized group that focused its efforts on fishing related activities.

Management Recommendations

1. Continue monitoring surveys on a 3 year rotation.
2. Develop a fishery management plan for the river.
3. Cooperate with the local watershed organization to protect and enhance the river and its tributaries.
4. Continue work to secure river access.
5. Investigate techniques for rearing and reintroducing blue sucker above Davy Crockett Dam.

Pigeon River

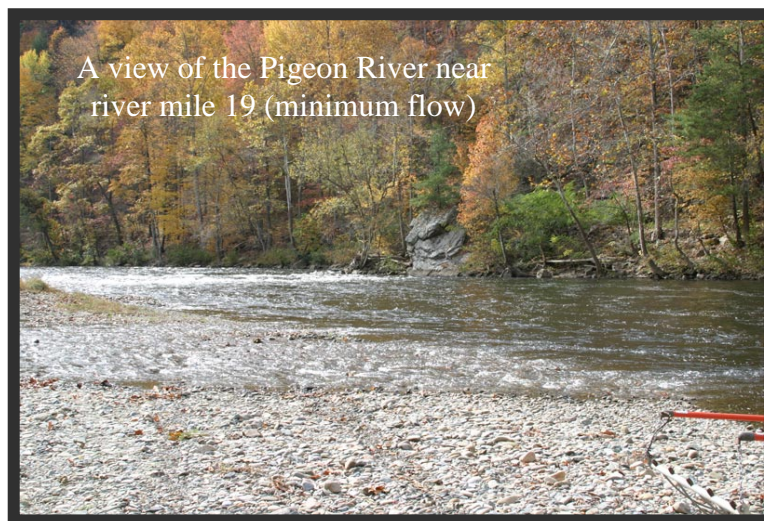
Introduction

The Pigeon River has had a long history of pollution problems, stemming primarily from the 80 plus-year discharge of wastewater from the Champion Paper Mill in Canton, North Carolina. This discharge has undoubtedly had a profound effect on the recreational use of the river and after the discovery of elevated dioxin levels in the 1980's raised concerns about public health (TDEC 1996). Although the river has received increased attention in recent years, the recreational use of the river has not developed its full potential. In terms of the fishery, consumption of all fish was prohibited up until 1996 when the ordinance was downgraded, limiting consumption of carp, catfish, and redbreast sunfish (TDEC 1996). In 2003, all consumption advisories were removed from the river. Since 1988, inter-agency Index of Biotic Integrity samples have been conducted at two localities near river mile 8.2 (Tannery Island) and river mile 16.6 (Denton).

Our 2006 surveys focused on continuing our collection of catch effort data for black bass and rock bass and assisting with evaluating the fish community at two long-term IBI stations. Catch effort data along with otolith samples from rock bass and black bass were collected from three sites in 1997 (Bivens et al. 1998) and five sites in 1998 (Carter et al. 1999). Since 1999, data has been collected at five to six sites between river mile 4.0 and 20.5 (Carter et al. 2000, 2001, 2002, 2003, 2004). During 1998, a 508 mm minimum (20-inch) length limit on smallmouth bass with a one fish possession limit was passed by the Tennessee Wildlife Resources Commission (TWRC). This regulation was implemented on March 1, 1999.

Study Area and Methods

The Pigeon River originates in North Carolina and flows in a northwesterly direction before emptying into the French



A view of the Pigeon River near river mile 19 (minimum flow)

Broad River near river mile 73.8. The river has a drainage area of approximately 1,784 km² at its confluence with the French Broad River. In Tennessee, approximately 35 kilometers of the Pigeon River flows through mountainous terrain with interspersed communities and small farms before joining the French Broad River near Newport. Public access along the river is primarily limited to bridge

crossings and small “pull-outs” along roads paralleling the river. There are a few primitive launching areas for canoes or small boats and one moderately developed launch at Denton. Between April and October, 2006, we conducted seven fish surveys at five sites between

Newport and Waterville Dam and characterized angler use and harvest through a roving creel census (Figure 7). We were unable to complete one of our CPUE survey sites (site 2) due to flood damage at this location. Our historical access to the river had all but been obliterated from a flood that hit the watershed in late summer 2004. Because this portion of the river is a tailwater, habitat availability fluctuates with water releases. However, in our survey sites during low flow, the habitat consisted primarily of wooded shorelines with interspersed rock outcroppings. Submerged woody debris was fairly common in most of our sample areas. The river substrate was predominately boulder/cobble in riffle areas and bedrock with interspersed boulder/cobble in the pool areas. Measured channel widths ranged from 35.3 to 64.3 m, while site lengths fell between 80 and 839 m (Table 7). Water temperatures ranged from 11.5 to 13 C and conductivity varied from 118 to 149 $\mu\text{s}/\text{cm}$ (Table 7).

Figure 7. Site locations for samples conducted in the Pigeon River during 2006.

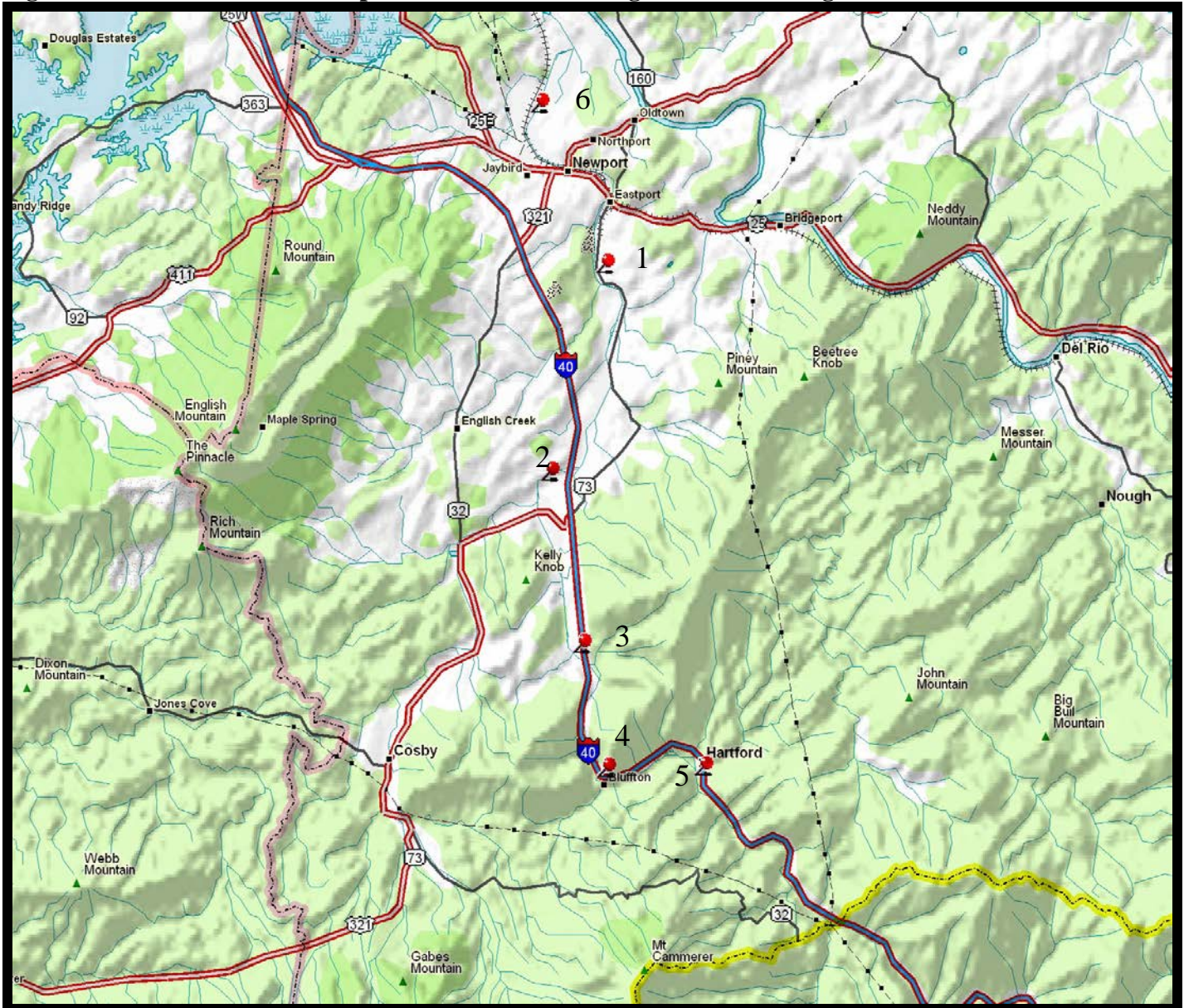


Table 7. Physiochemical and site location data for CPUE samples conducted in the Pigeon River during 2006.

Site Code	Site	County	Quad	River Mile	Latitude	Longitude	Mean Width (m)	Length (m)	Temp. C	Cond.	Secchi (m)
420060601	1	Cocke	Newport 173NW	8.1	35.94250	-83.17860	53.6	392	13	149	2.5
420060602	No Sample						-	-	-	-	-
420060603	3	Cocke	Hartford 173SW	16.6	35.84410	-83.18440	-	414	12	120	2.5
420060604	4	Cocke	Hartford 173SW	19	35.81300	-83.17800	35.3	80	12.5	118	2.5
420060605	5	Cocke	Hartford 173SW	20.5	35.81360	-83.16250	47.3	839	11.5	120	2.5
420060606	6	Cocke	Newport 173NW	4.0	35.98250	-83.19880	54	193	13	149	2.5

Catch-per-unit-effort fish samples were collected by boat electrofishing in accordance with the standard large river sampling protocols (TWRA 1998). Fixed-boom electrodes were used to transfer 4-5 amps DC at all sites. This current setting was determined effective in narcotizing all target species (black bass and rock bass). All fish collected were returned to the river. Additionally, efforts were made to identify non-target species encountered at each survey site. All sites were sampled during daylight hours and had survey durations ranging from 989 to 2,495 seconds. Catch-per-unit-effort values were calculated for each target species at each site. Length categorization indices were calculated for target species following Gabelhouse (1984). Index of Biotic Integrity samples were collected using both backpack and boat electrofishing in accordance with standardized protocols.

Results

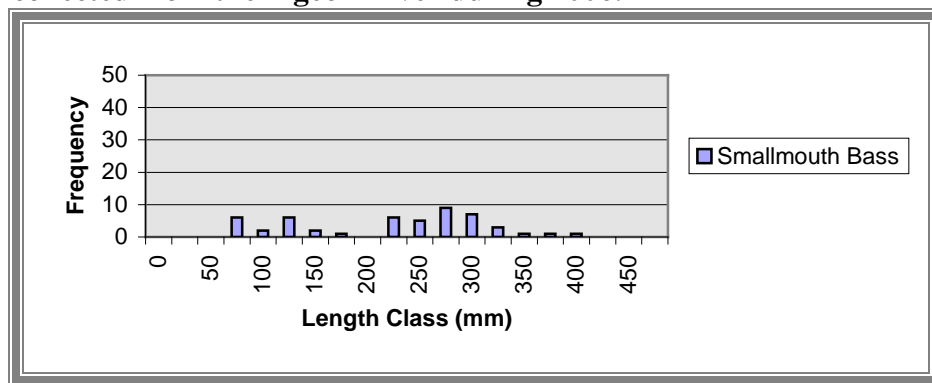
During our surveys, smallmouth bass and rock bass were collected from all sample sites with the exception of site 6. Spotted bass were not collected at any of the sampling stations. Largemouth bass were present at site 1, 5 and 6. Smallmouth bass was the most abundant black bass species at any of the survey sites. CPUE estimates for this species averaged 21.7/hour (SD 14.9) (Table 8). Our highest observed catches of smallmouth bass were recorded at site 3 (Denton) and site 1 (Tannery Island). Rock bass CPUE was highest in sites 1 and 3, averaging 14.2/hour (SD 12.4). The highest catch rate for this species was recorded at site 3 (32.5/hour), which also had the highest value in 2005. Overall, we observed a 64.5% decrease in the mean catch rate of smallmouth bass between the 2004 and 2006 samples. Although speculated in 2005 that the water temperature had not decreased enough to move bass into our sample areas, we feel our 2006 survey was conducted during an optimal time when bass should have moved into our sample areas. Therefore, we believe that both samples are probably reflective of the current trend in the river and are artifacts of the flooding that occurred in the river in 2004. The most surprising finding we had during this survey was the high catch of quality rainbow trout.

Table 8. Catch per unit effort and length categorization indices of target species collected at five sites on the Pigeon River during 2006.

Site Code	Smallmouth Bass CPUE	Spotted Bass CPUE	Largemouth Bass CPUE	Rock Bass CPUE	Rainbow Trout CPUE
420060601	22.7	0	4.5	18.2	0
420060602	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
420060603	42.2	0	0	32.5	6.6
420060604	22.2	0	0	14.8	22.2
420060605	21.7	0	1.4	5.8	2.9
420060606	0	0	3.7	0	0
MEAN	21.7	0	1.9	14.2	6.3
STD. DEV.	14.9	0	2.1	12.4	9.2
	Smallmouth Bass Length- Categorization Analysis	Spotted Bass Length- Categorization Analysis	Largemouth Bass Length- Categorization Analysis	Rock Bass Length- Categorization Analysis	Rainbow Trout Length- Categorization Analysis
	PSD = 58.8	PSD = 0	PSD = 0	PSD = 28	PSD = 27.3
	RSD-Preferred = 8.8	RSD-Preferred = 0	RSD-Preferred = 0	RSD-Preferred = 0	RSD-Preferred = 0
	RSD-Memorable = 0	RSD-Memorable = 0	RSD-Memorable = 0	RSD-Memorable = 0	RSD-Memorable = 0
	RSD-Trophy = 0	RSD-Trophy = 0	RSD-Trophy = 0	RSD-Trophy = 0	RSD-Trophy = 0

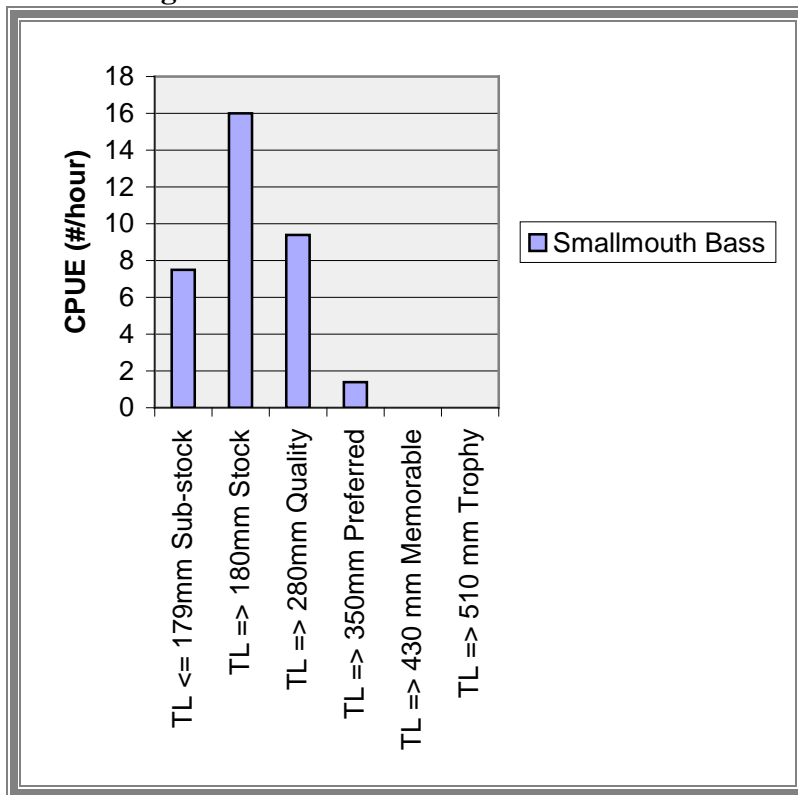
The majority of the smallmouth bass collected from the Pigeon River during 2006 fell within the 125 to 250 mm length range (Figure 8). Our data indicated that bass less than 100 mm were not completely vulnerable to the sampling gear, although juvenile fish were represented in the 2006 samples. Length categorization analysis indicated the Relative Stock Density (RSD) for preferred smallmouth bass ($TL \geq 350$ mm) was 8.8,

Figure 8. Length frequency distribution for smallmouth bass collected from the Pigeon River during 2006.



which was down 59% from the previous year. RSD for memorable ($TL \geq 430$ mm) and trophy ($TL \geq 510$ mm) size bass were 0 and 0, respectively. The PSD of smallmouth bass (ratio of quality size bass to stock size bass) was 58.8. Catch per unit effort estimates by RSD category indicated smallmouth bass had the highest catch rates of any of the black bass species collected for the category RSD-S and above (Figure 9). The catch in both stock and quality categories remained relatively constant when compared to 2005. However, we did notice decreases in the other categories, most notably in preferred and memorable.

Figure 9. Relative stock density (RSD) catch per unit effort for smallmouth bass collected from the Pigeon River during 2006.



There were no spotted bass collected from the Pigeon River in 2006 (2 collected in 2004, 0 in 2005). Because no spotted bass were collected in the sample, no useful information could be derived regarding the size structure of this species.

Only four largemouth bass were collected from all of our sites surveyed in 2006. Largemouth bass have always been a rarity at all of our sample stations and it is not unexpected to survey all sample stations without observing this species. The largemouth collected in 2006 ranged in length from 82 to 239 mm.

Individuals in the 150 to 175 mm range represented the majority of rock bass in our sample (Figure 10). Length categorization analysis indicated the RSD for preferred rock bass ($TL \geq 230$ mm) was 0 which was a decline from 2.9 in 2005. RSD for memorable ($TL \geq 280$ mm) and trophy ($TL \geq 330$ mm) size rock bass was 0. The PSD of rock bass was 28, which was an increase from the 2005 value of 23.8. Catch per unit effort estimates by RSD category indicated the majority of our catch was stock size fish (Figure 11) with about 24% of the catch representing quality size fish. Unlike 2005, we did not observe any rock bass in the preferred category although we did see a slight increase in the number of sub-stock fish.

Figure 10. Length frequency distribution for rock bass collected from the Pigeon River during 2006.

