

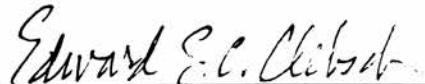
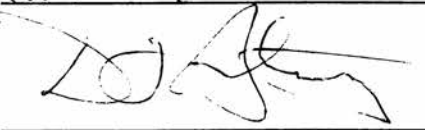
To the Graduate Council:

I am submitting herewith a dissertation written by Mark Handly Hughes entitled "The Spatial and Temporal Distribution of Fishes in the Holston River system of North Carolina, Tennessee, and Virginia". I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Zoology.



David A. Etnier, Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted for the Council:



Associate Vice Chancellor

and Dean of The Graduate School

**The Spatial and Temporal Distribution of Fishes in the Holston River System of
North Carolina, Tennessee, and Virginia.**

**A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville**

**Mark Handly Hughes
December, 1994**

DEDICATION

This dissertation is dedicated to my parents
Dr. Owen T. Hughes, Mrs. Gertrude Handly Woodruff, and George R. Woodruff.
and
to my wife and children
Lisa Goad, Rebecca Franklin, Laura Rachel, and Samuel Handly
who gave to me the love, time, and support needed to realize this goal.

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ABSTRACT

Over 1,000 fish collections from 1867 to 1994 resulted in the reporting of 134 species of fishes from the Holston River system. One-hundred thirty of those species are considered within as valid records. About 14% of those species were introduced into the system, leaving 112 indigenous species reported from the Holston River system.

Distribution of species throughout space and time is presented in tabular form in the appendices, based on the availability of collection records. Catalogued specimens are listed for 117 species.

Perturbations of species assemblages due to mercury pollution and impoundment of the Holston River system are considered. The preimpoundment and postimpoundment distribution of 134 species are covered individually. Collectively, assemblages are discussed in regard to changes induced in the watershed in the vicinity of three major impoundments to the river, Cherokee Lake, South Holston Lake, and Watauga Lake.

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LIST OF ABBREVIATIONS

AMSL		Above Mean Sea Level
Anon		Anonymous
ANSP		Academy of Natural Sciences of Philadelphia
BP	.....	Before Present
C	.....	Centigrade
cfs	.....	cubic feet per second
CO	.....	County
Cr.	.....	Creek
CU	.....	Cornell University
DO	.....	Dissolved Oxygen
E	.....	East
e.g.	.....	<i>exempli gratia</i> (L., for example)
EPA	.....	Environmental Protection Agency
et al.	.....	<i>et alii</i> (L., and others)
F	.....	Fahrenheit
FBRM	.....	French Broad River Mile
ft	.....	feet
HRM	.....	Holston River Mile
hwy	.....	highway
i.e.	.....	<i>id est</i> (L., that is)
in litt.	.....	<i>in litterarum</i> (L., in letters)
kg	.....	kilogram(s)
km	.....	kilometer(s)

l	.....	liter(s)
m	.....	meter(s)
MCZ	.....	Museum of Comparative Zoology (Harvard University)
MFHR	.....	Middle Fork Holston River
mi	.....	mile(s)
mya	.....	million years ago
N	.....	North
NARC	.....	North American Rayon Corporation
NFHR	.....	North Fork Holston River
OSUM	.....	Ohio State University Museum
pers. comm.	.....	personal communication
ppm	.....	part(s) per million
rkm	.....	riverkilometer(s)
RM	.....	Rivermile(s)
S	.....	South
SFHR	.....	South Fork Holston River
sp.	.....	species
TDC	.....	Tennessee Department of Conservation
TGFC	.....	Tennessee Game and Fish Commission
TVA	.....	The Tennessee Valley Authority
TWRA	.....	Tennessee Wildlife Resources Agency
UAIC	.....	The University of Alabama Ichthyological Collection
UMMZ	.....	University of Michigan Museum of Zoology

USNM	.....	United States National Museum
UT	.....	The University of Tennessee, Knoxville
VPI	.....	Virginia Polytechnic Institute and State University (Virginia Tech)
W	.....	West

Chapter 1

Introduction

Preface

This dissertation was undertaken to ascertain the present status of fishes in the Holston River system, based on both historical and recent fish collection records. It was not the purpose of this work to simply describe the distribution of fishes in the Holston River, but rather to describe that distribution through time. The Holston River, a medium-sized river in East Tennessee, was the primary focus of this study. Additional scrutiny was made of three headwater tributaries to the Holston River that arise in southwestern Virginia (North Fork Holston River and South Fork Holston River) and western North Carolina (Watauga River).

Assumptions and Background

Anthropogenic degradation of the aquatic habitat in North America has been discussed by Larimore and Smith (1963), Courtenay et al. (1986), Neves and Angermeier (1990), Burkhead and Jenkins (1991), Etnier and Starnes (1991, 1993), and Jenkins and Burkhead (1994). Changes in fish distribution, resulting from anthropogenic degradation, have been noted through historic time in various state distributional studies of fishes (Forbes and Richardson, 1920; Greene, 1935; Smith-Vaniz, 1968; Pflieger, 1975; Smith, 1979; Trautman, 1981; Menhinick, 1991; Etnier and Starnes, 1993; Jenkins and Burkhead, 1994). The most notable stress imposed on fishes in the Tennessee Valley was impoundment (Benke, 1990).

Impoundment presented a major stress to the Tennessee River (Pfitzer, 1954; Yeager and Tomljanovich, 1990; Etnier and Starnes, 1991). Preimpoundment and postimpoundment faunas in the Tennessee River system are sufficiently different to be recognizable as separate assemblages. Medium-sized as well as large rivers in the Tennessee River Valley were surveyed for fishes prior to impoundment, primarily by the TVA (Etnier et al., 1979), but those TVA collections were not exhaustive, and preimpoundment distribution of fishes in those rivers went largely unreported. Species richness and evenness of fishes may never be known for most medium-sized river systems in the Tennessee River Valley.

This dissertation discusses specific changes in the species richness of fishes in the Holston River system. This system has suffered severe anthropogenic abuses in North Carolina, Tennessee, and Virginia (Lyman and Dendy, 1943; Pfitzer, 1954; Hill et al., 1975, 1989; USEPA 1978; Division of Water Quality Control, 1977, 1978; Milligan et al., 1979; Feeman, 1980; Hildebrand et al., 1980a; Cox, 1986; Saylor et al., 1988; Saylor and Ahlstedt, 1990; Yeager and Tomljanovich, 1990; Jenkins and Burkhead, 1994).

To study the effects of historic temporal stress on fish distribution, it was necessary to reconstruct the spatial distribution of fishes over time within that system. Data relating to fish collections in the Holston River were obtained from museum collections, published accounts, and ichthyological field notes. It was assumed that a geochronographic distribution of fishes from that river system could be compiled from comparison of data between historic and recent fish collections. Thus, a null hypothesis for this work was formulated; *anthropogenic degradation of the Holston River system has had no effect on the natural distribution of fishes in the Holston River system.*

It must be understood what is meant by the *natural* distribution of fishes before the present distribution of fishes can be intelligently discussed. This concept of a *natural* distribution is based on my perception of a *natural order* that was overturned by the

advancement of Europeans into North America after 1492 A.D. In the post-glacial but pre-Columbian pristine wilderness, spatial regions called biomes existed (i.e., desert, grassland, taiga, tundra, or temperate forest). The biomes were dynamic assemblages, usually blending into one another where they interfaced. They were not completely homogeneous biotic entities, but they generally supported unique, recognizable combinations of plants and animals. If habitat affects the distribution of animals, then it was on this pre-Columbian landscape where the *natural* distributions of animals in North America were determined.

What affected the *natural* distribution of fishes in North America? Pre-Columbian rivers flowed virtually in an unobstructed continuum towards the sea with most river systems within each basin in communication with one another. Movement of fishes through each system was limited by natural physical and chemical barriers. A diverse aquatic fauna inhabited and adapted to those prehistoric North American waters in the absence of modern man. Under that system of influences, groups of aquatic organisms exhibited what is referred to here as a *natural* distribution. Assemblages of freshwater organisms that inhabited those pristine North American waters in 1492 A.D. were the ultimate baseline of biological integrity and diversity for that *natural* system.

How far back in time do anthropogenic perturbations in North American extend? The following thoughts were adapted from Crosby (1986). European explorers, from the Spanish conquistadors in Florida and Georgia to the English at Jamestown, Virginia, brought with them into the United States an Old World flora and fauna. Those introduced species successfully invaded the continent so completely that they appear to be native plants (e.g., nettles, plantain, white clover, Kentucky bluegrass, and peach tree) and animals (e.g., honey bee, starling, carp, and Asian clam). Cows, pigs, and horses overgrazed native plants and perturbed the landscape of the eastern United States, while Europeans worsened the situation through deforestation and cultivation. *Natural* biomes are now

obscured in the post-European era of the U.S. where new hybrid biomes derived from mixing of the Old World and New World genomes have replaced the *natural* order.

Why should we investigate the *natural* distribution of freshwater fishes in North American rivers? The world wants to know. Alarmed at the increasing rate of global extinctions, the United Nations Conference on Environment and Development in Rio De Janeiro in 1992 reached an accord that called for a global inventory of biological species, in order to protect biological integrity. The Ecological Society of America in 1993 called for cataloging and mapping of the distribution of biotic species and to link the pattern of distribution to anthropogenic processes. In 1993, a program called the Systematics Agenda 2000 (SA2000) was initiated by the American Society of Plant Taxonomists, the Society of Systematic Biologists, and the Willi Hennig Society, with the cooperation of the Association of Systematics Collections and through financial support of the U.S. National Science Foundation. The goal of SA2000 is to chart the biosphere. Interest in mapping the *natural* distributions of organisms is progressing on an international scale.

Are all problems associated with discovering the *natural* distribution of fishes in North America solvable? The answer is maybe not. If a species was not collected or observed prior to its extinction (gone from the earth forever; no longer represented by living individuals of the species) or extirpation (extermination from political or geographic region; a local population), then its presence at a particular site will probably never be known. Another potentially unsolvable problem is the distinction between cryptic and recently introduced species. If a cryptic fish was overlooked for a considerable period of active collecting effort and later detected by researchers, then that fish may be erroneously labeled as an introduced species. On the other hand, if a fish species is introduced into a river system (e.g., by a fisherman in a bait bucket), becomes established, and later discovered, then it might be incorrectly labeled a cryptic species. The *natural* distribution of fishes is not always clear from collection records.

Study Area

The description that follows is of the Holston River proper and four principal tributaries of the upper Holston River system. The French Broad and Holston rivers intersect at Knoxville, Tennessee, in Knox County to form the Tennessee River proper (Figure 1). The Holston River system has a watershed of 9,780 km² (3,776 mi²) and a mean annual flow of 4,691 cfs at the confluence with the French Broad River.

The North Fork Holston River (NFHR) and the South Fork Holston River (SFHR) merge in Kingsport, Tennessee, at the Hawkins/Sullivan county lines, forming the Holston River proper in the Ridge and Valley physiographic province, an area of southwesterly directed ridges and valleys. The soil in the Ridge and Valley is highly leached and strongly acidic with clay enriched subsoil (Cox, 1986). The Holston River proper flows 228.4 km (142 mi) from Kingsport, Tennessee, to Knoxville, Tennessee, across Paleozoic limestone, sandstone, and shales. The substrate is dominated by a limestone bedrock, formed from deposition of lime (calcium carbonate) in shallow seas during the Ordovician period. Riffle areas of the Holston River proper are characterized by bedrock that is either bare or covered with any combination of silt, sand, gravel, cobble, and boulders. Pools and runs have similar substrate but tend to have a greater accumulation of finer particles such as sand, silt, or mud. The Holston River once flowed unobstructed from its source at Kingsport to its mouth at Knoxville. In 1941 that continuity was broken by the construction of Cherokee Dam at HRM 52.3, which resulted in Cherokee Lake, a TVA storage reservoir that floods approximately one-third of the linear distance of the Holston River proper. Since completion of Cherokee Dam in 1941, the Holston River continuum was disrupted and divided into three distinct regions, identifiable by both physical parameters and ichthyofauna. Those three regions are Cherokee Lake (HRM 52.3 to 109),

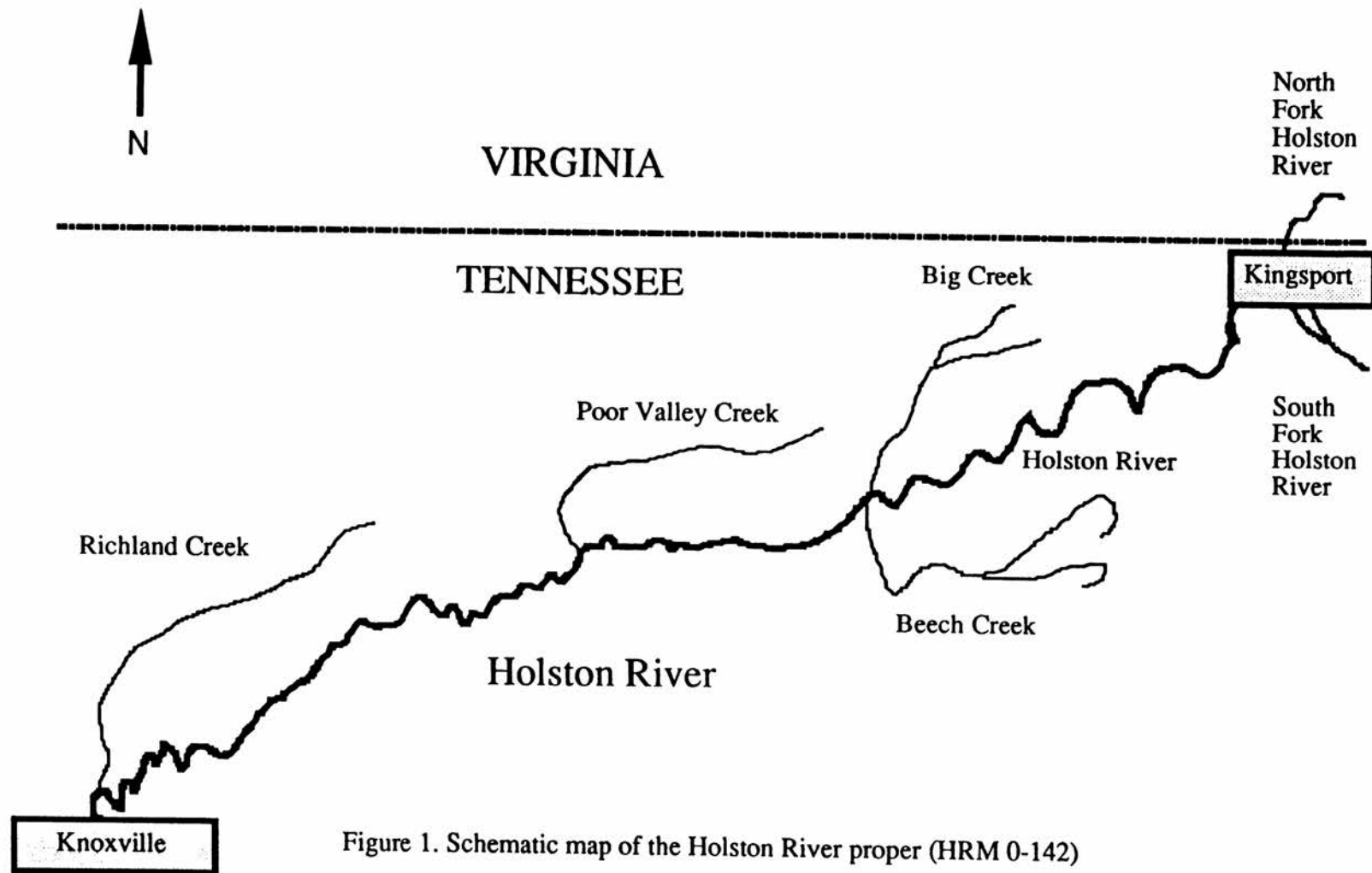


Figure 1. Schematic map of the Holston River proper (HRM 0-142) from Kingsport to Knoxville, Tennessee.