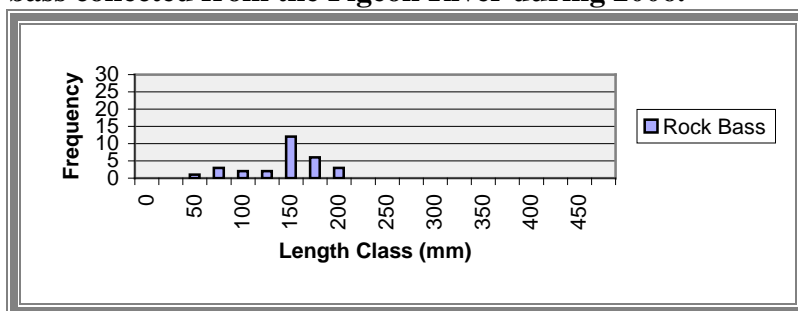
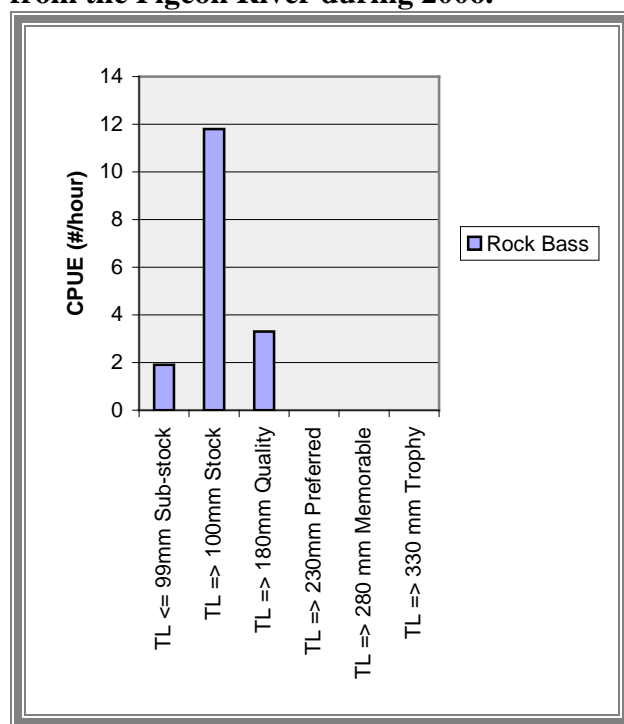


Figure 11. Relative stock density (RSD) catch per unit effort by category for rock bass collected from the Pigeon River during 2006.



Linear and curvilinear length-weight regression analysis has been calculated for previous data (Carter et al. 1999, 2000), and is assumed to be similar for the 2006 data. No age and growth data was collected from this population in 2005; age and growth characteristics for rock bass in the Pigeon River are well documented from recent surveys (Carter et al. 1999, 2000).

The occurrence of rainbow trout in the Pigeon River has been documented sporadically since intensive survey efforts were initiated in 1997. Although occurring primarily in the upstream reaches (river mile 16 and above), we have documented rainbow trout at river mile 4 near Newport. In 2006, we observed the highest number (11) of rainbow trout from our long term monitoring stations since their establishment in 1997. During our angler survey of the Pigeon River we observed several instances where anglers had caught rainbow trout during their fishing trip. Based on reporting anglers

most of the rainbow trout caught in the Pigeon River were caught in the spring and most anglers who caught rainbow trout were fishing in the upper half of the river. Most of the rainbow trout we observed in 2006 were quality fish ranging in length 247 mm to 433 mm. Almost all of the fish we observed appeared to be in good condition with excellent coloration. The mean CPUE for rainbow trout was 6.3 (SD 9.2) with all occurrences above river mile 16. We did observe two specimens that were recent hatchery introductions at our Denton site (river mile 16.6). These fish, if stocked by TWRA, would have come from releases made in Cosby Creek which enters the Pigeon approximately 3 miles downstream.



During 2001 we had a sample of black bass and rock bass tested for disease by the U.S. Fish and Wildlife Service as part of the wild fish health survey. We were primarily interested in determining if there was a high incidence of disease among these species due to prolonged exposure to pollutants in the river. We were also interested in screening largemouth bass for largemouth bass virus (LMBV), which has been identified in selected Tennessee reservoir populations. Our sample from the Pigeon River in 2001 did not indicate any disease commonly associated with the species tested.

Several other species were collected or observed during our cooperative IBI surveys at Tannery Island (37 species observed) and Denton (28 species observed). None of the fish collected in the 2006 sample were listed by the U.S. Fish and Wildlife Service or the TWRA as threatened or endangered although we did collect a brown bullhead (*Ameiurus nebulosus*) at river mile 16.6 in the October sample. A list of species occurrence at these two sites can be found in Table 9.

Table 9. Distribution of fish species collected in the Pigeon River during 2006.

Pigeon River Mile	8.1	Number Collected	16.6	Number Collected
	420060601		420060603	
	<i>Ambloplites rupestris</i>	22	<i>Ambloplites rupestris</i>	45
	<i>Ameiurus natalis</i>	2	<i>Aplodinotus grunniens</i>	1
	<i>Campostoma oligolepis</i>	53	<i>Campostoma oligolepis</i>	116
	<i>Carpionodes cyprinus</i>	1	<i>Cottus carolinae</i>	119
	<i>Cottus carolinae</i>	30	<i>Cyprinella galactura</i>	161
	<i>Cyprinella galactura</i>	318	<i>Dorosoma cepedianum</i>	76
	<i>Cyprinella spiloptera</i>	76	<i>Etheostoma blennioides</i>	27
	<i>Cyprinus carpio</i>	1	<i>Etheostoma camurum</i>	1
	<i>Dorosoma cepedianum</i>	53	<i>Etheostoma rufilineatum</i>	320
	<i>Etheostoma blennioides</i>	21	<i>Etheostoma tennesseense</i>	9
	<i>Etheostoma kennicotti</i>	8	<i>Hybrid lepomis spp.</i>	3
	<i>Etheostoma rufilineatum</i>	48	<i>Hypentelium nigricans</i>	40
	<i>Etheostoma tennesseense</i>	31	<i>Ichthyomyzon bdellium</i>	9
	<i>Gambusia affinis</i>	3	<i>Ictalurus punctatus</i>	2
	<i>Hybopsis amblops</i>	3	<i>Lepomis auritus</i>	8
	<i>Hypentelium nigricans</i>	25	<i>Lepomis cyanellus</i>	1
	<i>Ichthyomyzon bdellium</i>	3	<i>Lepomis macrochirus</i>	4
	<i>Ichthyomyzon sp.</i>	1	<i>Micropterus dolomieu</i>	45
	<i>Ictalurus punctatus</i>	3	<i>Micropterus punctulatus</i>	1
	<i>Ictiobus bubalus</i>	3	<i>Moxostoma carinatum</i>	3
	<i>Ictiobus niger</i>	3	<i>Moxostoma duquesnei</i>	23
	<i>Lepomis auritus</i>	14	<i>Moxostoma breviceps</i>	1
	<i>Lepomis cyanellus</i>	12	<i>Hybopsis amblops</i>	5
	<i>Lepomis macrochirus</i>	16	<i>Notropis photogenis</i>	76
	<i>Micropterus dolomieu</i>	10	<i>Notropis telescopus</i>	98
	<i>Micropterus punctulatus</i>	1	<i>Oncorhynchus mykiss</i>	1
	<i>Micropterus salmoides</i>	25	<i>Percina caprodes</i>	6
	<i>Moxostoma anisurum</i>	1	<i>Percina evides</i>	3
	<i>Moxostoma breviceps</i>	1	<i>Sander vitreum</i>	2
	<i>Moxostoma carinatum</i>	5		
	<i>Moxostoma duquesnei</i>	17		
	<i>Moxostoma erythrurum</i>	4		
	<i>Notropis photogenis</i>	1		
	<i>Notropis rubellus</i>	196		
	<i>Noturus eleutherus</i>	2		
	<i>Percina caprodes</i>	7		
	<i>Percina evides</i>	1		
	<i>Sander vitreum</i>	2		

Benthic macroinvertebrates collected at the Tannery Island site comprised 29 families representing 29 identified genera (Table 10). The most abundant group in our collection was the caddisflies comprising 35.5% of the total sample. Overall, a total of 38 taxa were identified from the sample of which 10 were EPT. Based on the EPT taxa richness and overall biotic index of all species collected, the relative health of the benthic community was classified as “fair/good” (3.5).

Table 10. Taxa list and associated biotic statistics for benthic macroinvertebrates collected from the Pigeon River at Tannery Island (river mile 8.1).

ORDER	FAMILY	SPECIES	NUMBER	PERCENT
AMPHIPODA				1.2
	Crangonyctidae		3	
ANNELIDA				7.9
	Hirudinea		7	
	Oligochaeta		12	
COLEOPTERA				3.3
	Elmidae	<i>Ancyronyx variegatus</i> adult	1	
		<i>Macronychus glabratus</i> adults & larva	5	
		<i>Promoresia elegans</i> adult	1	
	Gyrinidae	<i>Dineutus discolor</i> female	1	
DECAPODA				1.2
	Cambaridae	<i>Orconectes virilis</i> juveniles	3	
DIPTERA				11.6
	Chironomidae		26	
	Simuliidae		2	
EPEHEMEROPTERA				3.7
	Baetidae	<i>Baetis</i>	6	
	Heptageniidae	<i>Maccaffertium mediopunctatum</i>	3	
GASTROPODA				11.6
	Ancylidae	<i>Ferrissia</i>	3	
	Physidae		11	
	Pleuroceridae	<i>Leptoxis</i>	4	
		<i>Pleurocera</i>	10	
HETEROPTERA				0.8
	Belostomatidae	<i>Belostoma flumineum</i>	1	
	Veliidae	<i>Rhagovelia obesa</i> male	1	
				0.8
HYDRACARINA			2	
ISOPODA				6.6
	Asellidae	<i>Caecidotea</i>	16	
MEGALOPTERA				3.3
	Cordalidae	<i>Corydalus cornutus</i>	8	
ODONATA				8.3
	Aeshnidae	<i>Boyeria vinosa</i>	3	
	Calopterygidae	<i>Hetaerina americana</i>	4	
	Coenagrionidae	<i>Anomalagrion/ischnura</i>	1	
		<i>Argia</i>	7	
	Corduliidae	<i>Neurocordulia obsoleta</i>	1	
	Gomphidae	<i>Hagenius brevistylus</i>	2	
	Macromiidae	<i>Macromia</i>	2	
PELECYPODA				2.9
	Corbiculidae	<i>Corbicula fluminea</i>	7	
TRICHOPTERA				35.5
	Brachycentridae	<i>Brachycentrus lateralis</i>	6	
		<i>Brachycentrus numerosus</i>	4	
	Hydropsychidae	<i>Ceratopsyche morosa</i> larvae & pupa	11	
		<i>Cheumatopsyche</i>	53	
	Hydroptilidae	<i>Hydroptila</i>	4	
		<i>Leucotrichia pictipes</i>	1	
	Lepidostomatidae	<i>Lepidostoma</i>	5	
	Polycentropodidae	<i>Neureclipsis crepuscularis</i>	2	
TURBELLARIA			3	1.2
Total			242	

TAXA RICHNESS = 38

EPT TAXA RICHNESS = 10

BIOCLASSIFICATION = 3.5 (FAIR/GOOD)

Benthic macroinvertebrates collected at the Denton site comprised 27 families representing 27 identified genera (Table 11). The most abundant group in our collection was the mayflies comprising 39.4% of the total sample. Overall, a total of 33 taxa were

identified from the sample of which 16 were EPT. Based on the EPT taxa richness and overall biotic index of all species collected, the relative health of the benthic community was classified as “fair-good/good” (3.8).

Table 11. Taxa list and associated biotic statistics for benthic macroinvertebrates collected from the Pigeon River at Denton (river mile 16.6).

ORDER	FAMILY	SPECIES	NUMBER	PERCENT
AMPHIPODA				1.0
	Crangonyctidae		2	
ANNELIDA				1.0
	Oligochaeta		2	
COLEOPTERA				3.5
	Dryopidae	<i>Helichus</i> adults	2	
	Elmidae	<i>Promoresia elegans</i> larva & adult	2	
	Gyrinidae	<i>Dineutus discolor</i> adult females	2	
		<i>Dineutus</i> larva	1	
DIPTERA				8.1
	Chironomidae		13	
	Simuliidae		3	
EPHEMEROPTERA				39.4
	Baetidae	<i>Baetis</i>	21	
	Caenidae	<i>Caenis</i>	1	
	Ephemerellidae	<i>Serratella</i>	2	
	Heptageniidae	<i>Maccaffertium</i> early instars	20	
		<i>Maccaffertium ithaca</i>	15	
	Isonychiidae	<i>Isonychia</i>	19	
GASTROPODA				1.0
	Pleuroceridae	<i>Leptoxis</i>	2	
HETEROPTERA				1.0
	Veliidae	<i>Rhagovelia obesa</i> male & female	2	
ISOPODA				0.5
	Asellidae	<i>Caecidotea</i>	1	
MEGALOPTERA				4.5
	Corydalidae	<i>Corydalis cornutus</i>	7	
		<i>Nigronia serricornis</i>	2	
ODONATA				7.6
	Aeshnidae	<i>Boyeria vinosa</i>	3	
	Coenagrionidae	<i>Argia</i>	3	
	Corduliidae	<i>Neurocordulia obsoleta</i>	1	
	Macromiidae	<i>Macromia</i>	8	
PELECYPODA				1.0
	Corbiculidae	<i>Corbicula fluminea</i>	2	
PLECOPTERA				1.0
	Perlidae	<i>Acroneuria abnormis</i>	2	
TRICHOPTERA				30.3
	Brachycentridae	<i>Brachycentrus lateralis</i>	4	
	Hydropsychidae	<i>Ceratopsyche morosa</i>	29	
		<i>Ceratopsyche sparna</i>	7	
		<i>Cheumatopsyche</i>	7	
		<i>Hydropsyche franclemonti</i>	7	
		<i>Hydropsyche venularis</i>	2	
	Hydroptilidae	<i>Hydroptila</i>	1	
		<i>Leucotrichia pictipes</i> pupa	1	
	Leptoceridae	<i>Oecetis</i> early instar	1	
	Polycentropodidae	<i>Polycentropus</i>	1	
Total			198	

TAXA RICHNESS = 33

EPT TAXA RICHNESS = 16

BIOCLASSIFICATION = 3.8 FAIR/GOOD-GOOD

In light of the recent fish and invertebrate kills observed during 2006, an additional benthic survey was conducted upstream of the point source pollution near the Hwy. 73 bridge crossing. This was done in an attempt to characterize perceived impacts observed at the Tannery Island station. Benthic macroinvertebrates collected at this site comprised

24 families representing 32 identified genera (Table 12). The most abundant group in our collection was the mayflies comprising 32.5% of the total sample. Overall, a total of 33 taxa were identified from the sample of which 16 were EPT. Based on the EPT taxa richness and overall biotic index of all species collected, the relative health of the benthic community was classified as “good” (4.2).

Table 12. Taxa list and associated biotic statistics for benthic macroinvertebrates collected from the Pigeon River at the Hwy. 73 bridge crossing.

ORDER	FAMILY	SPECIES	NUMBER	PERCENT
AMPHIPODA				1.7
	Gammaridae	<i>Gammarus</i>	4	
ANNELIDA				1.3
	Oligochaeta		3	
COLEOPTERA				8.1
	Dryopidae	<i>Helichus</i>	1	
	Elmidae	<i>Macronychus glabratus</i>	2	
		<i>Microcylleopus pusillus</i>	8	
		<i>Promoresia elegans</i> larvae	4	
	Gyrinidae	<i>Dineutus discolor</i> male and females	4	
DIPTERA				6.0
	Athericidae	<i>Atherix lantha</i>	1	
	Chironomidae		4	
	Simuliidae		9	
EPHEMEROPTERA				32.5
	Baetidae	<i>Acentrella</i>	1	
		<i>Baetis</i>	14	
		<i>Heterocloeon</i>	4	
		Undetermined	6	
	Ephemerellidae	<i>Ephemerella</i>	1	
		<i>Serratella</i>	7	
	Heptageniidae	<i>Heptagenia</i>	1	
		<i>Leucrocota</i>	3	
		<i>Maccaffertium</i> early instars	4	
		<i>Maccaffertium mediopunctatum</i>	22	
		<i>Maccaffertium terminatum</i>	1	
		<i>Stenacron carolina</i>	3	
	Isonychiidae	<i>Isonychia</i>	8	
	Leptohyphidae	<i>Tricorythodes</i>	1	
HETEROPTERA				6.0
	Veliidae	<i>Rhagovelia obesa</i> nymph, males, & females	14	
ISOPODA				2.1
	Asellidae	<i>Caecidotea</i>	5	
MEGALOPTERA				2.1
	Corydalidae	<i>Corydalus cornutus</i>	4	
		<i>Nigronia serricornis</i>	1	
ODONATA				5.1
	Aeshnidae	<i>Boyeria vinosa</i>	12	
PELECYPODA				2.1
	Corbiculidae	<i>Corbicula fluminea</i>	5	
PLECOPTERA				0.9
	Perlidae	<i>Perlesta</i>	2	
TRICHOPTERA				30.3
	Brachycentridae	<i>Brachycentrus lateralis</i>	10	
		<i>Brachycentrus numerosus</i>	11	
	Hydropsychidae	<i>Ceratopsyche morosa</i>	31	
		<i>Ceratopsyche sparna</i>	5	
		<i>Cheumatopsyche</i>	8	
		<i>Hydropsyche franclemonti</i>	3	
	Hydroptilidae	<i>Leucotrichia pictipes</i>	1	
	Leptoceridae	<i>Triaenodes ignitus</i>	1	
	Polycentropodidae	<i>Polycentropus</i>	1	
TURBELLARIA			4	1.7
		Total	234	

TAXA RICHNESS = 39

EPT TAXA RICHNESS = 22

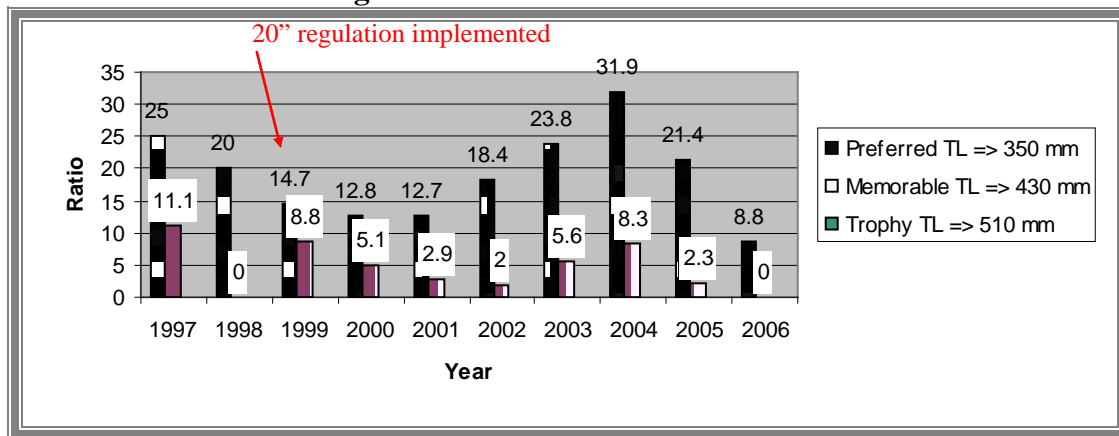
BIOCLASSIFICATION = 4.2 GOOD

The most notable difference between the Tannery Island station the one surveyed at Hwy. 73 was substantial disparity in mayfly abundance. Only 3.7% of sample at Tannery Island was comprised of mayflies compared to 32.5% at the Hwy. 73 site. This is strong evidence that the point source pollution (agricultural run-off) above Tannery Island did have an impact at this station. Additionally, no stoneflies were collected at Tannery Island. One genera of stonefly was collected at the Hwy. 73 site comprising 0.9% of the total sample.

Discussion

The Pigeon River provides anglers with the opportunity to catch all species of black bass as well as rock bass. Perhaps the greatest potential for elevating this river's "trophy" status lies in the smallmouth bass population. Given that a fair percentage of smallmouth bass are reaching the preferred category (average 18.9% between 1997-2006) and that these fish are growing slightly slower than the statewide average (Carter et al. 1999), there would appear to be good potential for trophy management of the smallmouth bass population in this river. During 2006, we recorded the lowest percentage of preferred smallmouth bass to date (Figure 12). Overall, the value decreased 59% from the previous year and was 53% lower than the ten year average. There was no memorable size bass collected in 2006, which only occurred in one other instance (1998) during the ten year time period.

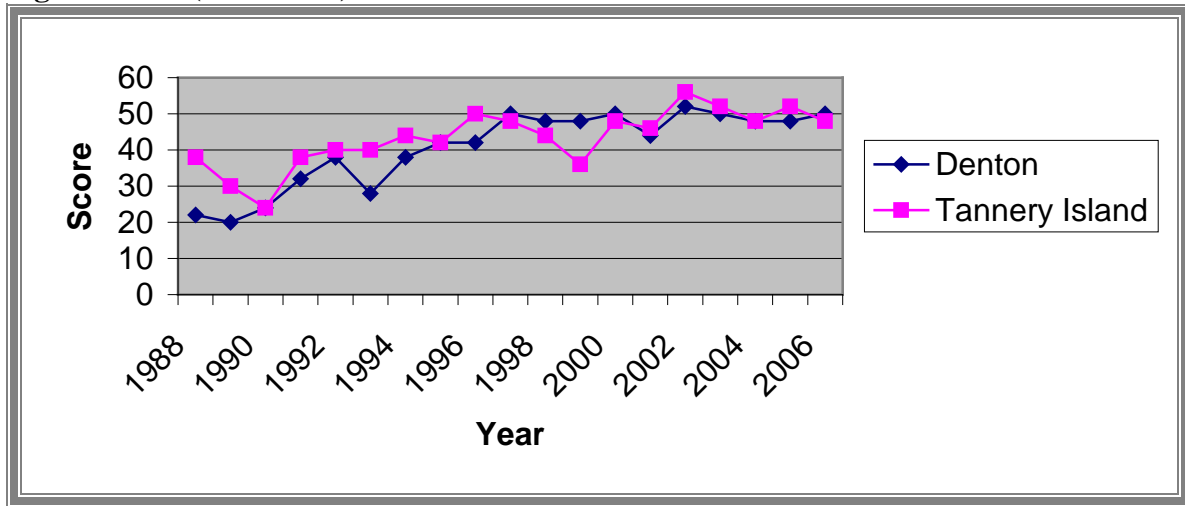
Figure 12. Trends in the ratio of preferred, memorable, and trophy smallmouth bass collected from the Pigeon River 1997-2006.



Over the last 19 years the IBI scores (TWRA and TVA data) at two stations on the Pigeon River have been steadily increasing (Figure 13). Results from the 2006 surveys indicated the Pigeon River was in good condition at river mile 8.1 (IBI score 48) and 16.5 (IBI score 50). This has primarily been the result of improved wastewater treatment at the Blue Ridge Paper Mill in Canton, North Carolina. The improved water quality has undoubtedly had an affect on the amount of recreation that is currently taking place, particularly whitewater rafting. It has also resulted in the return of a few species (e.g. silver shiner, telescope shiner) previously not encountered in the annual surveys and the implementation of a fish and mollusk recovery effort. During 2006, there were at least two instances of pesticides entering the river. During these events, both benthic invertebrates and fish were killed. Investigations by TWRA and TDEC resulted in

identifying the areas of agricultural runoff into the river. A remediation plan to control the runoff of agricultural pesticides is being developed by TDEC and TWRA.

Figure 13. Trends in Index of Biotic Integrity (IBI) at two stations on the Pigeon River (1988-2006).



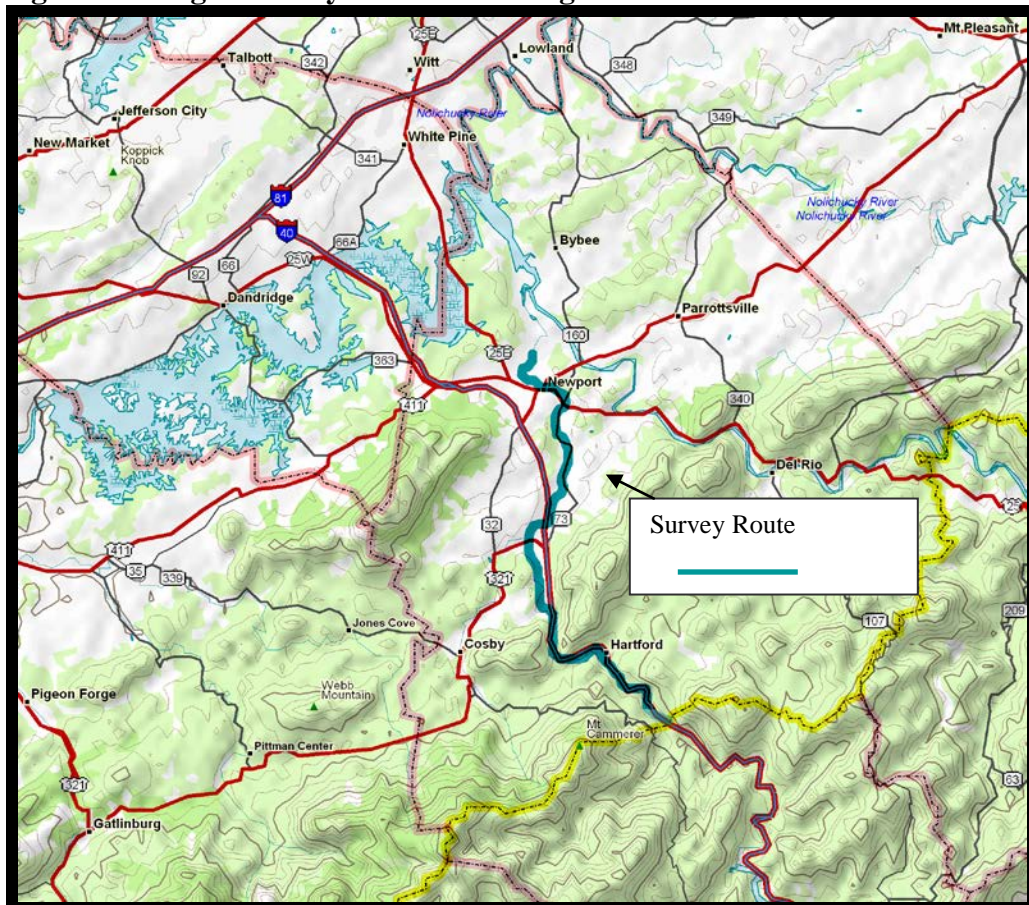
We will monitor black bass and rock bass populations in the Pigeon River during late September or October in order to increase our efficiency in characterizing the smallmouth bass populations in the river. We will continue to monitor the Pigeon River; however, it will occur on a less frequent schedule. The next scheduled sample for black bass and rock bass will be in 2009. IBI samples will continue on an annual basis.

Characterizing Angler Use of the Pigeon River Fishery

Introduction

The lack of quantitative angler use and harvest data on the Region's more popular river sport fisheries has been a missing component in fully evaluating these fisheries and how they are utilized. Until 2001 angler use data on east Tennessee warm water rivers was non-existent. The North Fork Holston River was surveyed in 2001 under contract with Tennessee Tech. University (Betolli 2002). During 2006, the regional stream survey unit collected angler use information on the Pigeon River between April 1 and September 30. A statistically valid roving creel survey was generated for the river and days (week or weekend) and survey shifts (a.m. or p.m.) were assigned from the survey model. The average number of daylight hours during each month was used to determine survey workdays, which was divided into a.m. (dawn to 1300) and p.m. shifts (1300 to sunset). Probabilities for a.m. and p.m. shifts were 40% and 60%, respectively. Sample days were chosen at random. Surveyors would follow a predetermined route (Figure 14) on the river and collected angler information during the specified survey period. A mail-in survey form was left on vehicles where anglers could not be interviewed.

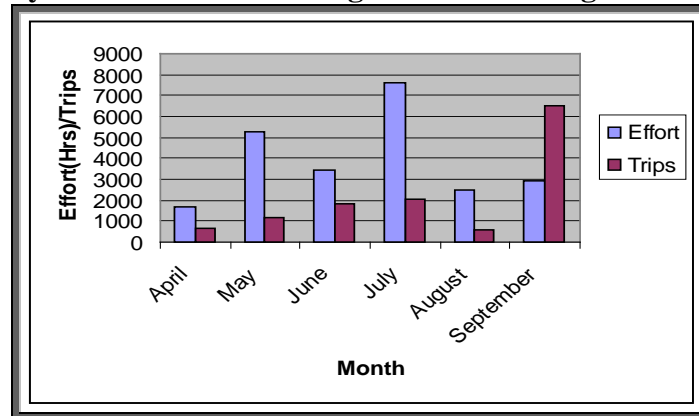
Figure 14. Angler survey route for the Pigeon River.



Angler Effort

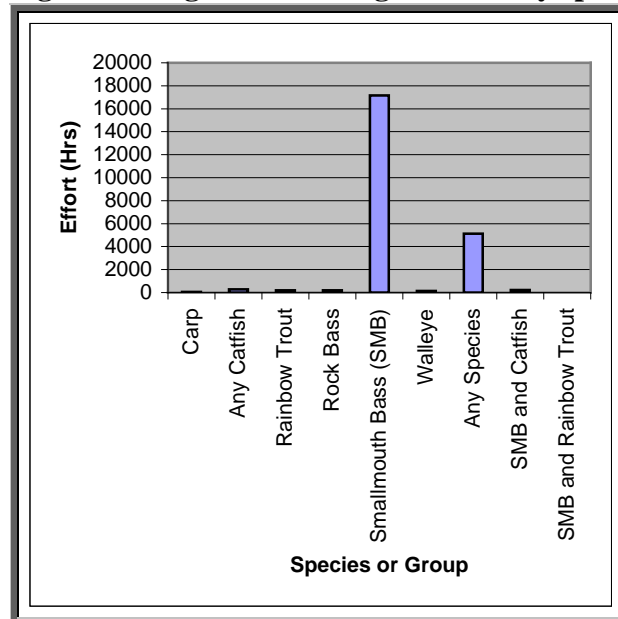
Angling effort for the Pigeon River was recorded in hours. Estimates of the actual number of recorded fishing hours were made by month, the entire sampling period (April-September), and by species fished for (hours spent targeting specific species). A total of 23,393 angler effort hours were expended during the 2006 survey period. The highest effort (Figure 15) was observed in July (7,632 hours) followed by the month of May (5,277 hours). A total of 12,818 trips were made to the river during the survey period with an average trip length of 1.8 hours. The most trips recorded to the Pigeon were in September (Figure 15) although the average trip length was only 45 minutes.

Figure 15. Angler effort (hours) and total number of trips by month taken to the Pigeon River during 2006.



As expected, anglers expended the most effort exclusively in pursuit of smallmouth bass (17,169 hours). Those anglers fishing for any species recorded the second highest amount of effort followed by anglers fishing exclusively for catfish (Figure 16).

Figure 16. Pigeon River angler effort by species.



Angler Catch, Harvest, and Release

Based on the anglers interviews collected during 2006, an estimated total of 23,133 fish were caught between April and September. Of this number, 83% were released and 17% harvested. No smallmouth bass were harvested although 6,811 were caught and released. Based on the amount of effort expended on pursuing this species, about 0.97 smallmouth bass per hour were being caught by anglers (Table 13). Smallmouth bass was the most frequently caught species followed by walleye and rainbow trout (Table 14). Walleye was the most harvested species, accounting for 61% of the total fish harvest from the Pigeon River. Channel catfish had the second highest harvest rate accounting for about 20% of the fish taken from the river. Overall, it appears that three species (rainbow trout, walleye, and smallmouth bass) are fairly important components of the Pigeon River fishery as they comprised about 57% of the total catch.

Table 13. CPUE estimates based on catch of intended species for the Pigeon River.

INTENDED SPECIES	INTENDED CATCH		INTENDED HARVEST		INTENDED RELEASE	
	PER HOUR	RSE CATCH	PER HOUR	RSE HARVEST	PER HOUR	RSE RELEASE
Carp	0.00000	.	0.00000	.	0.00000	.
Any Catfish	0.09013	76.5252	0.00000	.	0.09013	76.5252
Rainbow Trout	0.00000	.	0.00000	.	0.00000	.
Rock Bass	2.09524	28.5714	2.09524	28.5714	0.00000	.
Smallmouth Bass (SMB)	0.97829	14.0142	0.00000	.	0.97829	14.0142
Walleye	0.65502	47.1616	0.65502	47.1616	0.00000	.
Any Species	0.48391	14.6116	0.09275	37.0467	0.39116	17.7140
SMB and Catfish	0.62112	44.7205	0.00000	.	0.62112	44.7205
SMB and Rainbow Trout	0.00000	.	0.00000	.	0.00000	.

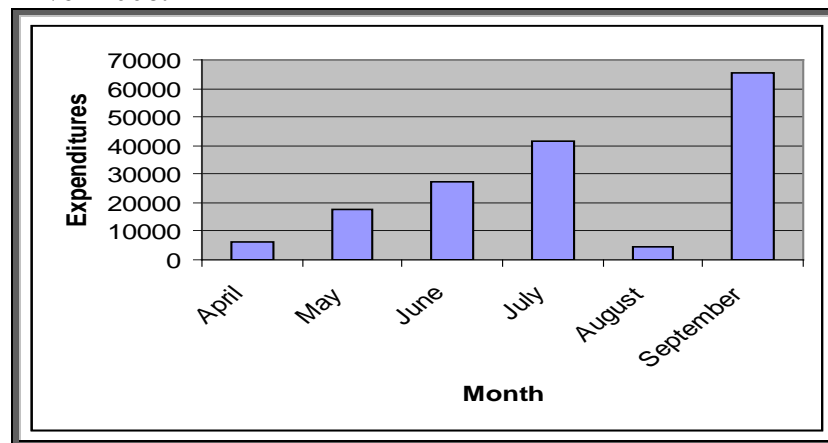
Table 14. Expanded species composition for the Pigeon River including the number of fish harvested, released, and caught.

SPECIES	PERCENT		PERCENT		PERCENT	
	NUMBER HARVESTED	COMP HARVEST	NUMBER RELEASED	COMP RELEASE	NUMBER CAUGHT	COMP CATCH
Carp	0.00	0.00	221.90	1.16	221.90	0.96
Smallmouth Buffalo	96.09	2.44	0.00	0.00	96.09	0.42
Redhorse spp.	0.00	0.00	20.13	0.10	20.13	0.09
Any Catfish	0.00	0.00	470.79	2.45	470.79	2.03
Channel Catfish	785.18	19.96	202.29	1.05	987.46	4.27
Rainbow Trout	0.00	0.00	3163.37	16.47	3163.37	13.67
White Bass	16.73	0.43	998.33	5.20	1015.06	4.39
Rock Bass	166.24	4.23	1991.95	10.37	2158.19	9.33
Any Sunfish	0.00	0.00	1423.92	7.42	1423.92	6.15
Redbreast Sunfish	0.00	0.00	248.38	1.29	248.38	1.07
Green Sunfish	0.00	0.00	107.95	0.56	107.95	0.47
Bluegill	0.00	0.00	415.97	2.17	415.97	1.80
Redear Sunfish	96.09	2.44	0.00	0.00	96.09	0.42
Smallmouth Bass	0.00	0.00	6810.95	35.47	6810.95	29.44
Spotted Bass	0.00	0.00	6.92	0.04	6.92	0.03
Largemouth Bass	0.00	0.00	590.53	3.08	590.53	2.55
White Crappie	0.00	0.00	26.99	0.14	26.99	0.12
Black Crappie	96.09	2.44	0.00	0.00	96.09	0.42
Logperch	0.00	0.00	26.99	0.14	26.99	0.12
Sauger	0.00	0.00	1244.87	6.48	1244.87	5.38
Walleye	2418.15	61.47	893.54	4.65	3311.70	14.31
Freshwater Drum	259.37	6.59	335.79	1.75	595.16	2.57

Angler Expenditures

In any recreational fishery the importance of the economic value of that fishery carries a lot of importance in terms of how anglers value the fishery and how it relates to the local economy. As part of our survey on the Pigeon River we asked anglers how much they spent on their trip, which included fuel, bait, and any tackle they may have purchased the day of the trip. Based on our values generated from 230 interviews taken on the Pigeon River it is estimated that anglers spent \$162,830.83 to fish the Pigeon River between April and September. On a monthly basis, the greatest expenditures occurred during September when an estimated \$65,327.78 was spent to fish (Figure 17). During July anglers spent nearly \$42,000.00 to fish the river.

Figure 17. Angler expenditures by month for the Pigeon River 2006.



As part of our evaluation we were also interested in the value anglers put on specific species of fish or groups of fish they were trying to catch. Our expanded estimates for this facet of our survey indicated that anglers spent 63% of the total expenditure fishing for smallmouth bass. This was followed by anglers who were fishing for any species (23% of total). Table 15 depicts the values expended by angler fishing for particular species, groups of species, or any species.

Table 15. Expanded angler expenditures for the Pigeon River during 2006. Estimates calculated for the median trip dollar value.