Cherokee tailwaters downstream from Cherokee Dam (HRM 0 to 52.3), and the Holston River upstream from Cherokee Lake (HRM 109 to HRM 142).

The first of those three regions, Cherokee Lake, is discussed here. Cherokee Dam is located at HRM 52.3. Depending on its water level, the headwater boundary of the reservoir fluctuates between HRM 82.3 and 108.3 (USEPA, 1978) — sometimes reaching the John Sevier Detention Dam. The ordinary minimum elevation of Cherokee Lake water at full pool (summer) is 299 m (980 ft) above mean sea level (AMSL). USEPA (1978) reports that Cherokee Lake has a storage volume of $1,900.8 \times 10^6 \text{ m}^3$. It is moderately deep for a TVA storage reservoir with a maximum depth of 49.7 m (163.1 ft).

The second region of the Holston River proper, Cherokee tailwaters, reaches from Cherokee Dam (HRM 52.3) to the French Broad River (HRM 0). According to Hill and Brown (1980), the Holston River proper downstream from Cherokee Dam has an average gradient of .21 m/km (1.1 ft/mi), width of 91.5 m (300 ft), and depth of 1.3 m (4.3 ft); the substrate is composed of 15% bedrock, 5% boulders, 40% rubble, 25% gravel, and 15% sand and silt (Hill and Brown, 1980).

This section of river was once free flowing, but now is dependent on releases from the storage reservoir for most of its water. From 1902 to 1943, unregulated flow at the Cherokee Dam site averaged 4,600 cfs (Hill and Brown, 1980). Low flow in the Holston River downstream from Cherokee Dam has been a problem since the dam was closed on December 5, 1941. The lowest flow recorded in the Cherokee tailwaters was 44 cfs, just after closure (December 21-22, 1941) at HRM 5.5 (Lowery et al., 1988). Downstream from the dam, flow depends on the discharge through turbines, and can fluctuate between a minimum of zero to the maximum designed release of 9,500 cfs (Pfitzer, 1954). In 1949, the lowest average flow occurred in the months of June (2,089 cfs), May (2,404 cfs), and March (2,702 cfs); but during each of those months there were at least two consecutive days of zero flow through the dam (Pfitzer, 1954). The monthly average flow in 1953 was

between 4,000 and 9,000 cfs (Pfitzer, 1954). Data for average turbine discharge through Cherokee Dam was reported by Hill and Brown (1980) for 1973 (11,286 cfs), 1974 (10,858 cfs), and 1976 (12,302 cfs). Although, the average flow increased during the 1970s, Hill and Brown (1980) reported a minimum low flow between 50-100 cfs in the Cherokee tailwaters during that period. The Division of Water Quality Control (1977) reported periods of no flow in the Cherokee tailwaters as a recurring problem. In 1991 a minimum flow policy was adopted and established for Cherokee tailwaters and zero flow should no longer occur there (C.F. Saylor, pers. comm.).

Hill and Brown (1980) reported on the water temperature, pH, and dissolved oxygen (DO) recorded monthly during 1976 directly downstream from Cherokee Dam. Hill and Brown (1980) recorded the lowest temperature in January (5 °C) and the highest in August (26.0 °C), lowest pH in November (6.0) and the highest in January (7.9), and lowest DO in July (0.1 mg/l at 16 °C) and the highest in February (11.8 at 6 °C). The Division of Water Quality Control (1977) reported measurements of DO downstream from Cherokee Dam from June through October for the years 1962 to 1974. Those measurements revealed that 88% of the DO concentrations were less than 5.0 mg/l and 43% were less than 1.0 mg/l. Intermittently between 1962 and 1974, oxygen levels less than 5.0 mg/l would persist for the entire length of Cherokee tailwaters to Knoxville (Division of Water Quality Control, 1977).

The third and final segment is the Holston River proper beginning at the upper end of Cherokee Lake just downstream from John Sevier Detention Dam. The John Sevier Detention Dam has been a barrier to the upstream migration of fishes out of Cherokee Lake since 1953. The dam crosses the Holston River proper and impounds it. The Holston River proper upstream from Cherokee Lake at Surgoinsville (HRM 118) is above the effects of John Sevier Detention Reservoir and in 1977 had an average minimum flow (daily minimum flow/ number of days) of 840 cfs in October and December and a

maximum flow of 42,700 cfs in March (USEPA, 1978). The average discharge for 48 years (1940-1988) at HRM 118.7 was 3,708 cfs with a maximum discharge of 59,600 cfs on February 18, 1944, and a minimum discharge of 470 cfs on October 21, 1941 (Lowery et al., 1988). During low flow in the late summer and fall, essentially all of the stream flow in this stretch of the Holston River comes from groundwater (Division Water Quality Control, 1977). Presently, the flow of the Holston River proper upstream from Cherokee Dam is determined by a regulated minimum flow from Fort Patrick Henry Dam on the SFHR of 750 cfs and unregulated flow from NFHR (USEPA, 1978). The Holston River drops 0.6 m/km in elevation as it flows from Kingsport into Cherokee Lake (USEPA, 1978). At HRM 141.3 the average water depth is 0.85 m (2.78 feet) and the width is 144 m (471 feet) and downstream near Cherokee Lake at HRM 118.4 the depth is 2.1 m (6.8 feet) and the width is 110 m (360 feet) (Division of Water Quality Control, 1978).

ANSP (1966) recorded the average values for the following physical parameters collected from the Holston River at Smith Bend (HRM 142) over a five day period in June 1965. The mean temperature was 21 °C (69.3 °F), the mean pH was 7.5 (range of 7.3 to 7.6), and the mean DO measurement was 2.06 ppm (range of 1.30 to 3.40 ppm).

The principal towns in sequential order from northeast to southwest along the Holston River proper from Kingsport downstream are Surgoinsville, Rogersville, Morristown, Jefferson City, and Knoxville. The principal tributaries to the main channel Holston River in alphabetical order are Beaver, Beech, Big, Mossy, Lost, Panther, Poor Valley, Richland, Roseberry, Surgoinsville, Swanpond, and Terrill creeks.

The NFHR arises in the southwestern panhandle of Bland County, Virginia, flows through Smyth, Washington, and Scott counties, Virginia, and into Tennessee, along a shared border of Sullivan and Hawkins counties (Figure 2). The NFHR traverses 193 km (120 mi), draining 1,888 km² (729 mi²) in Rich Valley—which is rimmed by Clinch Mountain to the north and Walker Mountain to the south (Feeman 1986; Hill et al, 1989) .

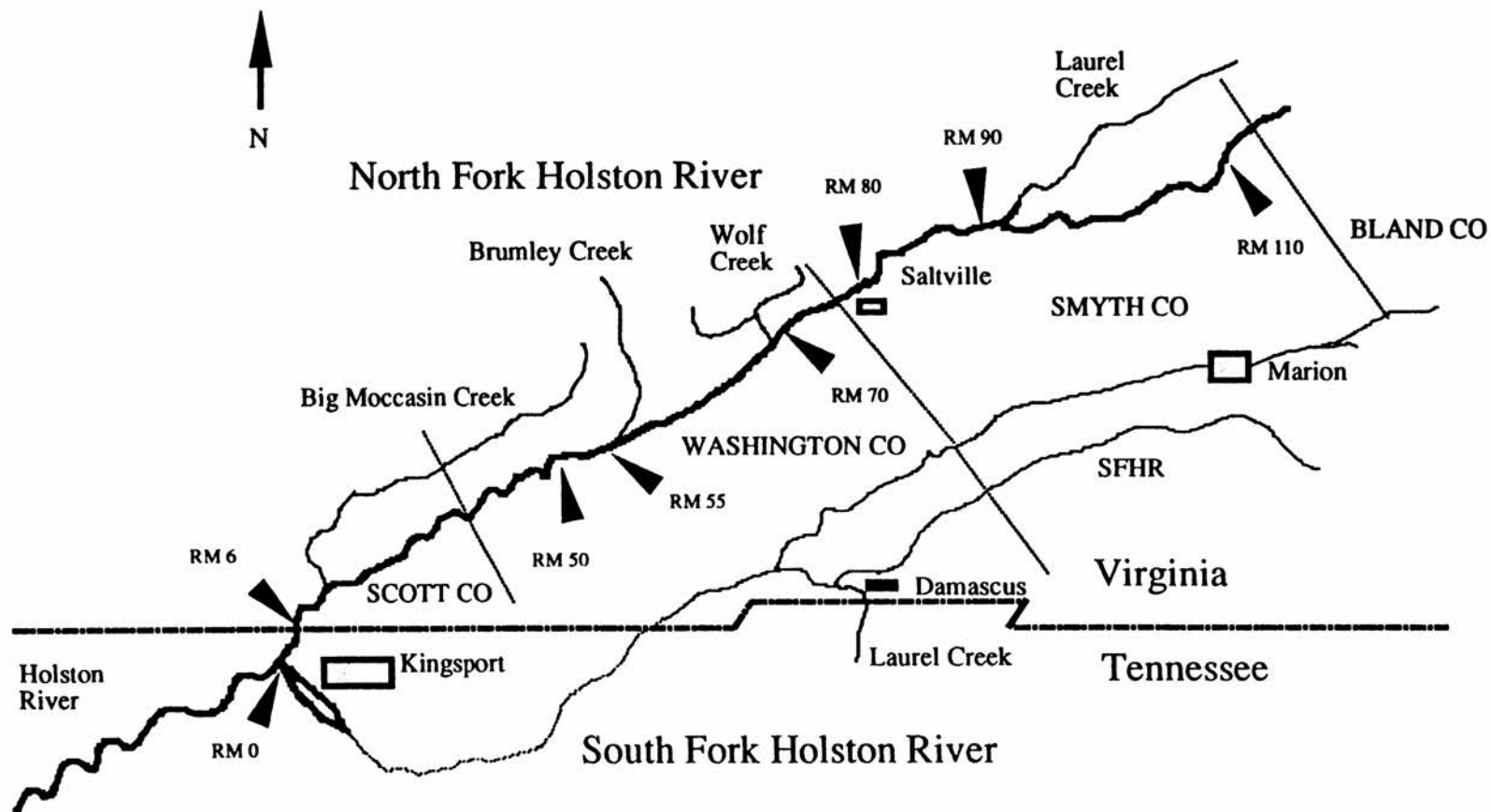


Figure 2. Schematic diagram of North Fork and South Fork Holston Rivers, showing relative locations of the major tributaries to the North Fork Holston River

The NFHR courses a southwesterly route forced by the similar alignment of these ridges, and begins its descent from an elevation of 800 m where the surrounding mountains are about 1,200 m in elevation. North of Kingsport, Tennessee, Clinch Mountain in Virginia is about 800 m in elevation and the NFHR is near 400 m in elevation. The NFHR drops about 400 m in 193 km, or 2.0 m/km. According to Feeman of TVA (1980: 16, Table 4; 1986: 5), the NFHR has an average gradient of 1.9 m/km, but the USEPA (1978: 11) reports the NFHR gradient as 1.2 m/km (6.2 ft/mi). A large discrepancy in the reported value of stream gradient in the NFHR exists, but Hildebrand et al., 1980 report that the NFHR drops 396 m from its source to the confluence with the SFHR, which agrees with my calculations and those of Feeman (1980), making the gradient about 1.9 to 2.0 m/km. From 1921 to 1957 the average flow rate of the NFHR at Saltville, Virginia, was 289 cfs (Ross, 1963). The average minimum flow for the same period was 29 cfs, and the average flow rate at the mouth of the NFHR was about three times the flow at Saltville (Hill et al., 1975).

From June 24-30, 1965, Tennessee Eastman Company (ANSP, 1965) performed 5 daily chemical analyses of the water at the mouth of the NFHR just upstream from its confluence with the SFHR, and the average measurement of DO was 7.3 ppm (7.00 - 7.7 ppm), temperature was 24.6 °C (21.7 - 26.1 °C), and pH was 7.6 (7.5 - 7.8). In August and September 1973, TVA (Feeman, 1980) measured chemical characteristics at 8 different stations from NFHR mi 6.3 progressing upstream to rivermile 93.9, and from those 8 stations the average measured value of DO was 12.1 ppm (8.3 - 16.5 ppm), temperature was 25.4 °C (23.0 - 27.0 °C), and pH was 9.0 (8.5 - 9.2).

Kingsport, Tennessee, at the mouth of the NFHR has a population of 33,860 (USEPA, 1978); Saltville, Virginia, is the only other town with a population over 1,000 people in the NFHR watershed (Feeman et al, 1980; Hill and Brown, 1980). The NFHR has suffered no major impoundments (USEPA, 1978). The montane land along the

NFHR is primarily forested. The hilly valley floor is used as farmland (Feeman, 1980; Hill and Brown, 1980). Major tributaries to the NFHR are Laurel Creek, Big Tumbling Creek, Wolf Creek, and Big Moccasin Creek.