INTENDED SPECIES	FIXED DAILY EXPENDITURES	NUMBER OF INTERVIEWS
Carp	\$303.03	1
Any Catfish	\$8,181.80	17
Rainbow Trout	\$8,863.62	4
Rock Bass	\$1,454.54	2
Smallmouth Bass (SMB)	\$109,696.72	102
Walleye	\$181.82	2
Any Species	\$40,515.06	99
SMB and Catfish	\$3,409.08	2
SMB and Rainbow Trout	\$606.06	1
<hr/>		
RIVER	\$173,211.72	

Angler State of Residence

Characterizing angler state of residence is important in determining local significance and destination popularity among the angling public. We were interested in capturing the state of residence of anglers using the Pigeon River and determining how far people would travel to fish the river. As expected, most anglers fishing to Pigeon were Tennessee residence with about 77% of these anglers residing in Cocke County. Out-of-state anglers were represented most frequently by North Carolina residents followed by anglers from South Carolina (Table 16). On average anglers traveled 21.6 miles to fish the Pigeon River. The maximum distanced recorded for an angler fishing the Pigeon was 500 miles.

Table 16. Distribution of state of origin for anglers who fished the Pigeon River during 2006.

<u>STATE</u>	<u>Frequency</u>	<u>Percent</u>	<u>Cumulative Frequency</u>	<u>Cumulative Percent</u>
TN	207	90.00	207	90.00
NC	10	4.35	217	94.35
SC	3	1.30	220	95.65
FL	2	0.87	222	96.52
KY	2	0.87	224	97.39
TX	2	0.87	226	98.26
CT	1	0.43	227	98.70
GA AL	1	0.43	228	99.13
IL	1	0.43	229	99.57
VA AL	1	0.43	230	100.00

Angler Opinion

In order to evaluate certain aspects regarding angler's opinions toward the management of the Pigeon River, we asked some general questions pertaining to the Agency's management of rivers and more specifically attitudes concerning current smallmouth bass regulations. Based on the response to our questions, 82% of anglers fishing the Pigeon River felt like TWRA was doing a very good to excellent job in managing warm water rivers in the region (Table 17). Only 1.3% of anglers felt as if TWRA poorly managed rivers in east Tennessee.

Table 17. Distribution of responses from Pigeon River anglers asked the opinion question "how well do you feel TWRA is managing warm water streams?"

<u>Rating</u>	<u>Frequency</u>	<u>Percent</u>
1 POOR	3	1.30
2 FAIR	6	2.61
3 GOOD	32	13.91
4 VERY GOOD	120	52.17
5 EXCELLENT	69	30.00

DISTRIBUTION OF RESPONSES TO OPINION QUESTION 1:
"HOW WELL DO YOU FEEL THE TWRA IS MANAGING WARMWATER STREAMS?"

In regards to the current smallmouth bass regulations, about 93% of the anglers interviewed supported the current 20 inch minimum length limit and one fish creel limit on the Pigeon River.

Angler Affiliation with Organized Fishing Groups

Given the popularity of sport fishing in the region, we were interested in gathering information about how anglers extend their involvement in fishing to activities associated with organizations that focus efforts on fishing and water quality related issues. To get at this, we asked anglers if they belonged to any formal fishing organizations. Based on the responses from Pigeon River anglers, only 7% said they were involved with an organized group that focused its efforts on fishing related activities.

Management Recommendations

1. Continue monitoring the sport fish population every three years.
2. Continue the cooperative IBI surveys at the two established stations (Denton and Tannery Island).
3. Develop a management plan for the river.
4. Continue cooperative efforts to reintroduce common species.
5. Closely monitor black fly control program proposed by the University of Tennessee.
6. Consider developing a put and take or delayed harvest trout stocking program in the upper reach of the river (mile 16 and above).

Summary

We surveyed three rivers collecting nine fish samples and five benthic samples. Angler use of the two rivers (Nolichucky and Pigeon) was characterized during 2006 utilizing a roving creel survey. The Pigeon River was the only river where black bass CPUE data was collected during 2006. In the Pigeon River we observed a decrease in the mean catch of smallmouth bass and an overall decrease in the number of preferred (TL \geq 350mm) and memorable (TL \geq 430mm) size smallmouth bass when compared to the 2005 sample. We have observed a fairly drastic decline in the abundance of larger fish and a general decrease in the overall abundance of all size classes since 2004. At this point, it appears that the flood in 2004 is the reason for the observed declines. We feel that the timing of our samples was within the effective time frame for maximizing our catch of bass particularly larger fish.

Creel surveys for the Nolichucky and Pigeon rivers indicated most of the angling effort was focused on smallmouth bass although anglers fishing for any species contributed substantially to the angling pressure in both rivers. The majority of the expenditures incurred by anglers were directed at pursuing smallmouth bass. Overall, harvest was fairly low. In the Pigeon River, catfish and walleye were the most popular species harvested. Given the restrictive nature of the smallmouth bass regulation on the Pigeon, it was not surprising that the smallmouth bass harvest from the Pigeon was 0. In the Nolichucky River, smallmouth bass harvest was higher although most of the harvest was associated with the portion of river below Davy Crockett Dam. Most anglers fishing these rivers resided in Tennessee and lived within a 50 mile radius of the point of contact. The majority of anglers believed TWRA was doing a good job in managing warm water river fisheries in east Tennessee and most were satisfied with the regulations imposed on each respective river. Very few of the anglers interviewed belonged to an organized fishing group or club.

The IBI surveys for Little River and the Pigeon River remained relatively stable when compared to the previous year, although we did observe a substantial increase in the score at the Little River Townsend site (48 in 2005, 58 in 2006). Fish reintroductions continued on the Pigeon River with many of the introduced species collected in the 2006 IBI samples. The identification and evaluation of the fish kills above Tannery Island prompted more regulatory action for 2007 by TDEC and TWRA.

Over the past 13 years the stream survey unit has been conducting Index of Biotic Integrity surveys in various watersheds within the region. These have been done in response to requests made by TWRA personnel, cooperative effort requests, and general interest in determining the state of certain streams. Our compilation of these surveys has given us a reference database for many streams in the region that can be used for comparison purposes should we return for a routine survey or responding to a water quality issue. Table 18 lists our results for various streams surveyed during this time period.

Table 18. Index of Biotic Integrity and Benthic Biotic Index scores for samples conducted between 1994 and 2006.

Water	Watershed	Year Surveyed	County	IBI Score	Benthic BI Score
Capuchin Creek	Cumberland River	1994	Campbell	44 (Fair)	3 (Fair/Good)
Trammel Branch	Cumberland River	1994	Campbell	36 (Poor/Fair)	3 (Fair/Good)
Hatfield Creek	Cumberland River	1994	Campbell	42 (Fair)	3 (Fair/Good)
Baird Creek	Cumberland River	1994	Campbell	38 (Poor/Fair)	3 (Fair/Good)
Clear Fork (Site 1)	Cumberland River	1994	Campbell	52 (Good)	3 (Fair/Good)
Clear Fork (Site 2)	Cumberland River	1994	Claiborne	40 (Fair)	N/A
Clear Fork (Site 3)	Cumberland River	1994	Claiborne	24 (Very Poor/Poor)	1 (Poor)
Elk Fork Creek	Clear Fork	1994	Campbell	40 (Fair)	2 (Fair)
Fall Branch	Clear Fork	1994	Campbell	28 (Poor)	1 (Poor)
Crooked Creek	Clear Fork	1994	Campbell	38 (Poor/Fair)	2 (Fair)
Burnt Pone Creek	Clear Fork	1994	Campbell	38 (Poor/Fair)	2 (Fair)
Whistle Creek	Clear Fork	1994	Campbell	38 (Poor/Fair)	2 (Fair)
Little Elk Creek	Clear Fork	1994	Campbell	40 (Fair)	2 (Fair)
Lick Fork	Clear Fork	1994	Campbell	38 (Poor/Fair)	2 (Fair)
Terry Creek	Clear Fork	1994	Campbell	48 (Good)	2 (Fair)
Crouches Creek	Clear Fork	1994	Campbell	28 (Poor)	1 (Poor)
Hickory Creek (Site 1)	Clear Fork	1994	Campbell	46 (Fair/Good)	3 (Fair/Good)
Hickory Creek (Site 2)	Clear Fork	1994	Campbell	48 (Good)	2 (Fair)
White Oak Creek	Clear Fork	1994	Campbell	30 (Poor)	2 (Fair)
No Business Branch	Clear Fork	1994	Campbell	30 (Poor)	3 (Fair/Good)
Laurel Fork	Clear Fork	1994	Campbell	52 (Good)	3 (Fair/Good)
Lick Creek	Clear Fork	1994	Campbell	44 (Fair)	3 (Fair/Good)
Davis Creek	Clear Fork	1994	Campbell	38 (Poor/Fair)	2 (Fair)
Rock Creek	Clear Fork	1994	Campbell	54 (Good/Excellent)	3 (Fair/Good)
Little Tackett Creek	Clear Fork	1994	Claiborne	28 (Poor)	3 (Fair/Good)
Unnamed tributary to Little Tackett Creek	Clear Fork	1994	Claiborne	0 (No Fish)	3 (Fair/Good)
Rose Creek	Clear Fork	1994	Campbell	36 (Poor/Fair)	2 (Fair)
Rock Creek	Clear Fork	1994	Claiborne	28 (Poor)	2 (Fair)
Tracy Branch	Clear Fork	1994	Claiborne	34 (Poor)	2 (Fair)
Little Yellow Creek (Site 1)	Cumberland River	1994	Claiborne	38 (Poor/Fair)	N/A
Little Yellow Creek (Site 2)	Cumberland River	1994	Claiborne	38 (Poor/Fair)	N/A
Little Yellow Creek (Site 3)	Cumberland River	1994	Claiborne	36 (Poor/Fair)	N/A
Hickory Creek	Clinch River	1995	Knox	46 (Fair/Good)	3 (Fair/Good)
White Creek	Clinch River	1995	Union	34 (Poor) (SC)	4 (Good)
Little Sycamore Creek	Clinch River	1995	Claiborne	40 (Fair)	4.5 (Good/Excel).
Big War Creek	Clinch River	1995	Hancock	50 (Good)	4 (Good)
North Fork Clinch River	Clinch River	1995	Hancock	46 (Fair/Good)	4 (Good)
Old Town Creek (Site 1)	Powell River	1995	Claiborne	40 (Fair)	4 (Good)
Old Town Creek (Site 2)	Powell River	1995	Claiborne	42 (Fair)	4 (Good)
Indian Creek	Powell River	1995	Claiborne	N/A	4 (Good)
Sweetwater Creek	Tennessee River	1995	Loudon	30 (Poor)	3 (Fair/Good)
Burnett Creek	French Broad River	1995	Knox	46 (Fair/Good)	3 (Fair/Good)
Jockey Creek	Nolichucky River	1995	Greene	34 (Poor)	3 (Fair/Good)
South Indian Creek (Sandy Bottoms)	Nolichucky River	1995	Unicoi	38 (Poor/Fair)	4 (Good)
South Indian Creek (Ernestville)	Nolichucky River	1995	Unicoi	44 (Fair)	4 (Good)
Spivey Creek	Nolichucky River	1995	Unicoi	54 (Good/Excellent)	4 (Good)
Little Flat Creek	Holston River	1995	Knox	42 (Fair)	3 (Fair/Good)
Beech Creek	Holston River	1995	Hawkins	48 (Good)	4 (Good)
Big Creek	Holston River	1995	Hawkins	46 (Fair/Good)	4 (Good)
Alexander Creek	Holston River	1995	Hawkins	34 (Poor)	4 (Good)
Thomas Creek	South Fork Holston River	1995	Sullivan	54 (Good/Excellent)	4 (Good)
Hinds Creek	Clinch River	1996	Anderson	36 (Poor/Fair)	3 (Fair/Good)
Cove Creek	Clinch River	1996	Campbell	28 (Poor)	3 (Fair/Good)
Titus Creek	Clinch River	1996	Campbell	42 (Fair)	3 (Fair/Good)
Cloyd Creek	Tennessee River	1996	Loudon	36 (Poor/Fair)	4 (Good)
Sinking Creek	Little Tennessee River	1996	Loudon	34 (Poor)	4 (Good)
Baker Creek	Little Tennessee River	1996	Loudon	26 (Very Poor/Poor)	3 (Fair/Good)
Little Baker Creek	Little Tennessee River	1996	Blount	38 (Poor/Fair)	4 (Good)
Ninemile Creek	Little Tennessee River	1996	Blount	24 (Very Poor/Poor)	4 (Good)
East Fork Little Pigeon River	French Broad River	1996	Sevier	36 (Poor/Fair)	3 (Fair/Good)
Dunn Creek	French Broad River	1996	Sevier	32 (Poor)	4 (Good)
Wilhite Creek	French Broad River	1996	Sevier	44 (Fair)	4 (Good)
Watauga River (above Watauga Res.)	Holston River	1996	Johnson	42 (Fair)	4 (Good)
Stony Fork	Big South Fork	1996	Campbell	38 (Poor/Fair)	4 (Good)
Bullett Creek	Hiwassee River	1997	Monroe	50 (Good)	4.5 (Good/Excel.)
Canoe Branch	Powell River	1997	Claiborne	26 (V Poor/Poor) (SC)	4.7 (Excellent)
Town Creek	Tennessee River	1997	Loudon	34 (Poor)	2 (Fair)
Bat Creek	Little Tennessee River	1997	Monroe	30 (Poor)	1.5 (Poor/Fair)

Table 18. Continued.

Water	Watershed	Year Surveyed	County	IBI Score	Benthic BI Score
Island Creek	Little Tennessee River	1997	Monroe	40 (Fair)	4 (Good)
Little Pigeon River	French Broad River	1997	Sevier	40 (Fair)	2 (Fair)
West Prong Little Pigeon River	French Broad River	1997	Sevier	46 (Fair/Good)	2 (Fair)
Flat Creek	French Broad River	1997	Sevier	30 (Poor)	3.8 (Good)
Clear Creek	French Broad River	1997	Jefferson	34 (Poor)	2.2 (Fair)
Richland Creek	Nolichucky River	1997	Greene	30 (Poor)	2.3 (Fair)
Middle Creek	Nolichucky River	1997	Greene	34 (Poor)	4 (Good)
Sinking Creek	Pigeon River	1997	Cocke	30 (Poor)	3.8 (Good)
Chestuee Creek	Hiwassee River	1998	Monroe	28 (Poor)	2.5 (Fair/Fair -Good)
Fourmile Creek	Powell River	1998	Hancock	36 (Poor/Fair)	4.5 (Good/Excel.)
Martin Creek	Powell River	1998	Hancock	50 (Good)	4 (Good)
Big Creek	Tellico River	1998	Monroe	46 (Fair/Good)	4 (Good)
Oven Creek	Nolichucky River	1998	Cocke	40 (Fair)	2.9 (Fair/Good)
Cherokee Creek	Nolichucky River	1998	Washington	36 (Poor/Fair)	2.8 (Fair/Good)
Bennetts Fork	Cumberland River	2000	Claiborne	30 (Poor)	3.5 (Fair/Good)
Gulf Fork Big Creek	French Broad River	2001	Cocke	42 (Fair)	4.0 (Good)
Nolichucky River	French Broad River	2001	Unicoi	56 (Good/Excellent)	4.0 (Good)
North Fork Holston River	Holston River	2001	Hawkins	50 (Good)	4.5 (Good)
Stinking Creek	Cumberland River	2002	Campbell	42 (Fair)	4.5 (Good)
Straight Fork	Cumberland River	2002	Campbell	18 (Very Poor)	3.0 (Fair/Good)
Montgomery Fork	Cumberland River	2002	Campbell	48 (Good)	3.5 (Fair/Good)
Turkey Creek	Holston River	2003	Hamblen	34 (Poor)	1.5 (Poor)
Spring Creek	Holston River	2003	Hamblen	34 (Poor)	2.2 (Fair)
Cedar Creek	Holston River	2003	Hamblen	30 (Poor)	3.5 (Fair/Good)
Fall Creek	Holston River	2003	Hamblen	32 (Poor)	2.3 (Fair)
Holley Creek	Nolichucky River	2003	Greene	30 (Poor)	2.4 (Fair)
College Creek	Nolichucky River	2003	Greene	36 (Poor/Fair)	2.2 (Fair)
Kendrick Creek	South Fork Holston River	2004	Sullivan	34 (Poor)	3.8 (Fair/Good-Good)
Sinking Creek	South Fork Holston River	2004	Sullivan	32 (Poor)	3.8 (Fair/Good-Good)
Mud Creek	Nolichucky River	2004	Greene	46 (Fair/Good)	4.0 (Good)
New River (Site 1)	Big South Fork Cumberland River	2004	Anderson	30 (Poor)	4.2 (Good)
New River (Site 2)	Big South Fork Cumberland River	2004	Campbell	42 (Fair)	3.5 (Fair/Good)
Indian Fork	Big South Fork Cumberland River	2004	Anderson	41 (Fair)	3.8 (Fair/Good-Good)
Unnamed Tributary to Taylor Branch	Hiwassee River	2005	Bradley	48 (Good)	4.0 (Good)
Little River (Coulter's Bridge)	Tennessee River	2005	Blount	54 (Good/Excellent)	-
Little River (Townsend)	Tennessee River	2005	Blount	48 (Good)	-
Williams Creek	Clinch River	2005	Grainger	42 (Fair)	4.3 (Good)
Beaver Creek (Site 1)	Holston River	2005	Jefferson	38 (Poor/Fair)	2.8 (Fair/Fair-Good)
Beaver Creek (Site 2)	Holston River	2005	Jefferson	30 (Poor)	3.2 (Fair/Good)
Doe Creek	Holston River	2005	Johnson	46 (Fair/Good)	4.0 (Good)
Gap Creek	Nolichucky River	2005	Greene	36 (Poor/Fair)	3.5 (Fair/Good)
Pigeon River (Tannery Island)	French Broad River	2005	Cocke	52 (Good)	2.8 (Fair/Fair-Good)
Pigeon River (Denton)	French Broad River	2005	Cocke	48 (Good)	3.8 (Fair-Good/Good)
Little River (Coulter's Bridge)	Tennessee River	2006	Blount	58 (Excellent)	4.2 (Good)
Little River (Townsend)	Tennessee River	2006	Blount	58 (Excellent)	4.7 (Good-Excellent)
Pigeon River (Tannery Island)	French Broad River	2006	Cocke	48 (Good)	3.5 (Fair-Good)
Pigeon River (Denton)	French Broad River	2006	Cocke	50 (Good)	3.8 (Fair-Good/Good)
Pigeon River (Hwy. 73 Bridge)	French Broad River	2006	Cocke	-	3.8 (Fair-Good/Good)

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APPENDIX A

Common and scientific names of fishes used in this report (Nelson et al. 2004)

Family	Common Name	Scientific Name
Catostomidae	Black buffalo	<i>Ictiobus niger</i>
	Black redhorse	<i>Moxostoma duquesnei</i>
	Golden redhorse	<i>Moxostoma erythrurum</i>
	Northern hog sucker	<i>Hypentelium nigricans</i>
	Quillback	<i>Carpionodes cyprinus</i>
	River redhorse	<i>Moxostoma carinatum</i>
	Silver redhorse	<i>Moxostoma anisurum</i>
	Smallmouth buffalo	<i>Ictiobus bubalus</i>
	Smallmouth redhorse	<i>Moxostoma breviceps</i>
	Spotted sucker	<i>Minytreram melanops</i>
Centrarchidae	Black crappie	<i>Pomoxis nigromaculatis</i>
	Bluegill	<i>Lepomis macrochirus</i>
	Green sunfish	<i>Lepomis cyanellus</i>
	Largemouth bass	<i>Micropterus salmoides</i>
	Redbreast sunfish	<i>Lepomis auritus</i>
	Redear sunfish	<i>Lepomis microlophus</i>
	Rock bass	<i>Ambloplites rupestris</i>
	Smallmouth bass	<i>Micropterus dolomieu</i>
	Spotted bass	<i>Micropterus punctulatus</i>
	White crappie	<i>Pomoxis annualris</i>
Clupeidae	Gizzard shad	<i>Dorosoma cepedianum</i>
Cottidae	Banded sculpin	<i>Cottus carolinae</i>
Cyprinidae	Bigeye chub	<i>Hybopsis amblops</i>
	Blotched chub	<i>Erimystax insignis</i>
	Carp	<i>Cyprinus carpio</i>
	Creek chub	<i>Semotilus atromaculatus</i>
	Largescale stoneroller	<i>Campostoma oligolepis</i>
	Mimic shiner	<i>Notropis vollucelus</i>
	Mountain shiner	<i>Lythrurus lirus</i>
	River chub	<i>Nocomis micropogon</i>
	Highland shiner	<i>Notropis micropteryx</i>
	Silver shiner	<i>Notropis photogenis</i>
	Spotfin shiner	<i>Cyprinella spiloptera</i>
	Stargazing minnow	<i>Phenocobius uranops</i>
	Striped shiner	<i>Luxilus chrysocephalus</i>
	Telescope shiner	<i>Notropis telescopus</i>
	Tennessee shiner	<i>Notropis leuciodus</i>
	Warpaint shiner	<i>Luxilus coccogenis</i>
	Whitetail shiner	<i>Cyprinella galactura</i>
Fundulidae	Northern studfish	<i>Fundulus catenatus</i>
Ictaluridae	Black bullhead	<i>Ameiurus melas</i>
	Brown bullhead	<i>Ameiurus nebulosus</i>
	Channel catfish	<i>Ictalurus punctatus</i>

Ictaluridae	Mountain madtom Yellow bullhead	<i>Noturus eleutherus</i> <i>Ameiurus natalis</i>
Lepisosteidae	Longnose gar	<i>Lepisosteus osseus</i>
Moronidae	White Bass	<i>Morone chrysops</i>
Percidae	Banded darter Blotchside logperch Bluebreast darter Blueside darter Fantail darter Gilt darter Greenside darter Logperch Longhead darter Rainbow darter Redline darter Sauger Snubnose darter Stripetail darter Stripetail darter Tangerine darter Walleye Wounded darter	<i>Etheostoma tennesseense</i> <i>Etheostoma zonale</i> <i>Percina burtoni</i> <i>Etheostoma camurum</i> <i>Etheostoma jessiae</i> <i>Etheostoma flabellare</i> <i>Percina evides</i> <i>Etheostoma blenniodes</i> <i>Percina caprodes</i> <i>Percina macrocephala</i> <i>Etheostoma caeruleum</i> <i>Etheostoma rufilineatum</i> <i>Sander canadense</i> <i>Etheostoma simoterum</i> <i>Etheostoma kennicotti</i> <i>Etheostoma kennocotti</i> <i>Percina aurantiaca</i> <i>Sander vitreum</i> <i>Etheostoma vulneratum</i>
Petromyzontidae	American brook lamprey Mountain brook lamprey Ohio lamprey	<i>Lampetra appendix</i> <i>Ichthyomyzon greeleyi</i> <i>Ichthyomyzon bdellium</i>
Poeciliidae	Western mosquitofish	<i>Gambusia affinis</i>
Salmonidae	Rainbow trout	<i>Oncorhynchus mykiss</i>
Sciaenidae	Drum	<i>Aplodinotus grunniens</i>

APPENDIX B

Analysis tables for angler data collected from the Nolichucky and Pigeon rivers during 2006.

EXPANDED EFFORT AND TRIP ESTIMATES BY MONTHLY TIME BLOCKS
 RELATIVE STANDARD ERRORS FOR EFFORT CALCULATIONS ARE INCLUDED
 NOTE - Since no completed trips were recorded for Pigeon River
 in April, an average trip length of 2.62 hours was used by
 taking the April mean trip length from the other two Rivers

----- RIVER=Pigeon River -----

MONTH	ANGLER HOURS	RSE ANGLER HOURS	TRIPS	MEAN TRIP LENGTH
APRIL	1675.48	32.2212	639.49	2.62000
MAY	5277.36	9.0970	1161.19	4.54478
JUNE	3402.44	14.3052	1837.27	1.85190
JULY	7632.38	21.2115	2079.32	3.67061
AUGUST	2466.11	19.4376	568.10	4.34097
SEPTEMBER	2939.75	41.9497	6532.78	0.45000

----- RIVER=Nolichucky River Upper -----

MONTH	ANGLER HOURS	RSE ANGLER HOURS	TRIPS	MEAN TRIP LENGTH
APRIL	2663.93	32.0569	834.22	3.19333
MAY	7513.89	18.3858	1675.76	4.48387
JUNE	6530.59	30.3169	2909.27	2.24475
JULY	6550.40	22.6954	767.51	8.53458
AUGUST	2616.33	21.0358	993.95	2.63226
SEPTEMBER	1311.92	52.4471	535.48	2.45000

----- RIVER=Nolichucky River Lower -----

MONTH	ANGLER HOURS	RSE ANGLER HOURS	TRIPS	MEAN TRIP LENGTH
APRIL	1180.63	43.5115	574.05	2.05667
MAY	1505.93	44.6006	487.14	3.09140
JUNE	5030.77	3.4314	1002.07	5.02037
JULY	2425.05	24.6021	354.79	6.83513
AUGUST	1533.60	24.2500	186.98	8.20194
SEPTEMBER	1294.75	39.1807	194.70	6.65000

ANNUAL TOTAL ANGLER EFFORT CALCULATIONS
 FOR REGION 4 RIVERS 2006
 RELATIVE STANDARD EFFORS FOR EFFORT CALCULATONS ARE INCLUDED

----- RIVER=Pigeon River -----

TOTAL ANGLER HOURS	RSE ANGLER HOURS	TOTAL NUMBER OF TRIPS	MEAN TRIP LENGTH
23393.51	9.68235	12818.15	1.82503

----- RIVER=Nolichucky River Upper -----

TOTAL ANGLER HOURS	RSE ANGLER HOURS	TOTAL NUMBER OF TRIPS	MEAN TRIP LENGTH
27187.04	11.3633	7716.18	3.52338

----- RIVER=Nolichucky River Lower -----

TOTAL ANGLER HOURS	RSE ANGLER HOURS	TOTAL NUMBER OF TRIPS	MEAN TRIP LENGTH
12970.72	9.43108	2799.73	4.63285

ANGLER EFFORT (HOURS) DIRECTED AT A PARTICULAR SPECIES
FOR PIGEON RIVER 2006
WITHIN MONTHLY TIME BLOCKS

----- RIVER=Pigeon River MONTH=APRIL -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	0.8813	14.77
Smallmouth Bass	82.8203	1387.63
Any Species	16.2983	273.07

----- RIVER=Pigeon River MONTH=MAY -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	1.0815	57.08
Smallmouth Bass	78.7413	4155.46
Any Species	19.8638	1048.28
SMB and Catfish	0.3134	16.54

----- RIVER=Pigeon River MONTH=JUNE -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	6.7656	230.19
Rainbow Trout	1.2312	41.89
Rock Bass	8.7725	298.48
Smallmouth Bass	35.2130	1198.10
Walleye	7.1288	242.55
Any Species	40.8889	1391.22

----- RIVER=Pigeon River MONTH=JULY -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Carp	0.5750	43.88
Any Catfish	0.2587	19.75
Rainbow Trout	0.2300	17.55
Smallmouth Bass	82.1640	6271.07
Any Species	16.7332	1277.14
SMB and Rainbow Trt	0.0391	2.98

ANGLER EFFORT (HOURS) DIRECTED AT A PARTICULAR SPECIES
 FOR PIDGEON RIVER 2006
 WITHIN MONTHLY TIME BLOCKS (cont.)

----- RIVER=Pigeon River MONTH=AUGUST -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	1.0903	26.89
Rainbow Trout	5.5573	137.05
Smallmouth Bass	47.8618	1180.32
Any Species	37.5516	926.06
SMB and Catfish	7.9390	195.78

----- RIVER=Pigeon River MONTH=SEPTEMBER -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	2.2450	66.00
Smallmouth Bass	77.3707	2274.50
Any Species	20.3843	599.25

ANGLER EFFORT (HOURS) DIRECTED AT A PARTICULAR SPECIES
FOR UPPER NOLICHUCKY RIVER 2006
WITHIN MONTHLY TIME BLOCKS

----- RIVER=Nolichucky River Upper MONTH=APRIL -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	8.6661	230.86
Rainbow Trout	11.9168	317.45
Smallmouth Bass	9.5610	254.70
Any Species	69.8562	1860.92

----- RIVER=Nolichucky River Upper MONTH=MAY -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	2.6821	201.53
Rainbow Trout	2.2948	172.43
Any Black Bass	2.4853	186.75
Smallmouth Bass	42.9758	3229.15
Any Species	46.1964	3471.14
SMB and Rainbow Trt	3.3656	252.89

----- RIVER=Nolichucky River Upper MONTH=JUNE -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	11.5316	753.08
Rainbow Trout	1.8612	121.55
Smallmouth Bass	63.6095	4154.07
Any Species	22.5811	1474.68
SMB and Rainbow Trt	0.4166	27.21

----- RIVER=Nolichucky River Upper MONTH=JULY -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	6.9376	454.44
Any Sunfish	0.1794	11.75
Smallmouth Bass	72.2121	4730.18
Any Species	20.2225	1324.65
SMB and Catfish	0.1794	11.75
SMB and Rainbow Trt	0.2691	17.63

ANGLER EFFORT (HOURS) DIRECTED AT A PARTICULAR SPECIES
 FOR UPPER NOLICHUCKY RIVER 2006
 WITHIN MONTHLY TIME BLOCKS (cont.)

----- RIVER=Nolichucky River Upper MONTH=AUGUST -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	6.0683	158.77
Rainbow Trout	1.5171	39.69
Any Black Bass	23.6665	619.19
Smallmouth Bass	46.3256	1212.03
Any Species	22.4225	586.65

----- RIVER=Nolichucky River Upper MONTH=SEPTEMBER -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	24.8504	326.017
Smallmouth Bass	53.9807	708.181
Any Species	21.1689	277.718

ANGLER EFFORT (HOURS) DIRECTED AT A PARTICULAR SPECIES
FOR LOWER NOLICHUCKY RIVER 2006
WITHIN MONTHLY TIME BLOCKS

----- RIVER=Nolichucky River Lower MONTH=APRIL -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	0.6868	8.109
Smallmouth Bass	49.8236	588.230
White Crappie	16.0108	189.027
Any Species	6.5807	77.693
SMB and Catfish	26.8981	317.566

----- RIVER=Nolichucky River Lower MONTH=MAY -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	9.5231	143.411
Smallmouth Bass	61.9846	933.444
SMB and Catfish	0.8000	12.047
SMB and Rainbow Trt	27.6923	417.026

----- RIVER=Nolichucky River Lower MONTH=JUNE -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	21.4617	1079.69
Smallmouth Bass	53.9601	2714.61
Any Species	24.2563	1220.28
SMB and Catfish	0.3220	16.20

----- RIVER=Nolichucky River Lower MONTH=JULY -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Black Bass	37.8349	917.51
Smallmouth Bass	61.8243	1499.27
Any Species	0.3409	8.27

ANGLER EFFORT (HOURS) DIRECTED AT A PARTICULAR SPECIES
 FOR LOWER NOLICHUCKY RIVER 2006
 WITHIN MONTHLY TIME BLOCKS (cont.)

----- RIVER=Nolichucky River Lower MONTH=AUGUST -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	15.8471	243.031
Any Black Bass	61.4675	942.664
Smallmouth Bass	10.1921	156.306
Any Species	12.4933	191.597

----- RIVER=Nolichucky River Lower MONTH=SEPTEMBER -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	2.9812	38.600
Any Black Bass	26.4653	342.660
Smallmouth Bass	33.3930	432.356
Any Species	37.1604	481.135

ANGLER EFFORT (HOURS) DIRECTED AT A PARTICULAR SPECIES
FOR THE PIDGEON RIVER 2006
CALCULATED FOR THE ENTIRE SAMPLING SEASON

----- RIVER=Pigeon River -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Carp	0.2759	64.54
Any Catfish	1.2245	286.45
Rainbow Trout	0.8001	187.18
Rock Bass	0.7863	183.95
Smallmouth Bass	73.3915	17168.84
Walleye	0.6390	149.49
Any Species	21.9567	5136.45
SMB and Catfish	0.9072	212.22
SMB and Rainbow Trt	0.0188	4.39

ANGLER EFFORT (HOURS) DIRECTED AT A PARTICULAR SPECIES
FOR THE UPPER NOLICHUCKY RIVER 2006
CALCULATED FOR THE ENTIRE SAMPLING SEASON

----- RIVER=Nolichucky River Upper -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	8.2658	2247.23
Rainbow Trout	1.9728	536.35
Any Sunfish	0.0490	13.33
Any Black Bass	2.5003	679.77
Smallmouth Bass	55.7025	15143.85
Any Species	30.4687	8283.55
SMB and Catfish	0.0490	13.33
SMB and Rainbow Trt	0.9918	269.64

ANGLER EFFORT (HOURS) DIRECTED AT A PARTICULAR SPECIES
FOR THE LOWER NOLICHUCKY RIVER 2006
CALCULATED FOR THE ENTIRE SAMPLING SEASON

----- RIVER=Nolichucky River Lower -----

TARGET	Percent of Total Frequency	HOURS SPENT TARGETTING
Any Catfish	8.4479	1095.76
Any Black Bass	30.1923	3916.16
Smallmouth Bass	42.4257	5502.92
White Crappie	1.7076	221.49
Any Species	12.4749	1618.08
SMB and Catfish	2.9697	385.20
SMB and Rainbow Trt	1.7818	231.12

MEAN DAILY CATCH PER UNIT EFFORT ESTIMATES (FISH-PER-HOUR)
 FOR ALL COMBINED SPECIES CAUGHT FROM REGION 4 STREAMS
 SAMPLED IN THE 2006 CREEEL SURVEY
 INCLUDED ARE RELATIVE STANDARD ERRORS FOR THE ESTIMATES

----- RIVER=Pigeon River -----

MONTH	MEAN CATCH PER UNIT EFFORT	RSE CPUE	MEAN HARVEST PER UNIT EFFORT	RSE HPUE	MEAN RELEASE PER UNIT EFFORT	RSE RPUE
APRIL	0.85173	74.1029	0.12484	100.000	0.72689	88.9202
MAY	0.77458	28.4404	0.07283	76.993	0.70175	33.5800
JUNE	1.68044	44.9037	0.90340	89.454	0.77703	38.6752
JULY	1.07964	26.8156	0.01535	61.204	1.06430	27.0854
AUGUST	0.87674	39.8202	0.06062	93.488	0.81612	43.8588
SEPTEMBER	0.51049	27.4118	0.00000	.	0.51049	27.4118

----- RIVER=Nolichucky River Upper -----

MONTH	MEAN CATCH PER UNIT EFFORT	RSE CPUE	MEAN HARVEST PER UNIT EFFORT	RSE HPUE	MEAN RELEASE PER UNIT EFFORT	RSE RPUE
APRIL	0.27922	50.6197	0.08447	86.8350	0.19475	62.4469
MAY	0.50085	23.0800	0.13767	66.9611	0.36317	31.3590
JUNE	0.39659	20.7396	0.06220	52.8746	0.33439	27.1390
JULY	0.85046	25.4161	0.10247	32.1453	0.74799	30.8254
AUGUST	0.37945	49.9562	0.02606	51.6199	0.35339	55.0721
SEPTEMBER	0.37083	31.0415	0.09009	36.6041	0.28074	39.5325

----- RIVER=Nolichucky River Lower -----

MONTH	MEAN CATCH PER UNIT EFFORT	RSE CPUE	MEAN HARVEST PER UNIT EFFORT	RSE HPUE	MEAN RELEASE PER UNIT EFFORT	RSE RPUE
APRIL	0.42810	15.4702	0.34583	36.4805	0.08227	100.000
MAY	0.49063	31.8098	0.02600	50.0679	0.46463	31.027
JUNE	0.67189	21.5777	0.29316	52.9211	0.37873	35.393
JULY	0.89071	18.7520	0.17585	87.6819	0.71486	20.120
AUGUST	1.70001	21.9016	0.02091	79.5205	1.67910	21.972
SEPTEMBER	1.16225	59.3869	0.24474	55.7058	0.91751	74.720

CATCH-PER-UNIT-EFFORT ESTIMATES (ANGLER_HOURS)
 FOR ALL SPECIES ENCOUNTERED BY ANGLERS IN REGION4 RIVERS
 ESTIMATE WERE CALCULATED FOR THE ENTIRE SAMPLE SEASON
 FROM THE 2006 CREEL SURVEY
 RELATIVE STANDARD ERRORS (RSE) ARE INCLUDED

----- RIVER=Pigeon River -----

CATCH PER HOUR	RSE CATCH PER HOUR	HARVEST PER HOUR	RSE HARVEST PER HOUR	RELEASE PER HOUR	RSE RELEASE PER HOUR
0.98897	60.2559	0.16816	124.055	0.82081	59.2314

----- RIVER=Nolichucky River Upper -----

CATCH PER HOUR	RSE CATCH PER HOUR	HARVEST PER HOUR	RSE HARVEST PER HOUR	RELEASE PER HOUR	RSE RELEASE PER HOUR
0.52036	53.3478	0.092811	81.9901	0.42755	60.0581

----- RIVER=Nolichucky River Lower -----

CATCH PER HOUR	RSE CATCH PER HOUR	HARVEST PER HOUR	RSE HARVEST PER HOUR	RELEASE PER HOUR	RSE RELEASE PER HOUR
0.84007	51.1763	0.20798	83.1352	0.63209	57.8596

CPE ESTIMATES BASED ON CATCH OF INTENDED SPECIES
FOR REGION 4 RIVERS
SAMPLED FROM APRIL THROUGH SEPTEMBER 2006

----- RIVER=Pigeon River -----

INTEND	INTENDED CATCH PER HOUR	RSE CATCH	INTENDED HARVEST PER HOUR	RSE HARVEST	INTENDED RELEASE PER HOUR	RSE RELEASE
Carp	0.00000	.	0.00000	.	0.00000	.
Any Catfish	0.09013	76.5252	0.00000	.	0.09013	76.5252
Rainbow Trout	0.00000	.	0.00000	.	0.00000	.
Rock Bass	2.09524	28.5714	2.09524	28.5714	0.00000	.
Smallmouth Bass	0.97829	14.0142	0.00000	.	0.97829	14.0142
Walleye	0.65502	47.1616	0.65502	47.1616	0.00000	.
Any Species	0.48391	14.6116	0.09275	37.0467	0.39116	17.7140
SMB and Catfish	0.62112	44.7205	0.00000	.	0.62112	44.7205
SMB and Rainbow Trt	0.00000	.	0.00000	.	0.00000	.