The main channel of the SFHR originates in Smyth County, Virginia, at an elevation of 800 m and flows 182 km (113 mi), traversing Washington County, Virginia, and Sullivan County, Tennessee, (Figure 3) to a confluence with the NFHR at an elevation of 400 m. The SFHR drains 5,302 km² (2,048 mi²) over an average gradient of 2.2 m/km in the main channel (Cox, 1986). The SFHR, like the Holston River proper, is also fragmented into several segments. In Virginia, the SFHR has no TVA dams but South Holston Lake extends into Washington County. The Tennessee portion of the SFHR is heavily impounded by the TVA.

The SFHR originates in Virginia from tributaries in the Blue Ridge physiographic province, but the SFHR proper is in the Ridge and Valley physiographic province. At its source, the SFHR is situated between and drains Brushy Mountain (approximately 1000 m in elevation) to the north in the Jefferson National Forest and the Iron Mountains (1200 m in elevation) to the south in the Mount Rogers National Recreation Area. The slopes of these mountains are wooded and steep. From its source, SFHR stretches to its junction with the MFHR in Washington County, Virginia (Feeman, 1980). The SFHR leaves Smyth County and enters Washington County, Virginia, at about 640 meters in elevation (Anon, 1989).

The SFHR and MFHR previously merged 74 km from its source at SFHR km 116.3 (mi 72.3) in Washington County, Virginia, but now the rivers commingle with the headwaters of South Holston Lake. The SFHR enters South Holston Lake at river km 119.2 (mi 73.9). Based on topographic maps (Anon, 1989), the SFHR upstream from South Holston Lake in Virginia has an average gradient of 4.4 m/km.

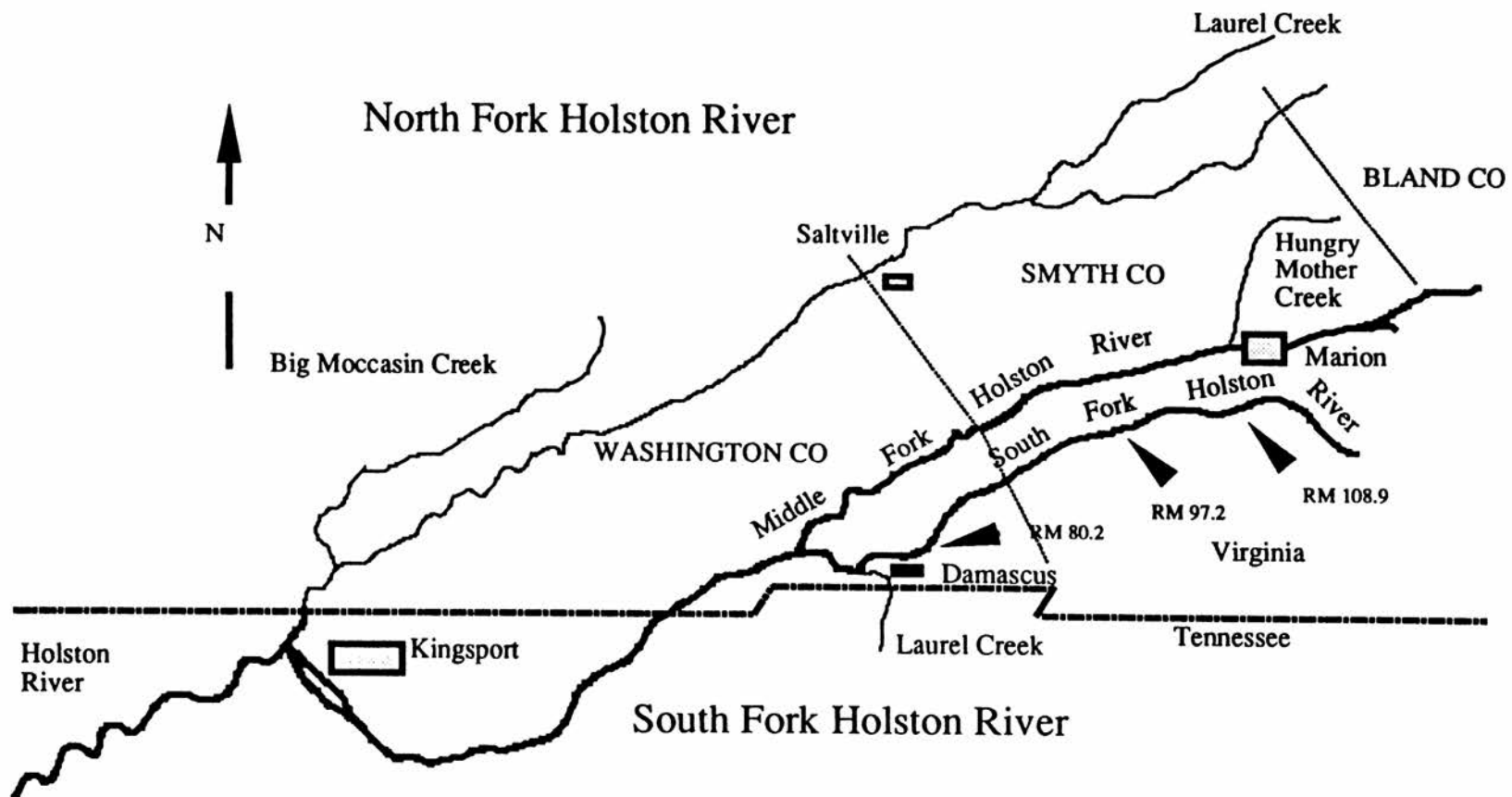


Figure 3. Schematic diagram of North Fork and South Fork Holston Rivers, showing relative locations of the major tributaries to the South Fork Holston River.

On April 28-29, 1988 at SFHR km 121.5 (mi 75.5) near Damascus, Washington County, Virginia, just 2.3 km (1.6 mi) upstream from where the SFHR flows into South Holston Lake, water quality measurements collected by TVA revealed temperature of 9.8 °C, pH of 7.2, and DO of 9.1 mg/l. On September 11, 1973, N.M. Burkhead (in litt.) recorded a water temperature of 18 °C in the SFHR at Damascus.

The major towns and villages along the SFHR in Smyth County are Sugar Grove, Roberts Mill, Holstein Mill, Thomas Bridge, and St. Clair Bottom. The major tributaries entering the SFHR in Smyth County are Cressy, Dickey, Comers, Rowland, and St. Clair creeks. In Washington County the SFHR flows past the towns of Loves Mill, Friendship, Delmar, and Alvarado. The major tributaries to the SFHR in Washington County, Virginia, are Bear Branch, Beech Creek, Henry Widener Creek, Laurel Creek, Louse Creek, Mill Creek, Patterson Branch, Rockhouse Run, and Rush Creek.

On November 20, 1950, South Holston Dam was closed at SFHR km 80.1 (mi 49.8) in Sullivan County, Tennessee. The resultant reservoir, South Holston Lake, is 39.1 km (24.3 mi) long with an average mean elevation of 527 m (1,729 ft) AMSL. The reservoir stores 89,280 hectare-meters of water. The maximum discharge from the dam is 8,300 cfs (Ahlstedt et al., unpublished manuscript, 1979).

The fifteen miles (24.1 km) between South Holston Dam and Boone Lake is considered the South Holston tailwater. The South Holston tailwater was on the average about 45.7 m (150 ft) wide and the stream flow rate averaged 2,800 cfs with a minimum low flow of 50 cfs (Ahlstedt et al., unpublished manuscript, 1979). The average flow at the dam is 894 cfs (Division of Water Quality Control, 1977).

South Holston tailwaters had a mean DO of 5.8 mg/l (1.4 in September and 9.8 in February) with periods of low DO from July through November and a pH of 7.5 (7.2-7.7) (Ahlstedt et al., unpublished manuscript, 1979). Cox (1986) reports that the DO drops to less than 6 mg/l for an average of 19 weeks per year in the South Holston tailwater.

Boone Dam is situated at SFHR km 29.7 (mi 18.6). The ordinary minimum elevation of Boone Lake is 406 m (1,330 ft) AMSL. The Boone tailwater flows directly into Fort Patrick Henry Lake.

Fort Patrick Henry Dam is located on the SFHR at river km 13 (mi 8.2) in Sullivan County, Tennessee. Fort Patrick Henry Lake extends 16.7 km (10.4 mi) upstream to Boone Dam (Colwell and Hill, unpublished manuscript). The dam was closed October 27, 1953. The ordinary minimum elevation of Fort Patrick Henry Lake is 384 m (1,258 ft) AMSL.

The Fort Patrick Henry tailwater is 8.2 miles long and flows through Kingsport, Tennessee, where the average flow is 2,520 cfs (Cox, 1986). As reported earlier, an agreement between Tennessee Eastman and the TVA guarantees a minimum daily flow of 750 cfs into the SFHR from Fort Patrick Henry Dam.

Tennessee Eastman made five measurements of water chemistry at Kingsport, Tennessee, in Sullivan County, on the SFHR just upstream from the NFHR from June 21-25, 1965 with an average temperature of 23.7 °C (22.2-25.3 °C), pH of 7.4 (7.1-7.7), and DO of .54 ppm (0-2.1 ppm) recorded.

The entire main channel of the MFHR flows across Ordovician limestone into South Holston Lake, but as mentioned above the MFHR originally intersected the SFHR in Washington County, Virginia, at SFHR km 116.3 (mi 72.3). The MFHR drains 632 km² and the average flow at Meadowview, Virginia, is 231 cfs (Cox, 1986). Moving downstream, accumulation of silt increases. The substrate is composed of bedrock covered by boulders, rubble, gravel, sand, or silt. Pools and runs exhibit moderate siltation that increases downstream. Feeman (1980) places the source of the MFHR in Smyth County, but the *Virginia Atlas and Gazetteer* (Anon, 1989) places the origin in Wythe County, Virginia, about 2 km southwest of Rural Retreat at an elevation of about 800 m (Figure 3). The MFHR has a gradient of 1.9 m/km and an average flow of

4.6 m³/sec (Feeman, 1980). It drains 631.96 km² (244.09 mi²) of Virginia (Cox, 1986) in either Smyth or Washington counties, except for the small stretch in Wythe County, Virginia. (Anon, 1989). Marion, with a human population of 1,000, is the largest town on the MFHR (Feeman, 1980).

Water quality measurements were taken by the TVA in August-September, 1973 at MFHR mi 4.8 (temperature 21.0 °C, pH 9.2, and DO 7.5 ppm), MFHR mi 35.1 (temperature 19.0 °C, pH 8.0, and DO 9.8 ppm), and MFHR 50.2 (temperature 17.0 °C, pH 9.2, and DO 12.5 ppm), indicating a decrease in temperature and an increase in DO moving upstream in the MFHR.

Historically, the Watauga River flowed 131.9 km (82 mi) to a confluence with the SFHR, but now those two rivers flow into Boone Lake. The Watauga River drains 2,250.71 km² (Cox, 1986). The river begins as a small lake in Linville Gap between Grandfather Mountain and Flattop Mountain at an elevation of about 1200 m in Avery County, North Carolina. About 2 km from its source, the Watauga River enters Watauga County, N.C., where it flows through the towns of Shulls Mill, Valle Crucis, and Beech Creek. Major tributaries to the Watauga River in North Carolina are Cove, Beaverdam, and Beech creeks. The river in North Carolina is typical of a Blue Ridge stream. It has a combination of Precambrian bedrock, boulders, rubble, gravel, and sand.

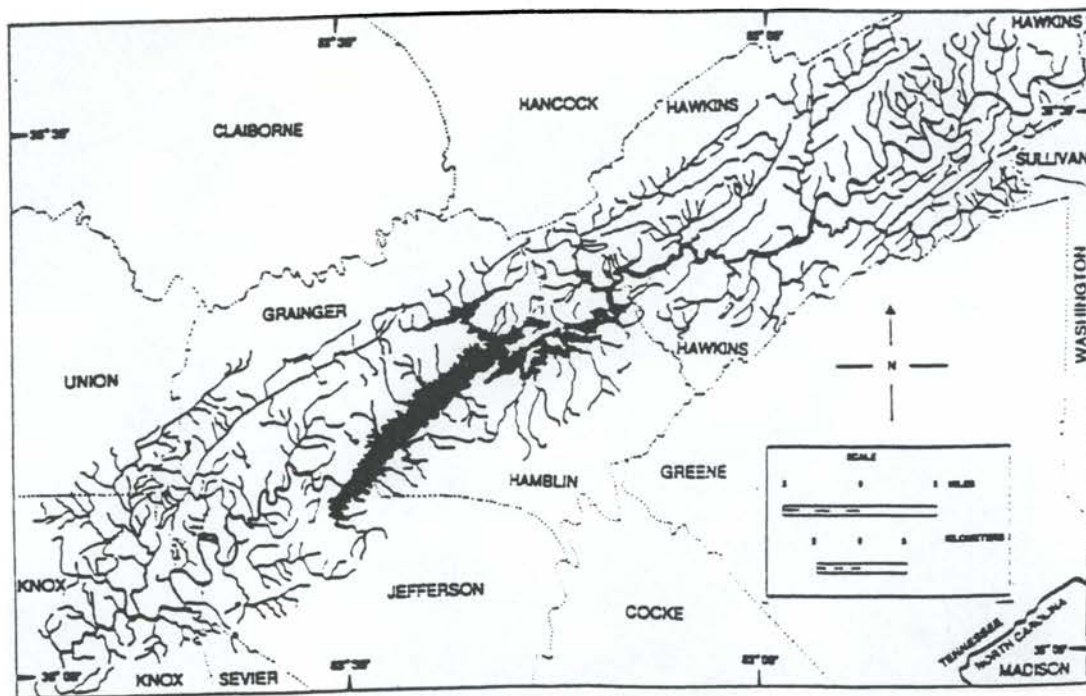
The Watauga River leaves North Carolina after crossing under U.S. Hwy 321 at an elevation of 1000 m (3,280 ft) (Anon, 1992a) and a distance of about 10 air km from an entry into Watauga Lake in Johnson County, Tennessee, at an elevation of 597 m (1,958 ft) (Anon, 1992b). Watauga River enters Tennessee at Watauga River km 87.5 (mi 54.4). An impressive "Watauga Falls" is situated between North Carolina and Watauga Lake. At the North Carolina/Tennessee state line from 1967-1974 the average flow (about 17 cfs), pH (7.0), and the DO (10.9-11.1 ppm) were measured by the TVA (Division of Water Quality Control, 1977). The only free flowing portion of Watauga River in Johnson

County, Tennessee, is just upstream from Watauga reservoir and downstream from the North Carolina border at Watson Island.