----- RIVER=Nolichucky River Upper -----

INTEND	INTENDED CATCH PER HOUR	RSE CATCH	INTENDED HARVEST PER HOUR	RSE HARVEST	INTENDED RELEASE PER HOUR	RSE RELEASE
Any Catfish	0.14919	27.4572	0.07898	39.196	0.07021	41.6718
Rainbow Trout	0.07455	75.1317	0.04970	104.534	0.02485	98.7238
Any Sunfish	0.00000	.	0.00000	.	0.00000	.
Any Black Bass	0.40000	96.0000	0.00000	.	0.40000	96.0000
Smallmouth Bass	0.63636	15.3959	0.03156	43.536	0.60481	16.1406
Any Species	0.31294	15.3091	0.06174	43.601	0.25120	14.8815
SMB and Catfish	0.00000	.	0.00000	.	0.00000	.
SMB and Rainbow Trt	0.45317	45.5417	0.45317	45.542	0.00000	.

----- RIVER=Nolichucky River Lower -----

INTEND	INTENDED CATCH PER HOUR	RSE CATCH	INTENDED HARVEST PER HOUR	RSE HARVEST	INTENDED RELEASE PER HOUR	RSE RELEASE
Any Catfish	0.17908	52.8019	0.16117	63.2497	0.01791	62.5889
Any Black Bass	1.09574	39.1690	0.00000	.	1.09574	39.1690
Smallmouth Bass	0.91294	21.6608	0.07057	45.2766	0.84237	23.6718
White Crappie	0.00000	.	0.00000	.	0.00000	.
Any Species	0.70969	26.0645	0.24757	56.3003	0.46212	33.8968
SMB and Catfish	0.19342	8.9478	0.19342	8.9478	0.00000	.
SMB and Rainbow Trt	0.16667	.	0.00000	.	0.16667	.

ESTIMATED TOTAL NUMBER OF FISH CAUGHT, HARVESTED, AND RELEASED
BY MONTHS
FROM REGION 4 RIVERS 2006
ALL SPECIES COMBINED
INCLUDED ARE RELATIVE STANDARD ERRORS

----- RIVER=Pigeon River -----

MONTH	TOTAL NUMBER CAUGHT	RSE RELEASE	TOTAL NUMBER HARVESTED	RSE HARVEST	TOTAL NUMBER RELEASED	RSE_REL
APRIL	1427.05	84.2588	209.17	109.893	1217.88	98.8225
MAY	4087.73	29.9717	384.35	77.844	3703.38	34.9242
JUNE	5717.59	47.5630	3073.78	91.490	2643.81	41.6055
JULY	8240.23	34.6606	117.12	66.063	8123.11	34.8791
AUGUST	2162.14	44.9819	149.51	97.201	2012.63	48.7246
SEPTEMBER	1500.72	51.4142	0.00	.	1500.72	51.4142

----- RIVER=Nolichucky River Upper -----

MONTH	TOTAL NUMBER CAUGHT	RSE RELEASE	TOTAL NUMBER HARVESTED	RSE HARVEST	TOTAL NUMBER RELEASED	RSE_REL
APRIL	743.81	62.0751	225.02	96.6583	518.80	72.9932
MAY	3763.29	29.8116	1034.46	70.5224	2728.84	36.8058
JUNE	2589.95	37.2663	406.19	63.0222	2183.76	41.5130
JULY	5570.82	34.5591	671.22	40.0203	4899.60	38.9132
AUGUST	992.75	55.2138	68.18	56.7893	924.57	60.0803
SEPTEMBER	486.50	63.0819	118.19	66.7766	368.31	68.8724

----- RIVER=Nolichucky River Lower -----

MONTH	TOTAL NUMBER CAUGHT	RSE RELEASE	TOTAL NUMBER HARVESTED	RSE HARVEST	TOTAL NUMBER RELEASED	RSE_REL
APRIL	505.43	46.6678	408.30	58.9579	97.13	117.416
MAY	738.85	56.5894	39.15	70.6729	699.70	56.066
JUNE	3380.11	21.8613	1474.81	53.0633	1905.30	35.580
JULY	2160.02	31.2759	426.44	93.5880	1733.58	32.165
AUGUST	2607.14	33.1052	32.07	85.3430	2575.06	33.154
SEPTEMBER	1504.82	74.8555	316.88	71.5167	1187.94	89.304

ESTIMATED TOTAL ANNUAL CATCH, HARVEST AND RELEASE
FROM REGION 4 STREAMS 2006
ALL SPECIES ARE COMBINED
INCLUDED ARE RELATIVE STANDARD ERRORS FOR THE ESTIMATES

----- RIVER=Pigeon River -----

TOTAL NUMBER CAUGHT	RSE CATCH	TOTAL NUMBER HARVESTED	RSE HARVEST	TOTAL NUMBER RELEASED	RSE RELEASE
23135.45	19.3500	3933.93	72.2478	19201.53	19.4275

----- RIVER=Nolichucky River Upper -----

TOTAL NUMBER CAUGHT	RSE CATCH	TOTAL NUMBER HARVESTED	RSE HARVEST	TOTAL NUMBER RELEASED	RSE RELEASE
14147.13	18.0277	2523.25	33.7432	11623.88	21.0412

----- RIVER=Nolichucky River Lower -----

TOTAL NUMBER CAUGHT	RSE CATCH	TOTAL NUMBER HARVESTED	RSE HARVEST	TOTAL NUMBER RELEASED	RSE RELEASE
10896.37	16.5363	2697.65	34.8241	8198.72	20.3793

EXPANDED SPECIES COMPOSITION ESTIMATES FOR THE NUMBER OF
FISH HARVESTED, THE NUMBER OF FISH RELEASED, AND THE TOTAL CATCH
DATA ARE GIVEN BY MONTH
INCLUDED ARE PERCENT OF THE RESPECTIVE COMPOSITIONS

----- RIVER=Pigeon River MONTH=APRIL -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Sauger	0.00	0	1217.88	100	1217.88	85.34
Freshwater Drum	209.17	100	0.00	0	209.17	14.66

----- RIVER=Pigeon River MONTH=MAY -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Carp	0.00	0	194.91	5.26	194.91	4.77
Smallmouth Buffalo	96.09	25	0.00	0.00	96.09	2.35
Any Catfish	0.00	0	389.83	10.53	389.83	9.54
Rainbow Trout	0.00	0	2144.06	57.89	2144.06	52.45
White Bass	0.00	0	194.91	5.26	194.91	4.77
Any Sunfish	0.00	0	194.91	5.26	194.91	4.77
Redear Sunfish	96.09	25	0.00	0.00	96.09	2.35
Black Crappie	96.09	25	0.00	0.00	96.09	2.35
Walleye	96.09	25	584.74	15.79	680.83	16.66

----- RIVER=Pigeon River MONTH=JUNE -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Channel Catfish	768.44	25	0.00	0.00	768.44	13.44
Rainbow Trout	0.00	0	587.51	22.22	587.51	10.28
White Bass	0.00	0	587.51	22.22	587.51	10.28
Any Sunfish	0.00	0	1175.03	44.44	1175.03	20.55
Walleye	2305.33	75	146.88	5.56	2452.21	42.89
Freshwater Drum	0.00	0	146.88	5.56	146.88	2.57

----- RIVER=Pigeon River MONTH=JULY -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Carp	0.00	0.00	26.99	0.33	26.99	0.33
Any Catfish	0.00	0.00	80.96	1.00	80.96	0.98
Channel Catfish	16.73	14.29	107.95	1.33	124.68	1.51
Rainbow Trout	0.00	0.00	431.79	5.32	431.79	5.24
White Bass	16.73	14.29	215.90	2.66	232.63	2.82
Rock Bass	16.73	14.29	971.53	11.96	988.27	11.99

EXPANDED SPECIES COMPOSITION ESTIMATES FOR THE NUMBER OF
FISH HARVESTED, THE NUMBER OF FISH RELEASED, AND THE TOTAL CATCH
DATA ARE GIVEN BY MONTH
INCLUDED ARE PERCENT OF THE RESPECTIVE COMPOSITIONS

----- RIVER=Pigeon River MONTH=JULY -----
(continued)

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
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Any Sunfish	0.00	0.00	53.97	0.66	53.97	0.66
Redbreast Sunfish	0.00	0.00	26.99	0.33	26.99	0.33
Green Sunfish	0.00	0.00	107.95	1.33	107.95	1.31
Bluegill	0.00	0.00	323.84	3.99	323.84	3.93
Smallmouth Bass	0.00	0.00	4884.66	60.13	4884.66	59.28
Largemouth Bass	0.00	0.00	458.78	5.65	458.78	5.57
White Crappie	0.00	0.00	26.99	0.33	26.99	0.33
Logperch	0.00	0.00	26.99	0.33	26.99	0.33
Sauger	0.00	0.00	26.99	0.33	26.99	0.33
Walleye	16.73	14.29	161.92	1.99	178.65	2.17
Freshwater Drum	50.19	42.86	188.91	2.33	239.10	2.90

----- RIVER=Pigeon River MONTH=AUGUST -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Moxostoma spp.	0.00	0	20.13	1	20.13	0.93
Channel Catfish	0.00	0	80.51	4	80.51	3.72
Rock Bass	149.51	100	885.56	44	1035.07	47.87
Redbreast Sunfish	0.00	0	221.39	11	221.39	10.24
Bluegill	0.00	0	40.25	2	40.25	1.86
Smallmouth Bass	0.00	0	664.17	33	664.17	30.72
Largemouth Bass	0.00	0	100.63	5	100.63	4.65

----- RIVER=Pigeon River MONTH=SEPTEMBER -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Channel Catfish	0	91.67	13.83	0.92	13.83	0.92
Rock Bass	0	0.00	134.86	8.99	134.86	8.99
Bluegill	0	8.33	51.87	3.46	51.87	3.46
Smallmouth Bass	0	0.00	1262.12	84.10	1262.12	84.10
Spotted Bass	0	0.00	6.92	0.46	6.92	0.46
Largemouth Bass	0	0.00	31.12	2.07	31.12	2.07

EXPANDED SPECIES COMPOSITION ESTIMATES FOR THE NUMBER OF
FISH HARVESTED, THE NUMBER OF FISH RELEASED, AND THE TOTAL CATCH
DATA ARE GIVEN BY MONTH
INCLUDED ARE PERCENT OF THE RESPECTIVE COMPOSITIONS

----- RIVER=Nolichucky River Upper MONTH=APRIL -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Moxostoma spp.	0.00	0	518.8	100	518.80	69.75
Channel Catfish	225.02	100	0.0	0	225.02	30.25

----- RIVER=Nolichucky River Upper MONTH=MAY -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Stoneroller	0.00	0.00	272.88	10.00	272.88	7.25
Carp	0.00	0.00	90.96	3.33	90.96	2.42
Channel Catfish	0.00	0.00	181.92	6.67	181.92	4.83
Rainbow Trout	689.64	66.67	90.96	3.33	780.60	20.74
Rock Bass	0.00	0.00	181.92	6.67	181.92	4.83
Any Sunfish	344.82	33.33	1091.53	40.00	1436.35	38.17
Redbreast Sunfish	0.00	0.00	90.96	3.33	90.96	2.42
Bluegill	0.00	0.00	181.92	6.67	181.92	4.83
Spotted Bass	0.00	0.00	363.84	13.33	363.84	9.67
Largemouth Bass	0.00	0.00	181.92	6.67	181.92	4.83

----- RIVER=Nolichucky River Upper MONTH=JUNE -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Stoneroller	0.00	0.00	181.98	8.33	181.98	7.03
Carp	0.00	0.00	121.32	5.56	121.32	4.68
River Chub	0.00	0.00	181.98	8.33	181.98	7.03
Notropis spp.	0.00	0.00	60.66	2.78	60.66	2.34
Moxostoma spp.	0.00	0.00	121.32	5.56	121.32	4.68
Golden Redhorse	19.34	4.76	0.00	0.00	19.34	0.75
Channel Catfish	19.34	4.76	0.00	0.00	19.34	0.75
Flathead Catfish	38.68	9.52	60.66	2.78	99.34	3.84
Rainbow Trout	135.40	33.33	121.32	5.56	256.72	9.91
Rock Bass	58.03	14.29	60.66	2.78	118.69	4.58
Any Sunfish	0.00	0.00	121.32	5.56	121.32	4.68
Redbreast Sunfish	58.03	14.29	60.66	2.78	118.69	4.58
Smallmouth Bass	77.37	19.05	1091.88	50.00	1169.25	45.15

EXPANDED SPECIES COMPOSITION ESTIMATES FOR THE NUMBER OF
FISH HARVESTED, THE NUMBER OF FISH RELEASED, AND THE TOTAL CATCH
DATA ARE GIVEN BY MONTH
INCLUDED ARE PERCENT OF THE RESPECTIVE COMPOSITIONS

----- RIVER=Nolichucky River Upper MONTH=JULY -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Carp	0.00	0.00	19.60	0.4	19.60	0.35
Moxostoma spp.	0.00	0.00	78.39	1.6	78.39	1.41
Flathead Catfish	129.91	19.35	58.80	1.2	188.71	3.39
Rainbow Trout	129.91	19.35	58.80	1.2	188.71	3.39
Rock Bass	151.57	22.58	1097.51	22.4	1249.08	22.42
Any Sunfish	0.00	0.00	58.80	1.2	58.80	1.06
Bluegill	151.57	22.58	568.35	11.6	719.92	12.92
Smallmouth Bass	108.26	16.13	2861.37	58.4	2969.63	53.31
Spotted Bass	0.00	0.00	97.99	2.0	97.99	1.76

----- RIVER=Nolichucky River Upper MONTH=AUGUST -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Carp	34.09	50	66.04	7.14	100.13	10.09
Rock Bass	0.00	0	330.20	35.71	330.20	33.26
Bluegill	34.09	50	44.03	4.76	78.12	7.87
Smallmouth Bass	0.00	0	440.27	47.62	440.27	44.35
Spotted Bass	0.00	0	44.03	4.76	44.03	4.43

----- RIVER=Nolichucky River Upper MONTH=SEPTEMBER -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Carp	0.00	0.00	4.53	1.23	4.53	0.93
Channel Catfish	8.15	6.90	4.53	1.23	12.68	2.61
Flathead Catfish	4.08	3.45	1.51	0.41	5.58	1.15
Rock Bass	12.23	10.34	4.53	1.23	16.75	3.44
Bluegill	0.00	0.00	51.32	13.93	51.32	10.55
Smallmouth Bass	93.74	79.31	300.38	81.56	394.12	81.01
Largemouth Bass	0.00	0.00	1.51	0.41	1.51	0.31

EXPANDED SPECIES COMPOSITION ESTIMATES FOR THE NUMBER OF
FISH HARVESTED, THE NUMBER OF FISH RELEASED, AND THE TOTAL CATCH
DATA ARE GIVEN BY MONTH
INCLUDED ARE PERCENT OF THE RESPECTIVE COMPOSITIONS

----- RIVER=Nolichucky River Lower MONTH=APRIL -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Largemouth Bass	408.3	100	0.00	0	408.30	80.78
Tangerine Darter	0.0	0	97.13	100	97.13	19.22

----- RIVER=Nolichucky River Lower MONTH=MAY -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Rock Bass	0.00	0	489.79	70	489.79	66.29
Any Sunfish	0.00	0	69.97	10	69.97	9.47
Bluegill	39.15	100	0.00	0	39.15	5.30
White Crappie	0.00	0	69.97	10	69.97	9.47
Freshwater Drum	0.00	0	69.97	10	69.97	9.47

----- RIVER=Nolichucky River Lower MONTH=JUNE -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Moxostoma spp.	0.00	0.00	90.73	4.76	90.73	2.68
Channel Catfish	245.80	16.67	0.00	0.00	245.80	7.27
Redbreast Sunfish	0.00	0.00	90.73	4.76	90.73	2.68
Redear Sunfish	122.90	8.33	0.00	0.00	122.90	3.64
Smallmouth Bass	983.21	66.67	1542.38	80.95	2525.59	74.72
Spotted Bass	122.90	8.33	0.00	0.00	122.90	3.64
Largemouth Bass	0.00	0.00	90.73	4.76	90.73	2.68
Sauger	0.00	0.00	90.73	4.76	90.73	2.68

----- RIVER=Nolichucky River Lower MONTH=JULY -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Any Catfish	0.00	0	346.72	20	346.72	16.05
Channel Catfish	426.44	100	1386.86	80	1813.30	83.95

EXPANDED SPECIES COMPOSITION ESTIMATES FOR THE NUMBER OF
FISH HARVESTED, THE NUMBER OF FISH RELEASED, AND THE TOTAL CATCH
DATA ARE GIVEN BY MONTH
INCLUDED ARE PERCENT OF THE RESPECTIVE COMPOSITIONS

----- RIVER=Nolichucky River Lower MONTH=AUGUST -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Any Gar	0.00	0.00	41.53	1.61	41.53	1.59
Carp	0.00	0.00	41.53	1.61	41.53	1.59
Channel Catfish	14.58	45.45	83.07	3.23	97.65	3.75
Flathead Catfish	8.75	27.27	0.00	0.00	8.75	0.34
Rock Bass	0.00	0.00	664.53	25.81	664.53	25.49
Any Sunfish	0.00	0.00	207.67	8.06	207.67	7.97
Smallmouth Bass	8.75	27.27	1536.73	59.68	1545.48	59.28