Watauga Dam was closed on December 1, 1948, at Watauga River km 59.1 (mile 36.7) in Carter County, Tennessee. Watauga Lake is 26.9 km (16.7 mi) long, impounding the Watauga River to km 85.9 (mi 53.4) in Johnson County, Tennessee. The ordinary mean elevation of the lake is 384 m (1,258 ft) AMSL. The major tributaries to Watauga Lake in Johnson County are Roan Creek and Doe Creek. Watauga Lake tailwaters flow 1.2 km (.75 mi) to Watauga Powerhouse. Between the powerhouse and dam the tailwater is a warm water stretch of the Watauga River.

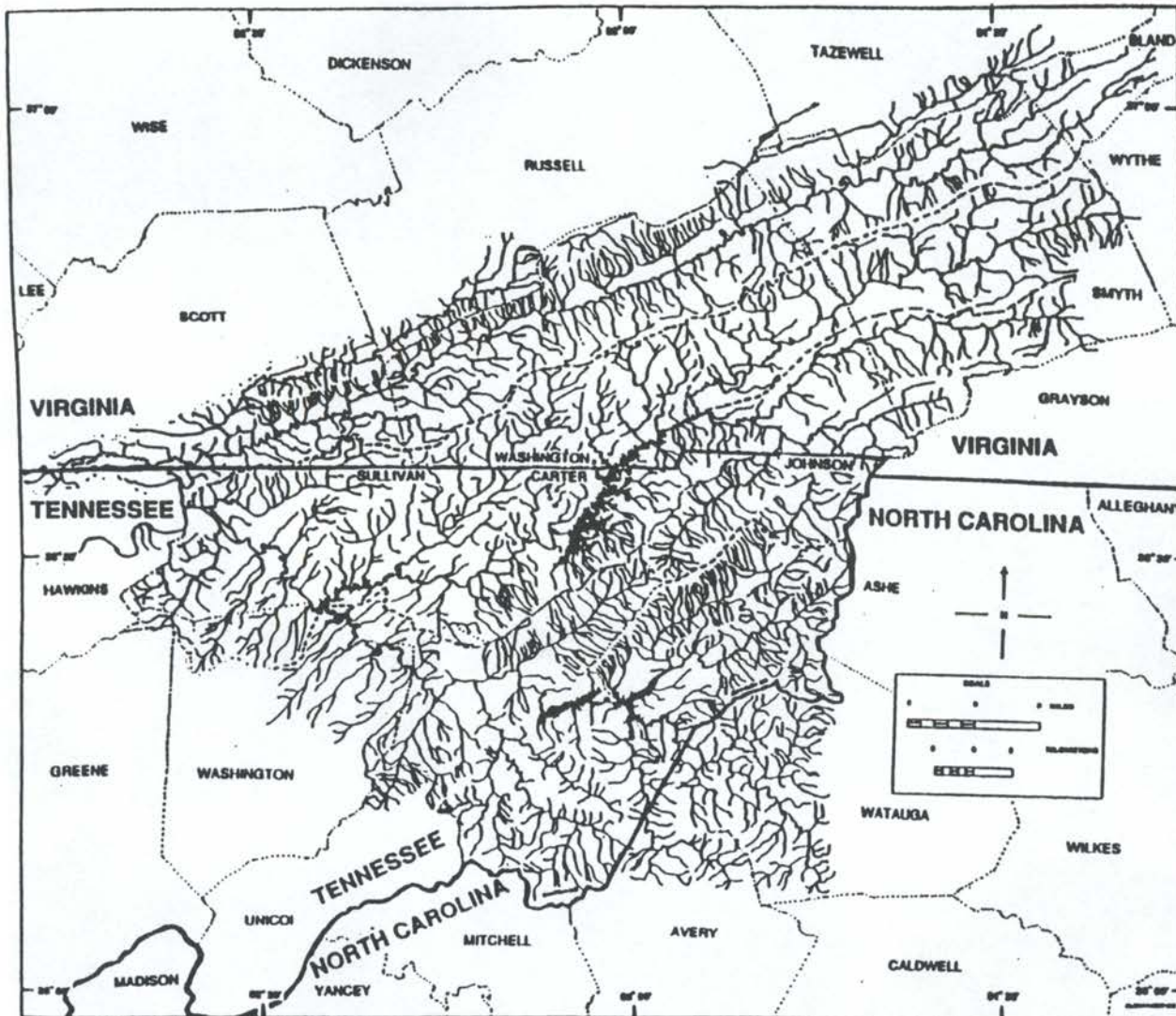
Wilbur Dam was purchased by TVA in 1945, and is located at Watauga River km 54.7 (mi 34.0). The reservoir is 2.9 km (1.8 mi) long. Measurements in the Wilbur tailwater in 1951 revealed that chemical and physical parameters such as temperature (3.3 °C - 10 °C), pH (7.0 - 7.6), DO (12 and 3 ppm), and flow (0 - 3,400 cfs) fluctuated annually (Pfitzer, 1954). At Elizabethton the average flow was 1,095 cfs (Cox, 1986). The Watauga River from river km 26.4 (mi 16.4) to the SFHR is impounded by Boone Dam. The Watauga River flows through the towns of Elizabethton, Sycamore Shoals, and Watauga. The major tributaries entering Watauga River in Carter County are Elk River, Stony Creek, Doe River, and Buffalo Creek.

The drainage patterns of the Holston River proper and the upper tributaries to the Holston River system in North Carolina, Tennessee, and Virginia are presented on pages 18 and 19 (Figure 4). These maps show the relative locations of political boundaries in the vicinity of the Holston River system .



Map of the Holston River proper and its tributaries in Tennessee.

Figure 4. Drainage map of Holston River system.



Map of upper tributaries to the Holston River in North Carolina, Tennessee, and Virginia.

Figure 4. ... (continued).

Natural History of the Holston Basin

According to Nilsson (1983), the glacial theory and a nomenclature of homogeneous geological sequences were developed in the following chronological order. In 1759 and 1760 G. Arduino, a paleontologist, recognized and classified four discrete geological strata, comprised of unique fossiliferous sediments. Arduino suggested names for these four strata, the Primary (= Paleozoic Era), Secondary (= Mesozoic Era), Tertiary, and Quaternary. Later, the Tertiary and Quaternary were recognized as collectively filling the boundaries of the Cenozoic Era. The hypothesis of a global glacial period, *Eiszeit*, or "ice age" was suggested by many European philosophers from Venetz in 1829 to the prominent L. Agassiz in 1840. C. Lyell in 1832 suggested a division of the Tertiary Period into subunits which he called epochs and in 1839 he proposed the concept of a Pleistocene epoch which, *at that time*, was equivalent to the entire Quaternary Period (Nilsson, 1983). Subsequently, Pleistocene became a synonym with the mid-latitude glacial component of the Quaternary, while Recent referred to the remaining postglacial segment of the Quaternary. Later, the word Holocene was suggested as a replacement term for Recent, the postglacial epoch of the Quaternary Period. Nilsson (1983) goes into greater depth on this subject and provides an excellent account of the historical development and conceptualization of the Pleistocene epoch.

At least four major advances and retreats of ice sheets (glaciers) occurred in northern North America during the Pleistocene. Those periods of glacial advance are named Nebraskan, Kansan, Illinoian, and Wisconsinan (Wisconsin). The last great glacial advance has been spelled differently by various authors in different publications. It has been spelled Wisconsin by Underhill (1957), Hubbs and Lagler (1964), and Trautman (1981); both spellings were adopted by individual authors in Martin and Klein (1984); and Wisconsinan was used by consensus of authors in Hocutt and Wiley (1986). Wisconsinan

is used here for the sole purpose of remaining consistent with the usage of the "-an" ending for all four glacial periods.

Some of the earliest fossils of fishes in North America were jawless ostracoderms of the class Agnatha and the order Heterostraci (Pteraspidiiformes). They are known from fossils uncovered in Colorado, Montana, South Dakota, and Wyoming in the western United States from sandstone deposits of middle Ordovician age of the Paleozoic Era (Denison, 1967). Fossil deposition of ostracoderms has been the subject of a taphonomic dispute between various authorities (Denison, 1967; Halstead, 1973). It is not clear whether early ostracoderms lived in freshwater or marine environments. Fossils of the fish were preserved in sediments that may have originated in the deltas of rivers at a freshwater/marine interface. This dispute has centered on whether ostracoderms were freshwater organisms that died in rivers and were washed downstream to river deltas, eventually coming to rest in marine sediments where their fossils are found today, or whether ostracoderms were marine inhabitants that after dying near freshwater were preserved in sediments where only specific physical conditions existed for fossil formation of this group. This would explain the absence of early ostracoderm fossils in other marine fossiliferous deposits of the same age that originated in marine habitats disassociated from any apparent freshwater source (Denison, 1967; Halstead, 1973). Ordovician sediments are common throughout the Holston River valley, represented as limestone and dolomite deposits (Hardeman, 1966). No direct physical evidence suggests that ostracoderms lived in Ordovician seas in the area that is now the Holston River valley. It may be that conditions here were unfavorable for fossil formation (Denison, 1967; Halstead, 1973). Small areas of isolated Silurian and Devonian sandstone deposits occur at the apex of Clinch Mountain, and along the main channel of the NFHR in Virginia. This sandstone could harbor fossil remains of the class Osteichthyes that dominated the Devonian, the "Age of Fishes". If other Devonian sediments were deposited in the Holston valley, they

have apparently eroded away. To date no fossil evidence of fishes from the past has been discovered in sedimentary rocks from the Holston River valley.

From the Mesozoic Era, some holostean families (i.e., Amiidae and Lepisosteidae) dominated the final period, the Cretaceous, 135-65 million years ago (MYA) (Cavender, 1986). Some fish families known from the Holston River system such as Acipenseridae, Lepisosteidae, and Polyodontidae have fossil records from the Cretaceous in western North America; others (Catostomidae, Clupeidae, Esocidae, Hiodontidae, Ictaluridae, Percichthyidae) first appear in Cenozoic fossil beds of western North America, but probably originated in the Mesozoic (Cavender, 1986). In any case, no Mesozoic fossil deposits have been located in the Holston River valley, but these nine families of Osteichthyes that are present in the Holston River today probably were present in North America during the Cretaceous.

The Cenozoic Era began 65 MYA and is still in progress. The Cenozoic is divided into the Tertiary and Quaternary periods. The Tertiary witnessed the dominance of mammalian over reptilian faunas, and the successes of angiosperms among the floral communities. The early Tertiary (Paleogene) enjoyed a subtropical to temperate climate, but the late Tertiary (Neogene) began to experience a colder climate from the Miocene through the Pliocene. In Europe, a Pliocene flora developed that suggested domination by a mixed mesophytic forest. Cavender (1986) reported that three families of freshwater fishes presently inhabiting the Holston River system were represented by fossils in North America from Paleogene sediments. Those fish families include the Centrarchidae and Salmonidae from the Eocene (53-38 MYA); and the Cyprinidae from the Oligocene (38-25 MYA). Neogene sediments from the Pliocene (5-1.8 MYA) produce the two remaining fish families known to occur in the Holston River, the Percidae and Atherinidae (Cavender, 1986).

The Quaternary Epoch replaced the Tertiary Epoch as the global climate cooled, an event occurring somewhere between 3.8 and 1.0 MYA (Martin and Klein, 1984; Hocutt and Wiley, 1986). A glacial theory, developed in the 19th century, suggested the existence of a time period somewhere in the past when massive ice sheets covered various continental land masses that are ice free in modern times; that time period is now called the Pleistocene. During the Pleistocene, glacial ice sheets repeatedly formed in the Arctic, moving south only to retreat again. Four punctuated periods of glacial advances towards the south were accompanied by periods of cooling in North America. The last Pleistocene glacial advance in North America was the Wisconsinan. Freshwater was stored in continental ice sheets and the ocean level was 100 m lower than at present (Delcourt and Delcourt, 1981). Ice covered vast areas of the northern regions while in the southeastern United States there were predominately ice free regions. These areas, although ice free, were characterized by colder climates compared with modern ambiance but allowed for a uniform annual temperature regime with a marked decrease in seasonality (Guthrie, 1984). Apparently, the Wisconsinan glaciation persisted in the eastern United States until it peaked about 16,500 years BP (Delcourt, 1979; Delcourt and Delcourt, 1984). Changes in the biota during and since the Pleistocene are apparent from animal bone and plant pollen that have left a record that can be dated by Carbon 14 methodology. A "boreal" flora and fauna, adapted to the colder environment, was established in the southeastern United States during the Pleistocene. A review of studies by various authorities of the Pleistocene floral and faunal associations was completed by Guthrie (1984) and he summarizes that unique heterogeneous biomes existed on various continents (Europe and North America) and within various states of the United States (i.e., Alaska, California, Florida, Nevada, Pennsylvania, Tennessee, and Wyoming) that have no modern counterparts. So although "boreal" seems intuitively obvious as the proper descriptive term for vegetational type of the southeastern United States during the Pleistocene, "taiga" might be a better visual aid,

although neither term is correct. Not only were the associations of plants unique during the Pleistocene, but species of terrestrial animals that are allopatric today appear to have been sympatric during the Pleistocene (Guilday et al., 1978; Guthrie, 1984). Specifics of these associations are given in the following paragraphs. The diversity and abundance of large mammals (over 5 kg) in North America that had begun to increase in the Miocene (Webb, 1984) were on the decline throughout the Pleistocene (Grayson, 1984). The Wisconsinan glaciation and the Pleistocene Period ended about 10,000 to 12,000 years BP (Martin and Klein, 1984). Regardless of the cause, at the end of the Wisconsinan glacial period many of the remaining large mammalian megafauna that characterized the Pleistocene became extinct and many species of smaller mammals experienced new distributional patterns and associations (Guthrie, 1984). Species shifted in degrees of importance as assemblages responded to climatic changes, especially increased seasonality (Guthrie, 1984).

Eventually, the ice sheets retreated and the Pleistocene either ended or an interglacial period began 10,000 or 12,000 years BP. The conclusion that the Pleistocene ended 10,000-12,000 years BP is based on the timing of correlated mass extinctions of terrestrial megafauna associated with climatic changes on a global scale (Agenbroad, 1984; Gilbert and Martin, 1984; Webb, 1984). Mass extinctions have been used as sufficient reference points to delineate the end of different time periods, notably the Permian and Cretaceous.