----- RIVER=Nolichucky River Lower MONTH=SEPTEMBER -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVESTED	NUMBER RELEASED	PERCENT COMP RELEASED	NUMBER CAUGHT	PERCENT COMP CATCH
Flathead Catfish	33.95	10.71	3.78	0.32	37.73	2.51
Rock Bass	33.95	10.71	18.92	1.59	52.87	3.51
Redbreast Sunfish	22.63	7.14	22.70	1.91	45.33	3.01
Bluegill	11.32	3.57	34.05	2.87	45.37	3.01
Smallmouth Bass	101.85	32.14	885.28	74.52	987.14	65.60
Spotted Bass	22.63	7.14	102.15	8.60	124.78	8.29
Largemouth Bass	0.00	0.00	121.06	10.19	121.06	8.05
White Crappie	33.95	10.71	0.00	0.00	33.95	2.26
Black Crappie	56.59	17.86	0.00	0.00	56.59	3.76

EXPANDED SPECIES COMPOSITION FOR THE ENTIRE SAMPLING PERIOD
 INCLUDING THE NUMBER OF FISHES HARVESTED, RELEASED, AND CAUGHT
 FOR REGION 4 STREAMS 2006
 INCLUDED ARE PERCENTAGES OF THE RESPECTIVE COMPOSITIONS

----- RIVER=Pigeon River -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVEST	NUMBER RELEASED	PERCENT COMP RELEASE	NUMBER CAUGHT	PERCENT COMP CATCH
Carp	0.00	0.00	221.90	1.16	221.90	0.96
Smallmouth Buffalo	96.09	2.44	0.00	0.00	96.09	0.42
Moxostoma spp.	0.00	0.00	20.13	0.10	20.13	0.09
Any Catfish	0.00	0.00	470.79	2.45	470.79	2.03
Channel Catfish	785.18	19.96	202.29	1.05	987.46	4.27
Rainbow Trout	0.00	0.00	3163.37	16.47	3163.37	13.67
White Bass	16.73	0.43	998.33	5.20	1015.06	4.39
Rock Bass	166.24	4.23	1991.95	10.37	2158.19	9.33
Any Sunfish	0.00	0.00	1423.92	7.42	1423.92	6.15
Redbreast Sunfish	0.00	0.00	248.38	1.29	248.38	1.07
Green Sunfish	0.00	0.00	107.95	0.56	107.95	0.47
Bluegill	0.00	0.00	415.97	2.17	415.97	1.80
Redear Sunfish	96.09	2.44	0.00	0.00	96.09	0.42
Smallmouth Bass	0.00	0.00	6810.95	35.47	6810.95	29.44
Spotted Bass	0.00	0.00	6.92	0.04	6.92	0.03
Largemouth Bass	0.00	0.00	590.53	3.08	590.53	2.55
White Crappie	0.00	0.00	26.99	0.14	26.99	0.12
Black Crappie	96.09	2.44	0.00	0.00	96.09	0.42
Logperch	0.00	0.00	26.99	0.14	26.99	0.12
Sauger	0.00	0.00	1244.87	6.48	1244.87	5.38
Walleye	2418.15	61.47	893.54	4.65	3311.70	14.31
Freshwater Drum	259.37	6.59	335.79	1.75	595.16	2.57

EXPANDED SPECIES COMPOSITION FOR THE ENTIRE SAMPLING PERIOD
 INCLUDING THE NUMBER OF FISHES HARVESTED, RELEASED, AND CAUGHT
 FOR REGION 4 STREAMS 2006
 INCLUDED ARE PERCENTAGES OF THE RESPECTIVE COMPOSITIONS

----- RIVER=Nolichucky River Upper -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVEST	NUMBER RELEASED	PERCENT COMP RELEASE	NUMBER CAUGHT	PERCENT COMP CATCH
Stoneroller	0.00	0.00	454.86	3.91	454.86	3.22
Carp	34.09	1.35	302.45	2.60	336.54	2.38
River Chub	0.00	0.00	181.98	1.57	181.98	1.29
Notropis spp.	0.00	0.00	60.66	0.52	60.66	0.43
Moxostoma spp.	0.00	0.00	718.51	6.18	718.51	5.08
Golden Redhorse	19.34	0.77	0.00	0.00	19.34	0.14
Channel Catfish	252.51	10.01	186.45	1.60	438.96	3.10
Flathead Catfish	172.67	6.84	120.96	1.04	293.64	2.08
Rainbow Trout	954.95	37.85	271.08	2.33	1226.03	8.67
Rock Bass	221.82	8.79	1674.83	14.41	1896.65	13.41
Any Sunfish	344.82	13.67	1271.65	10.94	1616.47	11.43
Redbreast Sunfish	58.03	2.30	151.62	1.30	209.65	1.48
Bluegill	185.66	7.36	845.63	7.27	1031.28	7.29
Smallmouth Bass	279.37	11.07	4693.90	40.38	4973.27	35.15
Spotted Bass	0.00	0.00	505.86	4.35	505.86	3.58
Largemouth Bass	0.00	0.00	183.43	1.58	183.43	1.30

EXPANDED SPECIES COMPOSITION FOR THE ENTIRE SAMPLING PERIOD
 INCLUDING THE NUMBER OF FISHES HARVESTED, RELEASED, AND CAUGHT
 FOR REGION 4 STREAMS 2006
 INCLUDED ARE PERCENTAGES OF THE RESPECTIVE COMPOSITIONS

----- RIVER=Nolichucky River Lower -----

SPECIES	NUMBER HARVESTED	PERCENT COMP HARVEST	NUMBER RELEASED	PERCENT COMP RELEASE	NUMBER CAUGHT	PERCENT COMP CATCH
Any Gar	0.00	0.00	41.53	0.51	41.53	0.38
Carp	0.00	0.00	41.53	0.51	41.53	0.38
Moxostoma spp.	0.00	0.00	90.73	1.11	90.73	0.83
Any Catfish	0.00	0.00	346.72	4.23	346.72	3.18
Channel Catfish	686.82	25.46	1469.93	17.93	2156.75	19.79
Flathead Catfish	42.70	1.58	3.78	0.05	46.48	0.43
Rock Bass	33.95	1.26	1173.24	14.31	1207.19	11.08
Any Sunfish	0.00	0.00	277.64	3.39	277.64	2.55
Redbreast Sunfish	22.63	0.84	113.43	1.38	136.06	1.25
Bluegill	50.47	1.87	34.05	0.42	84.52	0.78
Redear Sunfish	122.90	4.56	0.00	0.00	122.90	1.13
Smallmouth Bass	1093.81	40.55	3964.40	48.35	5058.21	46.42
Spotted Bass	145.53	5.39	102.15	1.25	247.68	2.27
Largemouth Bass	408.30	15.14	211.79	2.58	620.09	5.69
White Crappie	33.95	1.26	69.97	0.85	103.92	0.95
Black Crappie	56.59	2.10	0.00	0.00	56.59	0.52
Tangerine Darter	0.00	0.00	97.13	1.18	97.13	0.89
Sauger	0.00	0.00	90.73	1.11	90.73	0.83
Freshwater Drum	0.00	0.00	69.97	0.85	69.97	0.64

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
 THE CREEL IN 1-INCH LENGTH GROUPS
 EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
 OF INTEGERS

----- RIVER=Pigeon River SPECIES=Smallmouth Buffalo -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
17	,***** \$fffffffffffffffffffffffffffffffff^	1	1	100.00	100.00
	1				

Frequency

----- RIVER=Pigeon River SPECIES=Channel Catfish -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
14	,*****	1	1	7.69	7.69
15	,*****	4	5	30.77	38.46
16	,*****	1	6	7.69	46.15
17	,*****	2	8	15.38	61.54
18	,*****	2	10	15.38	76.92
19	,*****	1	11	7.69	84.62
20	,*****	1	12	7.69	92.31
23	,*****	1	13	7.69	100.00
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	1 2 3 4				

Frequency

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
THE CREEL IN 1-INCH LENGTH GROUPS
EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
OF INTEGERS

----- RIVER=Pigeon River SPECIES=White Bass -----

SIZE CLASS		Cum.		Percent	Cum. Percent
		Freq	Freq		
11	,***** Šfffffffffffffffffffffffffffffffff^ 1	1	1	100.00	100.00

Frequency

----- RIVER=Pigeon River SPECIES=Rock Bass -----

SIZE CLASS		Cum.		Percent	Cum. Percent
		Freq	Freq		
7	,*****	5	5	41.67	41.67
8	,***** Šffff^ffff^ffff^ffff^ffff^ffff^ 1 2 3 4 5 6 7	7	12	58.33	100.00

Frequency

----- RIVER=Pigeon River SPECIES=Bluegill -----

SIZE CLASS		Cum.		Percent	Cum. Percent
		Freq	Freq		
9	,***** Šfffffffffffffffffffffffffffffffff^ 1	1	1	100.00	100.00

Frequency

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
THE CREEL IN 1-INCH LENGTH GROUPS
EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
OF INTEGERS

----- RIVER=Pigeon River SPECIES=Redear Sunfish -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
9	,***** \$fffffffffffffffffffffffffffffffff^ 1	1	1	100.00	100.00

Frequency

----- RIVER=Pigeon River SPECIES=Black Crappie -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
12	,***** \$fffffffffffffffffffffffffffffffff^ 1	1	1	100.00	100.00

Frequency

----- RIVER=Pigeon River SPECIES=Walleye -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
16	,*****	1	1	20.00	20.00
17	,*****	1	2	20.00	40.00
20	,*****	1	3	20.00	60.00
21	,***** \$fffffffffffffffff^fffffffffffffffff^ 1 2	2	5	40.00	100.00

Frequency

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
 THE CREEL IN 1-INCH LENGTH GROUPS
 EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
 OF INTEGERS

----- RIVER=Pigeon River SPECIES=Freshwater Drum -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
12	,*****	1	1	25.00	25.00
15	,*****	1	2	25.00	50.00
17	,*****	2	4	50.00	100.00
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	1 2				

Frequency

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
 THE CREEL IN 1-INCH LENGTH GROUPS
 EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
 OF INTEGERS

----- RIVER=Nolichucky River Upper SPECIES=Carp -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
14	,*****	1	1	100.00	100.00
	Šfffffffffffffffff^				
	1				

Frequency

----- RIVER=Nolichucky River Upper SPECIES=Golden Redhorse -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
15	,*****	1	1	100.00	100.00
	Šfffffffffffffffff^				
	1				

Frequency

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
THE CREEL IN 1-INCH LENGTH GROUPS
EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
OF INTEGERS

----- RIVER=Nolichucky River Upper SPECIES=Channel Catfish -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
8	,*****	1	1	20.00	20.00
16	,*****	1	2	20.00	40.00
21	,*****	1	3	20.00	60.00
22	,*****	1	4	20.00	80.00
23	,*****	1	5	20.00	100.00
	Šfff^				
		1			

Frequency

----- RIVER=Nolichucky River Upper SPECIES=Flathead Catfish -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
14	,*****	1	1	16.67	16.67
15	,*****	1	2	16.67	33.33
18	,*****	1	3	16.67	50.00
19	,*****	1	4	16.67	66.67
20	,*****	1	5	16.67	83.33
33	,*****	1	6	16.67	100.00
	Šfff^				
		1			

Frequency

----- RIVER=Nolichucky River Upper SPECIES=Rainbow Trout -----

Frequency

Frequency

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
THE CREEL IN 1-INCH LENGTH GROUPS
EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
OF INTEGERS

----- RIVER=Nolichucky River Upper SPECIES=Any Sunfish -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
8	,***** \$fffffffffffffffffffffffffffffffff^ 1	1	1	100.00	100.00

Frequency

----- RIVER=Nolichucky River Upper SPECIES=Redbreast Sunfish -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
6	,***** \$fffffffffffffffff^	1	1	33.33	33.33
7	,***** \$fffffffffffffffff^	2	3	66.67	100.00

Frequency

----- RIVER=Nolichucky River Upper SPECIES=Bluegill -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
7	,***** \$fffffffffffffffff^	2	2	100.00	100.00

Frequency

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
 THE CREEL IN 1-INCH LENGTH GROUPS
 EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
 OF INTEGERS

----- RIVER=Nolichucky River Upper SPECIES=Smallmouth Bass -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
8	,*****	1	1	3.57	3.57
9	,*****	3	4	10.71	14.29
10	,*****	8	12	28.57	42.86
11	,*****	4	16	14.29	57.14
12	,*****	4	20	14.29	71.43
13	,*****	3	23	10.71	82.14
14	,*****	2	25	7.14	89.29
15	,*****	1	26	3.57	92.86
16	,*****	1	27	3.57	96.43
17	,*****	1	28	3.57	100.00

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 1 2 3 4 5 6 7 8

Frequency

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
THE CREEL IN 1-INCH LENGTH GROUPS
EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
OF INTEGERS

----- RIVER=Nolichucky River Lower SPECIES=Channel Catfish -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
10	,*****	1	1	8.33	8.33
13	,*****	1	2	8.33	16.67
16	,*****	1	3	8.33	25.00
17	,*****	3	6	25.00	50.00
18	,*****	1	7	8.33	58.33
19	,*****	2	9	16.67	75.00
20	,*****	3	12	25.00	100.00
	Šfffffffff~fffffffff~fffffffff^				
	1 2 3				
	Frequency				

----- RIVER=Nolichucky River Lower SPECIES=Flathead Catfish -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
13	,*****	1	1	16.67	16.67
14	,*****	1	2	16.67	33.33
16	,*****	1	3	16.67	50.00
18	,*****	3	6	50.00	100.00
	Šfffffffff~fffffffff~fffffffff^				
	1 2 3				
	Frequency				

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
THE CREEL IN 1-INCH LENGTH GROUPS
EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
OF INTEGERS

----- RIVER=Nolichucky River Lower SPECIES=Rock Bass -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
6	, *****	1	1	33.33	33.33
7	, *****	1	2	33.33	66.67
8	, *****	1	3	33.33	100.00
	Šfff^				
	1				

Frequency

----- RIVER=Nolichucky River Lower SPECIES=Redbreast Sunfish -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
8	, *****	1	1	50.00	50.00
9	, *****	1	2	50.00	100.00
	Šfff^				
	1				

Frequency

----- RIVER=Nolichucky River Lower SPECIES=Bluegill -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
7	, *****	1	1	100.00	100.00
	Šfff^				
	1				

Frequency

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
THE CREEL IN 1-INCH LENGTH GROUPS
EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
OF INTEGERS

----- RIVER=Nolichucky River Lower SPECIES=Redear Sunfish -----

SIZE CLASS		Cum.		Percent	Cum. Percent
		Freq	Freq		
8	,***** Šfffffffffffffffffffffffffffffffff^ 1	1	1	100.00	100.00

Frequency

----- RIVER=Nolichucky River Lower SPECIES=Smallmouth Bass -----

SIZE CLASS		Cum.		Percent	Cum. Percent
		Freq	Freq		
7	,*****	1	1	5.00	5.00
9	,*****	1	2	5.00	10.00
10	,*****	2	4	10.00	20.00
11	,*****	5	9	25.00	45.00
12	,*****	4	13	20.00	65.00
13	,*****	2	15	10.00	75.00
15	,*****	3	18	15.00	90.00
16	,*****	1	19	5.00	95.00
18	,*****	1	20	5.00	100.00
	Šffff^ffff^ffff^ffff^ffff^ 1 2 3 4 5				

Frequency

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
THE CREEL IN 1-INCH LENGTH GROUPS
EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
OF INTEGERS

----- RIVER=Nolichucky River Lower SPECIES=Spotted Bass -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
9	,*****	1	1	33.33	33.33
12	,*****	1	2	33.33	66.67
15	,*****	1	3	33.33	100.00
	Šfffffffffffffffffffffffffffffffff^				
		1			

Frequency

----- RIVER=Nolichucky River Lower SPECIES=Largemouth Bass -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
18	,*****	1	1	100.00	100.00
	Šfffffffffffffffffffffffffffffffff^				
		1			

Frequency

----- RIVER=Nolichucky River Lower SPECIES=White Crappie -----

SIZE CLASS		Freq	Cum. Freq	Percent	Cum. Percent
11	,*****	3	3	100.00	100.00
	Šfffffffff^fffffffff^fffffffff^				
		1 2 3			

Frequency

LENGTH FREQUENCY DISTRIBUTION OF FISHES MEASURED IN
 THE CREEL IN 1-INCH LENGTH GROUPS
 EACH INCH-GROUP INCLUDES FISH WITHIN + OR - 1/2-INCH
 OF INTEGERS

----- RIVER=Nolichucky River Lower SPECIES=Black Crappie -----

SIZE CLASS		Cum.		Cum.	
		Freq	Freq	Percent	Percent
9	,*****	1	1	20.00	20.00
10	,*****	4	5	80.00	100.00
Sffffffff^ffffffff^ffffffff^ffffffff^					
	1 2 3 4				
Frequency					

EXPANDED ESTIMATES OF ANGLER EXPENDITURES
 FOR REGION 4 RIVERS 2006
 ESTIMATES BY MONTH FROM MEDIAN PER-TRIP EXPENDITURES
 AND SUMMED FOR SURVEY LONG ECONOMIC EXPENDITURES

----- RIVER=Pigeon River -----

MONTH	FIXED DAILY EXPENDITURES	NUMBER OF INTERVIEWS
APRIL	\$6,394.95	23
MAY	\$17,417.84	53
JUNE	\$27,559.01	44
JULY	\$41,586.44	63
AUGUST	\$4,544.80	29
SEPTEMBER	\$65,327.78	18

RIVER	\$162,830.83	

----- RIVER=Nolichucky River Upper -----

MONTH	FIXED DAILY EXPENDITURES	NUMBER OF INTERVIEWS
APRIL	\$16,684.31	41
MAY	\$25,136.38	63
JUNE	\$58,185.43	69
JULY	\$15,350.25	60
AUGUST	\$19,878.97	33
SEPTEMBER	\$13,386.90	16

RIVER	\$148,622.25	

----- RIVER=Nolichucky River Lower -----

MONTH	FIXED DAILY EXPENDITURES	NUMBER OF INTERVIEWS
APRIL	\$5,740.48	13
MAY	\$4,871.35	15
JUNE	\$25,051.79	23
JULY	\$3,547.92	14
AUGUST	\$2,804.70	18
SEPTEMBER	\$3,893.98	10

RIVER	\$45,910.23	
	=====	
	\$357,363.30	

EXPANDED ESTIMATES OF ANGLER EXPENDITURES
FOR REGION 4 RIVERS 2006
VALUES ARE ESTIMATED FOR TARGET SPECIES AND SUMMED FOR
A TOTAL VALUE
ESTIMATES WERE CALCULATED FOR THE MEDIAN TRIP DOLLAR VALUES