Water in streams and rivers was probably reduced in volume and became colder during the Wisconsinan glacial period. The effect of climatic changes that occurred in the Pleistocene on the distribution of modern fishes in North America has been noted by Cooper (1935), Underhill (1957), Jenkins et al. (1971), Trautman (1981), Hocutt and Wiley (1986), and Etnier and Starnes (1993). Osteological elements recovered from archaeological and paleontological sites in Tennessee in general (Dickinson, 1986) and the Holston River valley in particular (Guilday et al., 1978; Manzano, 1986) indicate a Pleistocene origin. A complex distribution of fish taxa in the upper Tennessee River

drainage has resulted since the Pleistocene ended (Cope, 1868c; Jordan, 1889b; Ross and Carico, 1963; Jenkins et al., 1971; Etnier and Starnes, 1991; Eisenhour, 1993; Etnier and Starnes, 1993; Jenkins and Burkhead, 1994). Gradually a warming trend in rivers and streams began as the Wisconsinan glaciers retreated.

The Holocene as conceived here represents the postglacial element of the Cenozoic Epoch, including the present. The Holocene began as northern ice sheets melted and the global climate warmed. The climate of the southeastern United States became increasingly temperate and colonized by modern deciduous forest; those forests have remained relatively stable for 9,000 years (Delcourt, 1979). Holocene boreal assemblages appeared to the north and remained in their present locations (Barclay, 1957; Delcourt, 1979; Delcourt and Delcourt, 1984). Water temperatures of rivers throughout the southeastern United States began to rise. Precipitation increased during this warming period and rivers flooded, raising the ocean level. The stability of the post-Pleistocene habitat is indicated by Bogan (1986), who suggests that assemblages of freshwater mussels (Pelecypoda: Unionidae) have remained stable in the upper Tennessee River for the last 6,000 years.

Presumably some fish species that were adapted to warmer conditions were forced to move toward southern latitudes during glacial advances of the Pleistocene and other species of fishes remained and adapted to the colder conditions. During the Holocene, warmwater fish species that had retreated during the Pleistocene were able to successfully re-colonize the warming waters of the upper Tennessee River. Fish species that adapted to colder water temperatures in the upper Tennessee River during the Pleistocene could not move downstream through thermal barriers as waters warmed at lower elevations. They were trapped in the only remaining survivable habitat to which they had access. These fishes were forced to retreat into higher elevations where conditions of water volume and temperature better simulated conditions that had prevailed in the Pleistocene. Some species were forced into montane isolation and became glacial relicts in the colder headwater

streams of higher elevations while larger, warmer upland rivers had a mixing of both northern and southern forms (Jenkins et al., 1971; Starnes and Etnier, 1986; Eisenhour, 1993). In the upper Tennessee River, *natural* habitat alteration may have resulted in a disruptive evolutionary event as evidenced by many related species of fishes that have a high elevation species or montane form restricted to the Blue Ridge physiographic province and a low elevation, presumably derived sibling taxon (subspecies or species), inhabiting the upland Ridge and Valley physiographic province (Jenkins et al., 1971; Etnier and Starnes, 1993). Whatever the origin of these closely related forms it seems likely that they are most easily identified or defined by their strict allegiance to a particular habitat. Their preferred habitat appears to be correlated with physiographic province. For example, when the Blue Ridge physiographic province is compared to the Ridge and Valley physiographic province, differences in water volume and temperature become apparent. These physical parameters mimic the differential habitats that nurtured northern and southern taxa during the Pleistocene.

Records of fishes in the Holston River valley begin with elements attributable to the Pleistocene (Guilday et al., 1978; Manzano, 1986). A good picture of the Pleistocene and Holocene fauna and flora in and around the Holston River system can be drawn from papers dealing specifically with the Pleistocene of East and Middle Tennessee. Investigators have speculated on the floral and faunal composition of the Pleistocene in the Holston River valley (Barclay, 1957; Ray et al., 1967; Guilday et al., 1975, 1978; McDonald, 1984a, 1984b, 1985a, 1985b; Manzano, 1986) as well as on the Highland Rim of Middle Tennessee (Delcourt, 1979). Barclay (1957) speculated on the composition of Pleistocene flora in the Holston River valley based on pollen identification within Shady Valley near Mountain City (36°28' N; 81°49' W) at an elevation of 800 meters. Ray et al. (1967) reported on a wide variety of Pleistocene mammals and a sample of associated pollen collected from Saltville at the Smyth and Washington county lines (36°52' N) at an

elevation of 524.6 m . Guilday et al. (1975) reported on Pleistocene fauna in the Holston River valley from three caves on the banks of the SFHR in Sullivan County of East Tennessee, Guy Wilson Cave (36° 27'N, 82°13'W), Baker Bluff Cave (36°27'30"N, 82°28'W), and Beartown Cave (36° 34' 15"N, 82°36'20"). Guilday et al. (1978) reported on late Pleistocene remains from a cave formed in limestone, Baker Bluff Cave, 5 km downstream from the junction of the SFHR and the Watauga River (36°27'30"N, 82°28'W) at an elevation of 450 meters. Delcourt (1979) searched for a site that could give a continuous record of pollen from 20,000 years BP to the present. She found that site in Anderson Pond, formed by the collapse of dolomite in a karst region on the Highland Rim in White County, Tennessee, 0.8 km west of the Cumberland Plateau (36°02' N, 85°30'W) at 150 meters elevation. McDonald (1984b, 1985a, 1985b) and McDonald and Bartlett (1983) reported on an extinct river and 15,000 years of continuous sedimentation in a lake in the vicinity of Saltville, the same locality as reported by Ray et al., (1967).

Ray et al. (1967) reported an age of $13,640 \pm 420$ years BP for sediments trapped in one mammalian skull collected from Saltville, Virginia, and identified the undated remains of nine megafaunal mammals to at least genus, including giant ground sloth (*Megalonyx*), horse (*Equus*), extinct moose (*Cervalces*), caribou (*Rangifer tarandus*), bison (*Bison*), extinct muskox (*Bootherium*), extinct woodland muskox (*Symbos cavifrons*), American mastodon (*Mammut americanum*), and woolly mammoth (*Mammuthus primigenius*). These were collected in the vicinity of the Olin Mathieson Chemical Corporation property at a salt spring along the NFHR. Pollen samples within one mammalian skull, although not dated, were dominated by pine (*Pinus*) and spruce (*Picea*) with traces of oak (*Quercus*) and birch (*Betula*) (Ray et al., 1967), indicating a mixed coniferous/deciduous forest that was typical of the Pleistocene in North America from the Pacific to Atlantic coast and south of the glaciers (Guthrie, 1984). This allows a general impression of the flora and fauna during the Pleistocene in the Holston River

valley, but other workers were able to establish dates for their discoveries. A synopsis of those discoveries is given in chronological order below, beginning with the oldest finds.

American mastodon and woolly mammoth bones were recovered beneath 15 meters of topsoil north of the NFHR near Abingdon and dated at 45,000 BP by a state geologist of the Commonwealth of Virginia, according to the property owner. These fossils were shown to the author and P.W. Parmalee, zooarchaeologist at the University of Tennessee.

According to Delcourt (1979), $25,000 \pm 3,000$ years BP, pine (*Diploxylon*) dominated arboreal taxa on the Highland Rim of Tennessee with spruce and balsam fir (*Abies*). An admixture of deciduous trees comprised 23% of the pollen sample, including oak, ash (*Fraxinus*), ironwood (*Ostrya-Carpinus* type), hickory (*Carya*), birch, butternut (*Juglans cinerea*), Virginia willow (*Itea*), elm (*Ulmus*), hackberry (*Celtis*), black gum (*Nyssa sylvatica*), viburnum (*Viburnum*), and red maple (*Acer rubrum*).

During the Wisconsin Full-Glacial from 19,000 to 16,500 years BP a stable boreal forest was dominated by jack pine (*Pinus banksiana*) and spruce at Anderson Pond on the Highland Rim of Tennessee (Delcourt, 1979), and the Saltville Valley on the NFHR had a local vegetation of sedge and meadows with alder swamps (McDonald, 1985a), while the higher knolls around Saltville Valley were dominated by pine (*Diploxylon*) and spruce (Ray et al., 1967). Fish, including freshwater drum (*Aplodinotus grunniens*) and madtoms (*Noturus*), were reported from Baker Bluff Cave on the SFHR dated $19,000 \pm 850$ years BP (Guilday et al., 1978). Species in the mammalian family Sciuridae, including the eastern chipmunk (*Tamias striatus*), woodchuck (*Marmota monax*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), gray squirrel (*Sciurus carolinensis*), red squirrel (*Tamiasciurus hudsonicus*), southern flying squirrel (*Glaucomys volans*), and northern flying squirrel (*Glaucomys sabrinus*), were identified from a level dated as $19,000 \pm 850$ years BP from the Baker Bluff Cave on the SFHR (Guilday et al., 1978). Carnivores taken from the $19,000 \pm 850$ years BP level of Baker Bluff Cave included the

red fox (*Vulpes vulpes*), black bear (*Ursus americanus*), raccoon (*Procyon lotor*), pine marten (*Martes americana*), long-tailed weasel (*Mustela frenata*), eastern spotted skunk (*Spilogale putorius*), and jaguar (*Felis onca*) (Guilday et al., 1978). Artiodactyla from the same excavation included flat-headed peccary (*Platygonus compressus*), white-tailed deer (*Odocoileus virginianus*), and caribou (Guilday et al., 1978). Guilday et al. (1975) reported the following taxa identified from bones recovered from Guy Wilson Cave, Sullivan County, Tennessee, along the SFHR and associated with a dated peccary bone (19,700 ± 600 years BP): dire wolf (*Canis dirus*), woolly mammoth, giant ground sloth, tapir (*Tapirus*), and porcupine (*Erethizon*).

From 16,500 to 12,500 years BP, a minor warming trend occurred causing jack pine to diminish in importance along the highland rim while spruce, fir, oak, ash, ironwood, hickory, birch, and elm persisted. Beech and sugar maple appeared around 13,000 years BP and emergent aquatic plants increased in abundance between 12,750 and 12,500 years BP (Delcourt, 1979). Around 15,000 BP, the Laurentide ice sheet was retreating, coinciding with a warming period in eastern North America (Delcourt, 1979; Delcourt and Delcourt, 1981; King and Saunders, 1984). Based on deposits studied, McDonald (1985a) suggested that an extinct "Saltville River" turned into a lake between 14,000 and 13,000 BP, and the presence of the halophyte *Zannichellia pallustris* in those deposits indicates that this may have been a salt lake. The mixed coniferous/deciduous forest was replaced by deciduous forest on the Highland Rim by 12,500 years BP (Delcourt, 1979). There was a rapid change in flora from 12,500 BP to 10,000 BP at the end of the Wisconsin glacial period. From 12,500 years BP at Anderson Pond on the Highland Rim a mixed mesophytic forest of oaks, ash, ironwood, hickory, birch, walnut, elm, beech, sugar maple, basswood, and hemlock (*Tsuga*) expanded rapidly (Delcourt, 1979). McDonald (1985a) reported that between 11,000-10,000 BP the Saltville Valley had an increase in dry land and the surrounding arboreal vegetation converted to a mixed

coniferous/deciduous forest, but by 10,000 BP the marsh-like conditions in the valley had returned.

Fish remains are available from late Pleistocene/ and early Holocene sites. Osteological elements were excavated inside Baker Bluff Cave near the SFHR from various levels and the following fish taxa were identified, *Moxostoma* (redhorse suckers), *Ambloplites rupestris* (rockbass), *Stizostedion* (sauger/walleye), and *Aplodinotus grunniens* (freshwater drum). The level dated was most likely at least as old as another level above it that was dated at $11,640 \pm 250$ years BP (Guilday et al., 1978). Cyprinidae and *Aplodinotus grunniens* were identified from the level dated at $11,640 \pm 250$ years BP while Cyprinidae, *Catostomus commersoni* (white sucker), *Moxostoma carinatum* (river redhorse), *Ictalurus punctatus* (channel catfish), *Stizostedion*, and *Aplodinotus grunniens* were all identified from a level dated $10,560 \pm 228$ years BP (Guilday et al., 1978).

Barclay (1957) identified pollen from a bog at Shady Valley, Johnson County, Tennessee, dated $9,500 \pm 150$ years BP. Pollen samples suggested that pines were less abundant than in the preceding period, while spruce, balsam fir, oak, hickory, sweet gum (*Liquidambar*), elm, walnut (*Juglans*), black gum, hemlock (*Tsuga*), beech (*Fagus*), and linden/basswood (*Tilia*) increased in abundance. Barclay (1957) considered 9,500 BP to be "a moist hemlock time" in Shady Valley .

Delcourt (1979) stated that the Middle Tennessee Holocene vegetation has been relatively stable for the past 9,000 years. Delcourt (1979) reported an increase in oak, ash, hickory, birch, alder, button bush, and Virginia willow on the highland rim based on an analysis of pollen that was dated between 8,000 and 5,000 years BP, and from that evidence she infers a warming and drying trend for the period.

From the SFHR in levels dated between 10,000 BP and 2,900 BP from the Eastman Rockshelter near Long Island at Kingsport, Tennessee, Manzano (1986) identified two fish taxa, *Moxostoma* (redhorse suckers) and *Aplodinotus grunniens* (freshwater

drum). From a level dated between 2,900-1,800 BP, Manzano (1986) reported the identification of those two taxa plus eight additional fish taxa from the SFHR including the gar, *Lepisosteus*; harelip sucker, *Lagochila lacera* (= *Moxostoma lacerum*); catfish, *Ictalurus*; flathead catfish, *Pylodictis olivaris*; black bass, *Micropterus*; rockbass, *Ambloplites rupestris*; crappie, cf. *Pomoxis*; and sauger/walleye, *Stizostedion*. Osteological elements dated between 1,800 -1,400 BP added three taxa — *Ictiobus* (buffalo), *Carpiodes* (carpsucker), and *Hypentelium nigricans* (hogsucker) to the list of fishes collected. In all, Manzano identified 13 taxa inhabiting the SFHR prior to 1,400 BP.

In addition to mammals known to frequent the area around the SFHR today, Manzano (1986) identified the remains of porcupine (*Erethizon dorsatum*), river otter (*Lutra canadensis*), cougar (*Felis concolor*), and elk (*Cervus elaphas*) from a level dated between 2,900-1,800 BP from the Eastman Rockshelter on the SFHR.