----- RIVER=Pigeon River -----

INTEND	FIXED DAILY EXPENDITURES	NUMBER OF INTERVIEWS
Carp	\$303.03	1
Any Catfish	\$8,181.80	17
Rainbow Trout	\$8,863.62	4
Rock Bass	\$1,454.54	2
Smallmouth Bass	\$109,696.72	102
Walleye	\$181.82	2
Any Species	\$40,515.06	99
SMB and Catfish	\$3,409.08	2
SMB and Rainbow Trt	\$606.06	1
-----	-----	-----
RIVER	\$173,211.72	

----- RIVER=Nolichucky River Upper -----

INTEND	FIXED DAILY EXPENDITURES	NUMBER OF INTERVIEWS
Any Catfish	\$15,601.03	36
Rainbow Trout	\$8,432.99	11
Any Sunfish	\$843.30	1
Any Black Bass	\$1,510.91	2
Smallmouth Bass	\$42,446.03	84
Any Species	\$59,874.21	140
SMB and Catfish	\$1,827.15	2
SMB and Rainbow Trt	\$1,054.12	6
-----	-----	-----
RIVER	\$131,589.73	

----- RIVER=Nolichucky River Lower -----

INTEND	FIXED DAILY EXPENDITURES	NUMBER OF INTERVIEWS
Any Catfish	\$3,977.75	17
Any Black Bass	\$5,469.41	4
Smallmouth Bass	\$14,687.09	47
White Crappie	\$91.79	1
Any Species	\$6,119.62	19
SMB and Catfish	\$1,652.30	5
-----	-----	-----
RIVER	\$31,997.96	

----- RIVER=Nolichucky River Lower -----
(continued)

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\$336,799.42

----- RIVER=Pigeon River -----

STATE

STATE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
TN	207	90.00	207	90.00
NC	10	4.35	217	94.35
SC	3	1.30	220	95.65
FL	2	0.87	222	96.52
KY	2	0.87	224	97.39
TX	2	0.87	226	98.26
CT	1	0.43	227	98.70
GA AL	1	0.43	228	99.13
IL	1	0.43	229	99.57
VA AL	1	0.43	230	100.00

----- RIVER=Nolichucky River Upper -----

STATE

STATE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
TN	268	95.04	268	95.04
NC	9	3.19	277	98.23
VA	2	0.71	279	98.94
GA	1	0.35	280	99.29
NC GA FL	1	0.35	281	99.65
SC	1	0.35	282	100.00

DISTRIBUTION OF STATES OF ORIGIN FOR ANGLERS WHO
FISHED ON REGION 4 RIVERS 2006
MULTIPLE STATES INDICATE MULTIPLE RECORDINGS WITHIN A SINGLE
FIELD IN THE DATA SET WHERE PARTY NUMBER WAS > 1

----- RIVER=Nolichucky River Lower -----

The FREQ Procedure

STATE

STATE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
TT				
TN	88	94.62	88	94.62
AL	2	2.15	90	96.77
NC	1	1.08	91	97.85
SC	1	1.08	92	98.92
TN KY	1	1.08	93	100.00

DISTRIBUTION OF COUNTIES OF ORIGIN FOR ANGLERS WHO
FISHED ON REGION 4 RIVERS 2006
MULTIPLE COUNTIES INDICATE MULTIPLE RECORDINGS WITHIN A SINGLE
FIELD IN THE DATA SET WHERE PARTY NUMBER WAS > 1

----- RIVER=Pigeon River -----

The FREQ Procedure

COUNTY

COUNTY	Frequency	Percent	Cumulative Frequency	Cumulative Percent
TT				
Cocke	159	76.81	159	76.81
Jefferson	13	6.28	172	83.09
Sevier	7	3.38	179	86.47
Knox	6	2.90	185	89.37
Greene	5	2.42	190	91.79
Hamblen	5	2.42	195	94.20
Blount	2	0.97	197	95.17
Cocke	1	0.48	198	95.65
Cocke and Hawkins	1	0.48	199	96.14
Davidson	1	0.48	200	96.62
Hamilton	1	0.48	201	97.10
Hawkins	1	0.48	202	97.58
Jefferson,Sevier	1	0.48	203	98.07
Jefferson/Grainger	1	0.48	204	98.55
Putnam	1	0.48	205	99.03
Sumner	1	0.48	206	99.52
Washington	1	0.48	207	100.00

Frequency Missing = 23

DISTRIBUTION OF COUNTIES OF ORIGIN FOR ANGLERS WHO
FISHED ON REGION 4 RIVERS 2006
MULTIPLE COUNTIES INDICATE MULTIPLE RECORDINGS WITHIN A SINGLE
FIELD IN THE DATA SET WHERE PARTY NUMBER WAS > 1

----- RIVER=Nolichucky River Upper -----

The FREQ Procedure

COUNTY

COUNTY	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Unicoi	97	35.93	97	35.93
Washington	68	25.19	165	61.11
Washington	41	15.19	206	76.30
Greene	28	10.37	234	86.67
Sullivan	17	6.30	251	92.96
Carter	8	2.96	259	95.93
Buncombe	1	0.37	260	96.30
Hawkins	1	0.37	261	96.67
Humphreys	1	0.37	262	97.04
Limestone	1	0.37	263	97.41
Madison	1	0.37	264	97.78
Sevier	1	0.37	265	98.15
Sullivan Hawkins	1	0.37	266	98.52
Washington Sullivan	1	0.37	267	98.89
Washington, Greene	1	0.37	268	99.26
Washington, Greene, Hamblen	1	0.37	269	99.63
Wilson	1	0.37	270	100.00

Frequency Missing = 12

DISTRIBUTION OF COUNTIES OF ORIGIN FOR ANGLERS WHO
FISHED ON REGION 4 RIVERS 2006
MULTIPLE COUNTIES INDICATE MULTIPLE RECORDINGS WITHIN A SINGLE
FIELD IN THE DATA SET WHERE PARTY NUMBER WAS > 1

----- RIVER=Nolichucky River Lower -----

The FREQ Procedure

COUNTY

COUNTY	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Greene	57	63.33	57	63.33
Hamblen	9	10.00	66	73.33
Cocke	6	6.67	72	80.00
Jefferson	4	4.44	76	84.44
Unicoi	4	4.44	80	88.89
Grainger	2	2.22	82	91.11
Knox	2	2.22	84	93.33
Hamblen/Jefferson	1	1.11	85	94.44
Lauderdale	1	1.11	86	95.56
Madison	1	1.11	87	96.67
Scott	1	1.11	88	97.78
Washington	1	1.11	89	98.89
Washington/Unicoi	1	1.11	90	100.00

Frequency Missing = 3

DESCRIPTIVE STATISTICS OF MILES TRAVELED FOR ANGLERS WHO
FISHED ON REGION 4 RIVERS 2006

----- RIVER=Pigeon River -----

The MEANS Procedure

Analysis Variable : MILES

N	Mean	Std Dev	Minimum	Maximum
230	21.6184783	49.1567300	0	500.0000000

----- RIVER=Nolichucky River Upper -----

Analysis Variable : MILES

N	Mean	Std Dev	Minimum	Maximum
282	19.0792553	37.6126304	0	400.0000000

----- RIVER=Nolichucky River Lower -----

Analysis Variable : MILES

N	Mean	Std Dev	Minimum	Maximum
93	18.3397849	34.9772127	0.1000000	283.0000000

DISTRIBUTION OF RESPONSES TO OPINION QUESTION 1:
 "HOW WELL DO YOU FEEL THE TWRA IN MANAGING WARMWATER STREAMS?"
 1 = POOR 5 = EXCELLENT
 RESPONSES WERE ROUNDED DOWN TO WHOLE INTEGERS TO ENSURE
 CATEGORICAL RESPONSES

----- RIVER=Pigeon River -----

The FREQ Procedure

OPINION1

OPINION1	Frequency	Percent
ffffffffffffffffffffffffffffffff		
1 POOR	3	1.30
2	6	2.61
3	32	13.91
4	120	52.17
5 EXCELLENT	69	30.00

DISTRIBUTION OF RESPONSES TO OPINION QUESTION 1:
 "HOW WELL DO YOU FEEL THE TWRA IN MANAGING WARMWATER STREAMS?"
 1 = POOR 5 = EXCELLENT
 RESPONSES WERE ROUNDED DOWN TO WHOLE INTEGERS TO ENSURE
 CATEGORICAL RESPONSES

----- RIVER=Nolichucky River Upper -----

The FREQ Procedure

OPINION1

OPINION1	Frequency	Percent
ffffffffffffffffffffffffffffffff		
1 POOR	7	2.48
2	4	1.42
3	35	12.41
4	104	36.88
5 EXCELLENT	132	46.81

DISTRIBUTION OF RESPONSES TO OPINION QUESTION 1:
 "HOW WELL DO YOU FEEL THE TWRA IN MANAGING WARMWATER STREAMS?"
 1 = POOR 5 = EXCELLENT
 RESPONSES WERE ROUNDED DOWN TO WHOLE INTEGERS TO ENSURE
 CATEGORICAL RESPONSES

----- RIVER=Nolichucky River Lower -----

The FREQ Procedure

OPINION1

OPINION1	Frequency	Percent
ffffffffffffffffffffffffffffffff		
1 POOR	1	1.08
3	18	19.35
4	50	53.76
5 EXCELLENT	24	25.81

DISTRIBUTION OF RESPONSES TO OPINION QUESTION 2
 "DO YOU BELONG TO AN ORGANIZED FISHING CLUB?"
 1 = YES 2 = NO
 RESPONSES OTHER THAN 1 OR 2 WERE OMITTED

----- RIVER=Pigeon River -----

The FREQ Procedure

OPINION2

OPINION2	Frequency	Percent
YES	16	6.99
NO	213	93.01

DISTRIBUTION OF RESPONSES TO OPINION QUESTION 2
 "DO YOU BELONG TO AN ORGANIZED FISHING CLUB?"
 1 = YES 2 = NO
 RESPONSES OTHER THAN 1 OR 2 WERE OMITTED

----- RIVER=Nolichucky River Upper -----

The FREQ Procedure

OPINION2

OPINION2	Frequency	Percent
YES	28	9.93
NO	254	90.07

DISTRIBUTION OF RESPONSES TO OPINION QUESTION 2
 "DO YOU BELONG TO AN ORGANIZED FISHING CLUB?"
 1 = YES 2 = NO
 RESPONSES OTHER THAN 1 OR 2 WERE OMITTED

----- RIVER=Nolichucky River Lower -----

The FREQ Procedure

OPINION2

OPINION2	Frequency	Percent
YES	5	5.38
NO	88	94.62

DISTRIBUTION OF RESPONSES TO OPINION QUESTION 3:
 PIGEON RIVER ONLY
 "ARE YOU SATISFIED WITH THE SMALLMOUTH BASS LENGTH REGULATION?"
 1 = YES 2 = NO

The FREQ Procedure

OPINION3

OPINION3	Frequency	Percent
YES	212	92.58
NO	17	7.42

DISTRIBUTION OF RESPONSES TO OPINION QUESTION 4:
 NOLICHUCKY RIVER ONLY
 "ARE YOU SATISFIED WITH THE CURRENT SMALLMOUTH BASS REGULATION
 (NO SIZE LIMIT, 5 FISH CREEL LIMIT)"
 1 = YES 2 = NO

----- RIVER=Nolichucky River Upper -----

The FREQ Procedure

OPINION4

OPINION4	Frequency	Percent
YES	229	81.21
NO	53	18.79

DISTRIBUTION OF RESPONSES TO OPINION QUESTION 4:
 NOLICHUCKY RIVER ONLY
 "ARE YOU SATISFIED WITH THE CURRENT SMALLMOUTH BASS REGULATION
 (NO SIZE LIMIT, 5 FISH CREEL LIMIT)"
 1 = YES 2 = NO

----- RIVER=Nolichucky River Lower -----

The FREQ Procedure

OPINION4

OPINION4	Frequency	Percent
YES	69	74.19
NO	24	25.81

FREQUENCY OF DIFFERENT FISHING METHODS FOR TARGET SPECIES
IN REGION 4 RIVERS 2006

----- RIVER=Pigeon River -----

INTEND	METHOD	FREQUENCY	Percent of Total Frequency
Carp	Stillfishing	1	100.000
Any Catfish	Stillfishing	13	76.471
Any Catfish	Spinfishing	2	11.765
Any Catfish	Stillfishing and Spinfishing	2	11.765
Rainbow Trout	Stillfishing	2	50.000
Rainbow Trout	Spinfishing	1	25.000
Rainbow Trout	Flyfishing	1	25.000
Rock Bass	Stillfishing	1	50.000
Rock Bass	Spinfishing	1	50.000
Smallmouth Bass	Stillfishing	11	10.784
Smallmouth Bass	Spinfishing	84	82.353
Smallmouth Bass	Flyfishing	4	3.922
Smallmouth Bass	Spinfishing and Flyfishing	3	2.941
Walleye	Spinfishing	2	100.000
Any Species	Stillfishing	70	70.707
Any Species	Spinfishing	23	23.232
Any Species	Flyfishing	1	1.010
Any Species	Stillfishing and Spinfishing	5	5.051
SMB and Catfish	Stillfishing	2	100.000
SMB and Rainbow Trt	Spinfishing	1	100.000

----- RIVER=Nolichucky River Upper -----

INTEND	METHOD	FREQUENCY	Percent of Total Frequency
Any Catfish	Stillfishing	32	88.889
Any Catfish	Spinfishing	2	5.556
Any Catfish	Other	2	5.556
Rainbow Trout	Stillfishing	7	63.636
Rainbow Trout	Spinfishing	3	27.273
Rainbow Trout	Flyfishing	1	9.091
Any Sunfish	Stillfishing	1	100.000
Any Black Bass	Stillfishing	1	50.000
Any Black Bass	Spinfishing	1	50.000
Smallmouth Bass	Stillfishing	22	26.190
Smallmouth Bass	Spinfishing	56	66.667
Smallmouth Bass	Flyfishing	4	4.762
Smallmouth Bass	Stillfishing and Spinfishing	1	1.190
Smallmouth Bass	Spinfishing and Flyfishing	1	1.190
Any Species	Stillfishing	104	74.820
Any Species	Spinfishing	25	17.986
Any Species	Stillfishing and Spinfishing	9	6.475
Any Species	Spinfishing and Flyfishing	1	0.719
SMB and Catfish	Stillfishing	2	100.000
SMB and Rainbow Trt	Stillfishing	5	83.333
SMB and Rainbow Trt	Spinfishing	1	16.667

FREQUENCY OF DIFFERENT FISHING METHODS FOR TARGET SPECIES
IN REGION 4 RIVERS 2006

----- RIVER=Nolichucky River Lower -----

Percent of
Total

INTEND	METHOD	FREQUENCY	Frequency
Any Catfish	Stillfishing	12	70.588
Any Catfish	Spinfishing	4	23.529
Any Catfish	Stillfishing and Spinfishing	1	5.882
Any Black Bass	Spinfishing	3	75.000
Any Black Bass	Stillfishing and Spinfishing	1	25.000
Smallmouth Bass	Stillfishing	4	8.696
Smallmouth Bass	Spinfishing	40	86.957
Smallmouth Bass	Stillfishing and Spinfishing	2	4.348
White Crappie	Spinfishing	1	100.000
Any Species	Stillfishing	12	63.158
Any Species	Spinfishing	6	31.579
Any Species	Stillfishing and Spinfishing	1	5.263
SMB and Catfish	Stillfishing	1	20.000
SMB and Catfish	Spinfishing	3	60.000
SMB and Catfish	Stillfishing and Spinfishing	1	20.000

FREQUENCY OF DIFFERENT TERMINAL TACKLE TYPES FOR TARGET SPECIES
IN REGION 4 RIVERS 2006

----- RIVER=Pigeon River -----

INTEND	TERMINAL	FREQUENCY	Percent of Total Frequency
Carp	Bait	1	100.000
Any Catfish	Bait	15	88.235
Any Catfish	Lure/Flies and Bait	2	11.765

Rainbow Trout	Lure or Flies	2	50.000
Rainbow Trout	Bait	2	50.000
Rock Bass	Lure or Flies	1	50.000
Rock Bass	Bait	1	50.000
Smallmouth Bass	Lure or Flies	68	66.667
Smallmouth Bass	Bait	31	30.392
Smallmouth Bass	Lure/Flies and Bait	3	2.941
Walleye	Bait	2	100.000
Any Species	Lure or Flies	15	15.152
Any Species	Bait	75	75.758
Any Species	Lure/Flies and Bait	9	9.091
SMB and Catfish	Bait	2	100.000
SMB and Rainbow Trt	Lure or Flies	1	100.000

----- RIVER=Nolichucky River Upper -----

INTEND	TERMINAL	FREQUENCY	Percent of Total Frequency
Any Catfish	Bait	36	100.000
Rainbow Trout	Lure or Flies	1	9.091
Rainbow Trout	Bait	8	72.727
Rainbow Trout	Lure/Flies and Bait	2	18.182
Any Sunfish	Bait	1	100.000
Any Black Bass	Lure or Flies	1	50.000
Any Black Bass	Bait	1	50.000
Smallmouth Bass	Lure or Flies	57	67.857
Smallmouth Bass	Bait	24	28.571
Smallmouth Bass	Lure/Flies and Bait	3	3.571
Any Species	Lure or Flies	14	10.000
Any Species	Bait	117	83.571
Any Species	Lure/Flies and Bait	9	6.429
SMB and Catfish	Bait	2	100.000
SMB and Rainbow Trt	Lure or Flies	2	33.333
SMB and Rainbow Trt	Bait	3	50.000
SMB and Rainbow Trt	Lure/Flies and Bait	1	16.667

FREQUENCY OF DIFFERENT TERMINAL TACKLE TYPES FOR TARGET SPECIES
IN REGION 4 RIVERS 2006

----- RIVER=Nolichucky River Lower -----

INTEND	TERMINAL	FREQUENCY	Percent of Total Frequency
Any Catfish	Bait	16	94.118
Any Catfish	Lure/Flies and Bait	1	5.882
Any Black Bass	Lure or Flies	3	75.000
Any Black Bass	Bait	1	25.000
Smallmouth Bass	Lure or Flies	30	63.830
Smallmouth Bass	Bait	9	19.149
Smallmouth Bass	Lure/Flies and Bait	8	17.021
White Crappie	Bait	1	100.000
Any Species	Lure or Flies	4	21.053
Any Species	Bait	14	73.684
Any Species	Lure/Flies and Bait	1	5.263
SMB and Catfish	Lure or Flies	2	40.000
SMB and Catfish	Bait	1	20.000
SMB and Catfish	Lure/Flies and Bait	2	40.00