Several fishes were identified from a level in Baker Bluff Cave on the SFHR just downstream of Watauga River dated at 555 ± 185 years BP. These included *Hypentelium nigricans* (hogsucker), *Catostomus commersoni* (white sucker), *Moxostoma* cf. *duquesnei* (redhorse sucker), *Moxostoma erythrurum* (golden redhorse), *Ictalurus punctatus* (channel catfish), *Esox* (? muskellunge), *Micropterus dolomieu* (smallmouth bass), *Lepisosteus* (gar), and *Stizostedion* (sauger/walleye) (Guilday et al., 1978). Elk was taken from Baker Bluff Cave on the SFHR from a level dated 555 ± 185 years BP (Guilday et al., 1978).

Mixed mesophytic closed canopy woodlands of oak and chestnut (*Castanea*), river meadows, and sometimes extensive clearings by Indians in the river valleys predominated at the time of European entry into the Holston River valley (Guilday et al., 1978). Early settlers at Saltville, Virginia noted a lake about 120 hectares, but that was drained in the 1840s (McDonald, 1985a).

Ichthyology of the Holston River

1867-1889

The earliest collections of fishes from the Holston River were reported by E.D. Cope (1867, 1868a, 1868b, 1868c). Cope collected fishes in the headwaters of the Holston River system (the NFHR and MFHR) in the "ninth month" (September), 1867, near Saltville, Smyth County, Virginia. Based on information given by Menhinick et al. (1974), Cope was only 25 years old at the time. Cope (1868c) recognized 35 nominal species from the Holston River system which today represent 35 equivalent species (see Table 1). Of those species, two were erroneous reports. Cope (1867, 1868a, 1868b, 1868c) designated 11 of 17 cyprinids collected as new species. Eight are recognized as valid species today (Robins et al., 1991) and one (= *Notropis rubellus micropteryx*) is a valid subspecies (Smith-Vaniz, 1968). Cope (1868c) intended to report just six darters from the Holston and four of those were treated by him as new species. Three of those remain valid today (Robins et al., 1991). Cope (1868c) is credited with reporting 32 species of fishes from the Holston River. He deposited most of his specimens at ANSP.

Next, Colonel M.C. McDonald, U.S. Commissioner of Fish and Fisheries, made a single collection of fishes in the MFHR in Washington County, Virginia, on August 11, 1885. That collection is housed at the USNM under accession number 16400 (R.E. Jenkins in litt., 1993). McDonald reported 14 species from the MFHR (Table 1). All but one, *Etheostoma rufilineatum*, were previously collected by Cope. This brings the cumulative total of species known from the Holston in 1885 to 33.

Jordan and Brayton (1878) summarized the distribution of fishes in the Allegheny region of Georgia, South Carolina, and Tennessee. Holston River records included in Jordan and Brayton (1878) were taken exclusively from Cope's 1867 collections. In 1888, M.C. McDonald directed D.S. Jordan to the Allegheny region of Virginia (Table 1), North

Table 1. List of fish species collected prior to 1900 in the Holston River system. Nominal species collected by Cope in 1867 (Cope; 1867, 1868 a,b,c), McDonald in 1885, and Jordan in 1888 (Jordan; 1889 a,b) Taxa are presented as reported in the left column, and equivalent perceived taxa are represented in the right column. D.A. Etnier (pers. comm.) and R.E. Jenkins (in litt.) suggested the appropriate equivalents.

Cope in 1867 (1867, 1868 a,b,c): 35 nominal species, 34 valid equivalent species, 2 species * erroneously reported from the Holston River. Holston River system accumulative total: 32 species.

<i>Lepisosteus huronensis</i>	<i>Lepisosteus osseus</i>
<i>Campostoma anomalum</i>	<i>Campostoma anomalum</i>
<i>Hypsilepis galacturus</i>	<i>Cyprinella galactura</i>
<i>Ceraticthys monachus</i>	<i>Cyprinella monacha</i>
<i>Ceraticthys hyalinus</i>	<i>Hybopsis amblops</i>
<i>Hypsilepis cornutus</i> ;	<i>Luxilus chrysocephalus</i>
<i>Hybopsis lacertosus</i>	<i>Luxilus chrysocephalus</i>
<i>Hypsilepis coccogenis</i>	<i>Luxilus coccogenis</i>
<i>Ceraticthys biguttatus</i>	<i>Nocomis micropogon</i>
<i>Photogenis leuciodus</i>	<i>Notropis leuciodus</i>
<i>Alburnellus micropteryx</i>	<i>Notropis rubellus</i>
<i>Hybopsis rubricroceus</i>	<i>Notropis rubricroceus</i>
<i>Hybopsis spectrunculus</i>	<i>Notropis spectrunculus</i>
<i>Photogenis telescopus</i>	<i>Notropis telescopus</i>
<i>Phenacobius uranops</i>	<i>Phenacobius uranops</i>
<i>Chrosomus erythrogaster</i>	<i>Phoxinus tennesseensis</i>
<i>Argyreus lunatus</i>	<i>Rhinichthys atratulus</i>
<i>Semotilus corporalis</i>	<i>Semotilus atromaculatus</i>
<i>Catostomus communis</i>	<i>Catostomus commersoni</i>
<i>Catostomus nigricans</i>	<i>Hypentelium nigricans</i>
<i>Teretulus duquesnei</i>	<i>Moxostoma duquesnei</i>
<i>Salmo fontinalis</i>	<i>Salvelinus fontinalis</i>
<i>Fundulus catenatus</i>	<i>Fundulus catenatus</i>
<i>Ambloplites cavifrons</i> *	<i>Ambloplites cavifrons</i> *

Table 1. (Continued) ...

<i>Ambloplites rupestris</i>	<i>Ambloplites rupestris</i>
<i>Lepomis inscriptus</i>	<i>Lepomis megalotis</i>
<i>Micropterus fasciatus</i>	<i>Micropterus dolomieu</i>
<i>Hyostoma blennioperca</i>	<i>Etheostoma blenniodes</i>
<i>Poeciliichthys flabellatus</i>	<i>Etheostoma flabellare</i>
<i>Boleosoma olmstedii</i> *	<i>Etheostoma olmstedii</i> *
<i>Hyostoma simoterum</i>	<i>Etheostoma simoterum</i>
<i>Poeciliichthys zonalis</i>	<i>Etheostoma zonale</i>
<i>Cottogaster aurantiacus</i>	<i>Percina aurantiaca</i>
<i>Percina caprodes</i>	<i>Percina burtoni</i>
<i>Uranidea carolinae</i>	<i>Cottus carolinae</i>

McDonald in 1885 (unpublished): 14 nominal species, 14 equivalent species, 1 valid addition. Holston River system accumulative total: 33 species.

+ = Additions to the Holston cumulative list.

<i>Campostoma anomalum</i>	<i>Campostoma anomalum</i>
<i>Notropis galacturus</i>	<i>Cyprinella galactura</i>
<i>Hybopsis amblops</i>	<i>Hybopsis amblops</i>
<i>Notropis megalops</i>	<i>Luxilus chrysocephalus</i>
<i>Notropis spectrunculus</i>	<i>Notropis spectrunculus</i>
<i>Notropis telescopus</i>	<i>Notropis telescopus</i>
<i>Notropis rubricroceus</i>	<i>Notropis rubricroceus</i>
<i>Rhinichthys atronasmus</i>	<i>Rhinichthys atratulus</i>
<i>Catostomus teres</i>	<i>Catostomus commersoni</i>
<i>Catostomus nigricans</i>	<i>Hypentelium nigricans</i>
<i>Ambloplites rupestris</i>	<i>Ambloplites rupestris</i>
<i>Etheostoma flabellare</i>	<i>Etheostoma flabellare</i>
<i>Etheostoma rufilineatum</i>	<i>Etheostoma rufilineatum</i> +
<i>Etheostoma simoterum</i>	<i>Etheostoma simoterum</i>

Table 1. (Continued) ...

Jordan in 1888 (1889 a): 3 nominal species, 3 equivalent species, 2 valid additions.

Holston River system accumulative total: 35 species.

+ = additions to the accumulative total.

<i>Hybopsis watauga</i>	<i>Erimystax dissimilis</i> +
<i>Etheostoma verecundum</i>	<i>Etheostoma simoterum</i>
<i>Etheostoma swannanoa</i>	<i>Etheostoma swannanoa</i> +

Jordan in 1888 (1889 b): 43 nominal species, 45 equivalent species, 15 valid additions.

Holston River system accumulative total: 50 species.

+ = additions to the accumulative total.

<i>Campostoma anomalum</i>	<i>Campostoma anomalum</i>
<i>Notropis galacturus</i>	<i>Cyprinella galactura</i>
<i>Hybopsis monachus</i>	<i>Cyprinella monacha</i>
<i>Hybopsis watauga</i>	<i>Erimystax dissimilis</i>
<i>Hybopsis amblops</i>	<i>Hybopsis amblops</i>
<i>Notropis lacertosus</i>	<i>Luxilus chrysocephalus</i>
<i>Notropis megalops</i>	<i>Luxilus chrysocephalus</i>
<i>Notropis coccogenis</i>	<i>Luxilus coccogenis</i>
<i>Phenacobius uranops</i>	<i>Phenacobius uranops</i>
<i>Hybopsis kentuckiensis</i>	<i>Nocomis micropogon</i>
<i>Rhinichthys obtusus</i>	<i>Rhinichthys atratulus</i>
<i>Rhinichthys cataractae</i>	<i>Rhinichthys cataractae</i> +
<i>Notropis ariommus</i>	<i>Notropis ariommus</i> +
<i>Notropis leuciodus</i>	<i>Notropis leuciodus</i>
<i>Notropis atherinoides</i>	<i>Notropis photogenis</i> +
<i>Notropis rubricroceus</i>	<i>Notropis rubricroceus</i>
<i>Notropis spectrunculus</i>	<i>Notropis spectrunculus</i>
<i>Notropis spectrunculus</i>	<i>Notropis cf. spectrunculus</i> +
<i>Notropis telescopus</i>	<i>Notropis telescopus</i>

Table 1. (Continued) ...

<i>Notropis microstomus</i>	<i>Notropis volucellus</i> +
<i>Catostomus teres</i>	<i>Catostomus commersoni</i>
<i>Catostomus nigricans</i>	<i>Hypentelium nigricans</i>
<i>Moxostoma duquesnei</i>	<i>Moxostoma duquesnei</i>
<i>Moxostoma duquesnei</i>	<i>Moxostoma erythrurum</i> +
<i>Lagochila lacer</i>	<i>Moxostoma lacerum</i> +
<i>Noturus miurus</i>	<i>Noturus flavipinnis</i> +
<i>Leptops olivaris</i>	<i>Pylodictus olivaris</i> +
<i>Salmo irideus</i>	<i>Oncorhynchus mykiss</i> +
<i>Salvelinus fontinalis</i>	<i>Salvelinus fontinalis</i>
<i>Fundulus catenatus</i>	<i>Fundulus catenatus</i>
<i>Ambloplites rupestris</i>	<i>Ambloplites rupestris</i>
<i>Lepomis pallidus</i>	<i>Lepomis macrochirus</i> +
<i>Lepomis megalotis</i>	<i>Lepomis megalotis</i>
<i>Micropterus dolomieu</i>	<i>Micropterus dolomieu</i>
<i>Etheostoma blennioides</i>	<i>Etheostoma blennioides</i>
<i>Etheostoma flabellare</i>	<i>Etheostoma flabellare</i>
<i>Etheostoma rufolineatum</i>	<i>Etheostoma rufolineatum</i>
<i>Etheostoma simoterum</i>	<i>Etheostoma simoterum</i>
<i>Etheostoma verecundum</i>	<i>Etheostoma simoterum</i>
<i>Etheostoma swannanoa</i>	<i>Etheostoma swannanoa</i>
<i>Etheostoma zonale</i>	<i>Etheostoma zonale</i>
<i>Etheostoma caprodes</i>	<i>Percina burtoni</i>
<i>Etheostoma caprodes</i>	<i>Percina caprodes</i> +
<i>Etheostoma macrocephalum</i>	<i>Percina macrocephala</i> +
<i>Etheostoma squamata</i>	<i>Percina squamata</i> +
<i>Cottus bairdi</i>	<i>Cottus baileyi</i> +
<i>Cottus bairdi</i>	<i>Cottus carolinae</i>

Holston River accumulative total at the end of the eighteenth century:
50 species.

Carolina, and Tennessee, (Jordan, 1889a,b). Jordan (1889b) was assisted in 1888 by former students O.P. Jenkins and B.W. Evermann collecting fishes in the SFHR at Holstein Mills (August 7), the MFHR at Marion (August 7), the MFHR near Glade Spring (August 8), and in the NFHR at Saltville (August 9). They collected the following stream localities in Tennessee: Beaver Creek near Bristol (August 10), Watauga River from Elizabethton to Watauga Point (August 11), and the Doe River at Elizabethton (August 11). In advance of the general report owed to the U.S. Fish Commission, M.C. McDonald gave Jordan permission to describe 14 new species of fishes that Jordan collected in the summer of 1888, including three new species from the Holston River (Table 1) (Jordan, 1889a). Only one of those three species, *Etheostoma swannanoa*, is considered a valid species today, but Jordan made two valid additions to the known species in the Holston River system. Jordan (1889b) reported on the complete results of the collections made in the Holston River in 1888, listing 43 nominal species (45 equivalent species valid today) and making 15 valid additions to the Holston River ichthyofauna (Table 1). In 1888, the Holston cumulative fish list reached 50 species. Jordan was the last to collect *Moxostoma lacerum* and *Noturus flavipinnis* from the Holston River system. Jordan deposited the bulk of his collections at the USNM.

1900-1949

The Holston River system was neglected by ichthyologists during the 40 years 1888 to 1928. On July 9, 1928, H.R. Becker and party collected fishes from Beaver Creek (a tributary to the NFHR) and the NFHR "above" Saltville. Becker sent his specimens, representing 31 species, to C.L. Hubbs at the University of Michigan Museum of Zoology (UMMZ), where they were catalogued. Becker wrote a letter to Hubbs expressing some doubt as to the accuracy of the locality data (Jenkins, in litt., 1993). Although Hubbs was aware of Becker's uncertainty, he catalogued the specimens into UMMZ allowing the data to stand. This gives some strength to the records, because

Hubbs was careful about locality information. Even so, it is best to be cautious concerning two records by Becker in 1928 from the NFHR, *Etheostoma spectabile* (7 specimens) and *Percina maculata* (3 specimens). These would be major range extensions for either species. (Note: These two species were originally identified by Hubbs, and subsequently examined by R.E. Jenkins, who concurred with Hubbs as to their identity.) Therefore, setting aside those species, Becker added to the Holston list an additional two species, *Ichthyomyzon bdellium* and *Etheostoma vulneratum*.

E.B. Powers of the University of Tennessee sent some specimens to UMMZ that he collected in 1925 from the Holston or Tennessee River. These contained several species of *Moxostoma*.

J.G. Carlson from the University of Tennessee, with T. Kerr, collected June 18-20, 1930 on Stony Creek, Sinking Creek, and SFHR at Bluff City. Carlson obtained the first known specimens of *Etheostoma acuticeps* (Jenkins and Burkhead, 1975), but Fowler (1936) misidentified these specimens as *Nothonotus rufilineatus* (= *Ethesotoma rufilineatum*). According to Taylor (1969), specimens of *Noturus eleutherus* from Carlson's collections were incorrectly designated by Fowler (1945) as a new species, *Shilbeodes gallowayi*. Fowler kept these specimens at the ANSP.

On June 5, 1933, E. D. Reid, Division of Fishes at the U.S. National Museum, catalogued 10 species of fishes from two collections, Laurel Creek, a tributary to the headwaters of the NFHR, and the NFHR in Bland County, Virginia, near its source. Reid returned with G. S. Myers to the NFHR at Broadford on September 12, 1933, from where they catalogued three additional species. In 1937, E. D. Reid returned to the Holston River system with L. P. Schultz, both of the Division of Fishes at the U.S. National Museum. They made a field trip to study the fishes of Virginia. Schultz and Reid collected fishes from the MFHR north of Damascus, Washington County, Virginia, and from a tributary to the SFHR. They retained specimens at the USNM.

From October 14-27, 1938, E. R. Cady of the Tennessee Valley Authority collected fishes in five samples from the Holston River system of Virginia. He collected the MFHR and some of its tributaries (Bear, Cressey, Dickey, and Hungry Mother creeks). Cady also collected Big Moccasin Creek, a tributary to the NFHR. Cady identified many new localities for *Cottus baileyi* (although unrecognized at the time as a valid species) and sent these specimens to UMMZ.

A.R. Cahn collected fishes for the TVA and shipped them to C.L. Hubbs at UMMZ for identification and deposition. Cahn compiled data in cooperation with Hubbs. Cahn hoped to write a paper on the fishes of Tennessee. On October 6-8, 1937, A.R. Cahn and C.C. Davis sampled the NFHR and its tributaries, Big Moccasin, Tumbling, and Wolf creeks. They also worked tributaries to the SFHR (Back Creek and Beaver Creek) and the Watauga River at Elizabethton, Tennessee. Cahn and Davis added *Cyprinus carpio* and *Doration meadiae* (= *Etheostoma jessiae*) to the Holston River cumulative fish list. On November 3, 1937 Hubbs wrote a letter to Cahn announcing a manuscript list of the "Fishes of the Tennessee River system". In late November 1937, Cahn sent a photo to Hubbs of *Acipenser fulvescens* collected at Holston River mile 4.0. It was not until February, 1939, that Hubbs wrote a letter to Cahn saying that he had finally received a specimen of *Acipenser fulvescens* in the UMMZ collection. On February 20, 1939, Hubbs sent a revised, 1939 version, of the manuscript list of "Fishes of the Tennessee River system" to E.R. Kuhne at the Tennessee Department of Conservation (TDC). Kuhne published a booklet titled "Guide to the Fishes of Tennessee and the Mid-South" in 1939. Cahn returned home from a Florida vacation on May 4, 1939, and found copies of the booklet on his desk. The next day he wrote the first of a series of letters to Hubbs concerning that booklet. Cahn resented Kuhne's use of distribution data utilized in the booklet. In a letter written by Cahn, dated May 16, 1939, he expressed his feeling that all of his material had been published without his consultation or permission and finished by

saying, " I must admit it has put a damper on my enthusiasm for further collecting."

Hubbs' letter of May 19, 1939, to Cahn, and Cahn's letter of May 22, 1939, to Hubbs were letters of apology and acceptance, respectively. They remained colleagues for years to come, studying at least peripherally the fishes of the Holston River system.

On October 23, 1936, interest was directed toward Beaverdam Creek, a tributary to the SFHR, after A.D. Holloway collected there. Holloway collected six species, including 26 specimens of *Notropis rubricroceus*, and sent them to UMMZ where they were identified by Hubbs. On August 10, 1938, E.R. Kuhne and J.H. Peyton, from TDC, re-collected Holloway's locality and obtained 10 *Notropis rubricroceus*. On August 11, they collected three miles further upstream in Beaverdam Creek and obtained another 20 specimens of *Notropis rubricroceus*. All of the specimens were sent to Carl Hubbs at UMMZ where they were catalogued.

On April 1, 1940, E. C. Raney and E. A. Lachner collected Dickey's Creek, a tributary to SFHR, the MFHR and its tributaries, and the NFHR. In the MFHR, they collected the future holotype, allotype, and several paratypes of *Cottus baileyi*. They sent their collections to Cornell University.

In June and July 1940, C.J. Chance and J.H. Peyton of the TDC made a survey of tributaries to the Watauga and SFHR in upper East Tennessee, in Carter, Johnson, Sullivan, and Washington counties. These tributaries included Beaverdam, Buffalo, Cobb, Forge, Indian, Kendrick, Laurel, Mill, Roan, Sinking, and Stony creeks, and the Elk River. They may have been the first to collect *Phenacobius crassilabrum*. These men sent their collections to UMMZ.

On August 17, 1940, W. King, while employed at the Great Smoky Mountains National Park as a wildlife technician, sent a photograph of a blue sucker taken from the Watauga River in August, 1940, to C.L. Hubbs at UMMZ. According to Laura Hubbs, the wife of C.L. Hubbs, the record was the first for the Holston River system. In the

summer of 1941, W. King directed North Carolina Wildlife Resources Commission, Fish Division, to survey the Watauga River in North Carolina, (Menhinick et al., 1974), but the survey was halted by World War II. J. R. Bailey made five collections in the Watauga and Elk rivers of North Carolina in August, 1941, and three more collections in August, 1944. Bailey's fishes were sent to UMMZ and the North Carolina State Museum (NCSM) (W.M. Palmer, pers. comm.). In 1949 the Watauga River in North Carolina was again collected by the North Carolina Wildlife Resources Commission, Fish Division, (Menhinick et al., 1974).

In September, 1941, C. W. Tarzewell, C.G. Smith, and Mr. White of the Tennessee Valley Authority conducted a survey of the fishes of the direct tributaries to the Holston River in a systematic manner beginning at HRM 52.3 in Mossy Creek and collecting to the northeast until they reached HRM 111, there they crossed to the north side of the Holston River and continued their collections, moving in a southwesterly direction back to HRM 52.3. These men made one main stream collection in the Holston River. This commendable effort provided a wealth of knowledge about the fishes of the Holston River proper, but in less than two months the TVA closed the gates on Cherokee Dam (at HRM 52.3). This drastically altered the habitat of the Holston River (Pfitzer, 1954). The single main channel collection resulted in the only specimen of *Erimystax cahni* known from the Holston River system, but these specimens from 1941 were not identified for 37 years (Etnier et al., 1979).

R. M. Bailey with J. Chance and R.W. Eschmeyer in 1947 and with G.P. Cooper and J.D. Kilby in 1949 collected several sites along the SFHR and Watauga River in an attempt to identify fish species present there prior to the closure of Watauga and South Holston dams (Pfitzer, 1954; Jenkins and Burkhead, 1975). Bailey was the first and last to collect the duskytail darter in the Holston River system (Jenkins and Burkhead, 1994),

and was first to recognize *Etheostoma acuticeps* as a distinct species (Bailey, 1959). These collections first revealed *Noturus flavus* in the Holston River system (Pfitzer, 1954).

1950-1969

R.D. Ross of Virginia Polytechnic Institute (VPI) made 56 total collections in Virginia of the NFHR (36), MFHR (7), and SFHR (13) from 1953-1958 and reported his findings (Ross and Carico, 1963). Some people that aided Ross in his collections were B. Abbot, F. Burleson, J. Cooper, P.C. Holt, W. Keeton, R.G. Martin, M.T. Masnik, D. Robinson, M.H. Ross, and T.M. Smith.

On June 4, 1952, R.H. Gibbs and Mr. Caswell made three collections of the MFHR in Smyth County, Virginia. Using the information collected, Gibbs (1957, 1961) published two papers dealing with fishes in the subgenus *Cyprinella*, *Notropis spilopterus* and *Notropis galacturus*, respectively. Those papers were products of his doctoral thesis from Cornell University.

From 1951-1954, Pfitzer and colleagues employed by the Tennessee Game and Fish Commission (TGFC) made collections downstream from Cherokee, South Holston, Watauga, and Wilbur reservoirs of the Holston River system (Pfitzer, 1954). Pfitzer noted blue suckers for the last time in the Holston River, downstream from Cherokee Dam.

In 1952-1953, W.S. Woolcott of Carson Newman College collected tributaries to the Holston River in the vicinity of Cherokee Lake and catalogued his specimens at CU (Woolcott, 1953). Woolcott collected Mossy Creek repeatedly.

J. Cairns of the Academy of Natural Sciences in Philadelphia collected fishes in the NFHR in Smyth, Washington, and Scott counties of Virginia, and Hawkins/Sullivan counties, Tennessee, on June 22, 1954 (ANSP, 1966).

On August 24, 1954, C.R. Gilbert made a trip to the Holston River system with E.M. Gilbert. The Gilberts made one collection in the NFHR northeast of Saltville, Virginia, and two collections on the SFHR in Smyth County, Virginia.

In 1958, W.S. Woolcott, then professor at University of Richmond, returned to the Holston River system, collecting the NFHR and MFHR (R.E. Jenkins, in litt.).

On June 9, 1961, W.J. Richards, Mr. Bane, and Mr. Miller made four collections from Laurel Creek, a tributary to the NFHR, the NFHR, and two collections from the MFHR. In 1962 Richards returned to the MFHR with L.W. Knapp and B.B. Collette to collect two more times. Richards was working on his doctoral thesis from CU on the *Etheostoma thalassinum* species group which includes *Etheostoma swannanoa* (Richards, 1963, 1966).

On July 2, 1963, R.D. Ross, W.S. Woolcott, and Mountain Lake Ichthyology Class, accompanied by R.E. Jenkins, collected two sites on the NFHR. These specimens were sent to CU, University of Alabama, University of Richmond, and VPI.

Three quick trips were made into the Holston River from 1963-1964. In August, 1963 E. Kotkas, T. Zorach, and C.F. Tsai of CU collected fishes in Hawkins County, Tennessee, on the NFHR. In 1964, C.C. Swift, Brockelman, and Futuyma made collections of the Watauga River and its tributaries in North Carolina (UMMZ). On September 8, 1964, R.D. Suttkus and J.S. Ramsey collected the SFHR three miles north of Damascus.

In 1967, 1968, and 1969, D.A. Etnier collected the Holston River at HRM 4. Etnier had recently joined the staff at the University of Tennessee in Knoxville. In 1968, Etnier collected the NFHR in Tennessee, with A. Gnilka and C.E. Comiskey. Etnier collected the SFHR in Virginia where he obtained specimens of *Percina aurantiaca*, the only record of this species from that location. Etnier was collecting data for his book on *The Fishes of Tennessee*, which co-authored by W.C. Starnes and published in 1993.

Based on museum records at CU, R.F. Denoncourt made trips into the Holston River system in 1967, collecting the SFHR in Washington County NNW of Damascus and

the NFHR in Scott County, Virginia. Denoncourt was working on his doctoral thesis at CU on *Percina evides* (Denoncourt, 1969).

1970-present

This was a productive time for research in the Holston River. The Tennessee Valley Authority collected the Holston River system from 1971 to 1977 in order to monitor the effects of mercury on the fishes of the NFHR and made over 100 collections on that river (Feeman, 1986). In 1973, J.C. Feeman, R.B. Fitz, and C.F. Saylor collected additional sites in the MFHR, SFHR, Watauga, and mainstream Holston River for the TVA (Feeman, 1980). From 1977-1979, TVA collected around the John Sevier Detention Reservoir.

In the 1970s and 1980s, R.E. Jenkins of Roanoke College and N.M. Burkhead of the National Biological Survey with R.L. Dudley, M.D. Gibson, W.H. Haxo, J.H. Jesse, M.A. Kuhl, E.A. Lachner, M.D. Maulfair, S.P. McIninch, J.A. Musick, D.A. Robotham, and R.E. Wollitz made numerous collections of the Holston River in Virginia and Tennessee. They were gathering information for their book, *The Fishes of Virginia*.

The Cooperative Fish and Wildlife Research Unit (Fishery Unit) at VPI and State University (Virginia Tech), comprising the Virginia Department of Game and Inland Fisheries and the U.S. Fish and Wildlife Service, have added much to our knowledge of the fishes of the Holston River. Those agencies were represented in Holston River research by P.L. Angermeier, R.J. Neves, and J.C. Widlak.

The United States Forest Service in the 1970s, led by M.E. Seehorn, collected Holston River tributaries on Forest Service land. Seehorn concentrated his effort in the smaller tributaries to the NFHR, SFHR, and MFHR.

In January 1978, B.A. Bauer, D.A. Etnier, J.L. Harris, D.L. Neiland, and W.C. Starnes from the University of Tennessee with J.C. Feeman and C.F. Saylor of the TVA

travelled to the UMMZ and identified specimens obtained by the TVA in 37 collections made in 1941 by Tarzwell, Smith, and White in the vicinity of Cherokee reservoir.

In 1965, 1974, 1980, and 1990 scientists from the ANSP collected sites in the SFHR near Kingsport, Tennessee, in the vicinity of Tennessee Eastman. They also collected in the main channel of the Holston River downstream from the confluence of the NFHR and the SFHR.

Since 1987, R.D. Bivens and C.E. Williams of the Tennessee Wildlife Resources Agency have made extensive fish collections in the Holston River system. Their quantitative and qualitative surveys have added much to our knowledge of this river system.

There has been no lack of interest in the Holston River system. Besides regional surveys, excursions into the Holston River from far away have been steady. Some of the visitors to the river system from 1970 to the present include, J.P. Beets, B.H. Bauer, P.B. Brown, D.G. Buth, R.C. Cashner, T.M. Cavender, M. Cavender, C.C. Ciola, W.C. Dickinson, D.J. Eisenhour, L.V. Eisenhour, E.A. Etnier, M.A. Etnier, S. Fraley, K.D. Gardner, C. Hamilton, G.D. Hamilton, J.L. Harris, T.J. Hartman, C.H. Heacock, W.M. Howell, L.G. Hughes, M.H. Hughes, J.E. Johnson, G.J. Kaufman, R. Kirk, B.R. Kuhajda, D.R. Lindbom, C.E. Louton, J.A. Louton, A.D. McKinney, E.F. Menhinick, P.A. Myer, D.L. Nieland, L.M. Page, D.C. Peterson, C. Pittenger, W.J. Rainboth, J.R. Reed, M.G. Ryon, E.M. Scott, C. Stansbury, L.B. Starnes, W.C. Starnes, R.D. Suttkus, J.A. Tranquilli, R.H. Matson, R.L. Mayden, D.A. Turner, W.R. Whitworth, C.A. Williams, J.D. Williams, D. Wilson, J.L. Wilson, and B.S. Wunderlind.

Reports have been made listing fishes in the Holston River system (Academy of Natural Sciences of Philadelphia, 1966; Bailey, J.R., 1977; Bailey, R.M. 1959; Beets, 1979; Bivens, 1984, 1988, 1989; Bivens and Williams, 1990, 1991; Bivens et al., 1992, 1993; Burkhead, 1980; Burkhead and Jenkins, 1991; Cope, 1867, 1868a, 1868b, 1868c;

Edrington et al., 1979; Engels, 1941; Etnier et al., 1979; Feeman, 1980, 1986, 1987; Fowler, 1907, 1924, 1936, 1945; Gilbert, 1969, 1978; Guilday et al., 1978; Haxo and Neves, 1984; Hill et al., 1975, 1989; Jenkins and Burkhead, 1975, 1984, 1994; Jenkins et al., 1971; Jordan, 1889a, 1889b; Jordan and Brayton, 1878; Menhinick et al., 1974; Oakberg, 1973; Richards, 1966; Richardson, 1964; Robins, 1961; Ross and Carico, 1963; Saylor et al., 1988; Saylor and Ahlstedt, 1990; Saylor and Brown, 1987; Saul, 1981; Shields, 1944; Smith and Miller, 1942; Taylor, 1969; Widlak, 1982; Widlak and Neves, 1985; Wilson and Turner, 1982; Woolcott, 1953; Yeager and Tomljanovich, 1990). Dot distribution maps for the range of fish species found in the Holston River system are collectively covered in three recent publications of state ichthyofaunas, featuring North Carolina (Menhinick, 1991), Tennessee (Etnier and Starnes, 1993), and Virginia (Jenkins and Burkhead, 1994). In addition, the *Atlas of North American Freshwater Fishes* edited by Lee et al. (1980) presented dot distribution maps for most of the species found in the Holston River system.

Anthropogenic Changes in the Holston River system

The *natural* system that evolved in the Holston Valley after the Pleistocene was rich in aquatic life. Anthropogenic changes presumably altered that system. The Holston River is an altered system. Abuses to the river system may have begun prior to European encroachment into North America. Chapman et al. (1982) investigated the effects of aboriginal tribes on the Little Tennessee River for the past 10,000 years (both the Little Tennessee and Holston rivers share Fort Loudoun Lake as an outlet) . Some of the perturbations created in the watershed by these early Americans presumably accelerated siltation. Aboriginal peoples inhabited the Holston River valley for several thousand years prior to the arrival of Europeans. Those first arrivals were nomadic hunters and gatherers that camped near rivers in temporary dwellings. Along the NFHR, Pickle (1946) found what he believed to be evidence of paleo-Indians at Saltville, Virginia, in association with mastodon remains. Those hunters should have had little permanent effect on the Holston River water quality. Faulkner (1978) gave a tentative date of occupation of a cave on the SFHR as between 8,000 and 9,000 years BP. When Europeans arrived on the Watauga River in the vicinity of Elizabethton, Tennessee, they noted the presence of the Watauga Oldfields, an area of early aboriginal farming (Ramsey, 1926; Calloway, 1989) which may have created siltation problems for the river system. Siltation might have become a local problem in pre-Columbian times for some species of fishes.

Farms were instituted along the Holston in North Carolina by European settlers in the 1700s (Ramsey, 1926; Calloway, 1989). Wetlands at Saltville, Virginia, were drained as early as 1840 (McDonald, 1985a). Chestnut trees and other arboreal taxa were cut by early settlers (Barclay, 1957). Fish traps (Cobb, 1978; McCoy, 1980) and dams (Jordan, 1889b) were built in the 1800s across the Holston River. Sawmills dumped sawdust into

the Watauga River where it had accumulated and smothered the bottom of pools in 1888 (Jordan, 1889b).

On December 5, 1941, the Tennessee Valley Authority closed Cherokee Dam on the main channel of the Holston River at HRM 52.3 (see Figure 5). Cherokee Dam effectively blocked the upper reaches of the Holston River from the lower reaches. The dam was a large concrete wall without locks, blocking upstream migration of fishes. Due to stagnation in the hypolimnion of the reservoir in summer months there were periods when the discharge from Cherokee would have almost no dissolved oxygen (see "Study Area"). In the early spring, water discharge was too cold for warm water fish species and in the summer the water was too warm for cold water fish species (Pfitzer, 1954). Also, the discharge from the dam would approach negligible flow, adversely affecting fish populations (Pfitzer, 1954; Yeager and Tomljanovich, 1990). Subsequent to the closing of Cherokee Dam came the closing of other TVA storage reservoirs on the Holston River. Boone Dam was closed at the confluence of the SFHR and the Watauga River, Fort Patrick Henry Dam in the Boone tailwaters, South Holston Dam at the confluence of MFHR and SFHR, and Watauga Dam at the junction of Elk River, Roan Creek, and Watauga River (Figure 6). These dams, especially Fort Patrick Henry and South Holston, create the same adverse conditions as described above for the Cherokee tailwaters (Cox, 1986). The Holston River was blocked strategically at bifurcations where more water could be impounded by the TVA. Dam builders have a predilection for river bifurcations as dam sites.

Non-point as well as point source pollution occurs in the South Holston Basin and their sources have been listed by Cox (1986) and the Tennessee Division of Water Quality Control (1977). Tennessee Eastman on the SFHR and North American Rayon Corporation on the Watauga River (Figure 7) are two publicized sources of pollution.

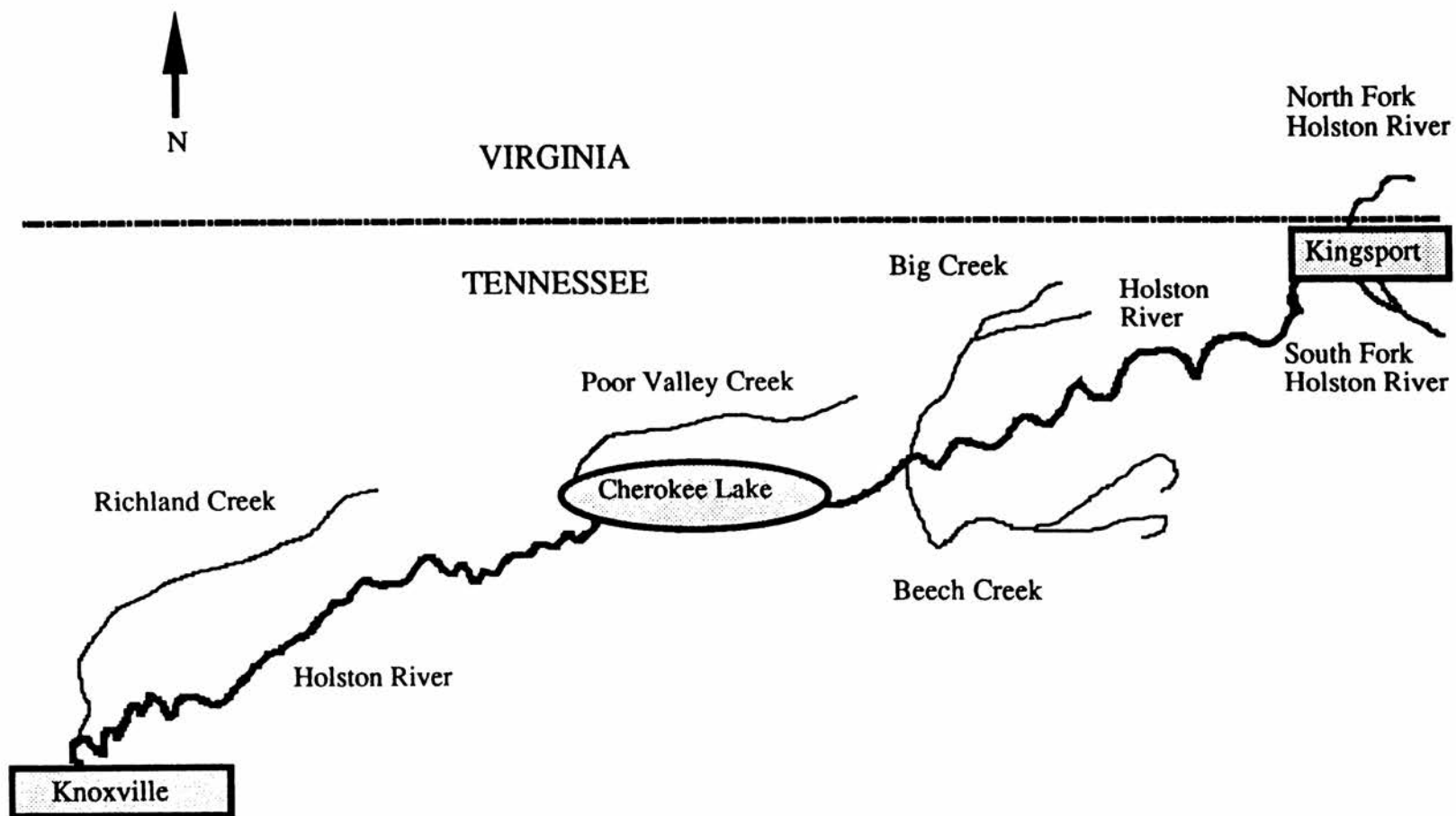


Figure 5. Schematic map of the Holston River proper (HRM 0-142) from Kingsport to Knoxville, Tennessee.

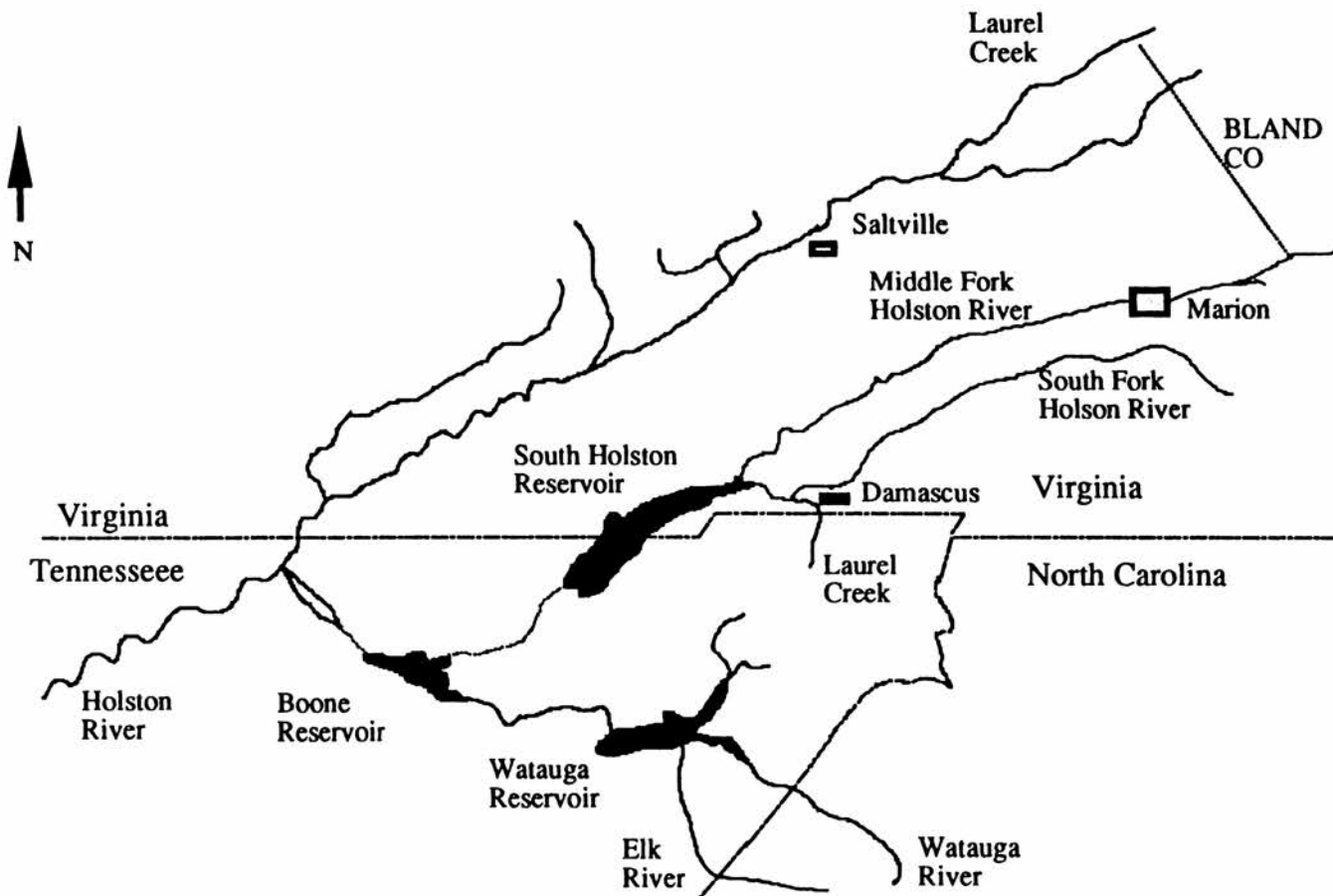


Figure 6. Schematic map of three major TVA storage reservoirs on the upper Holston River system.

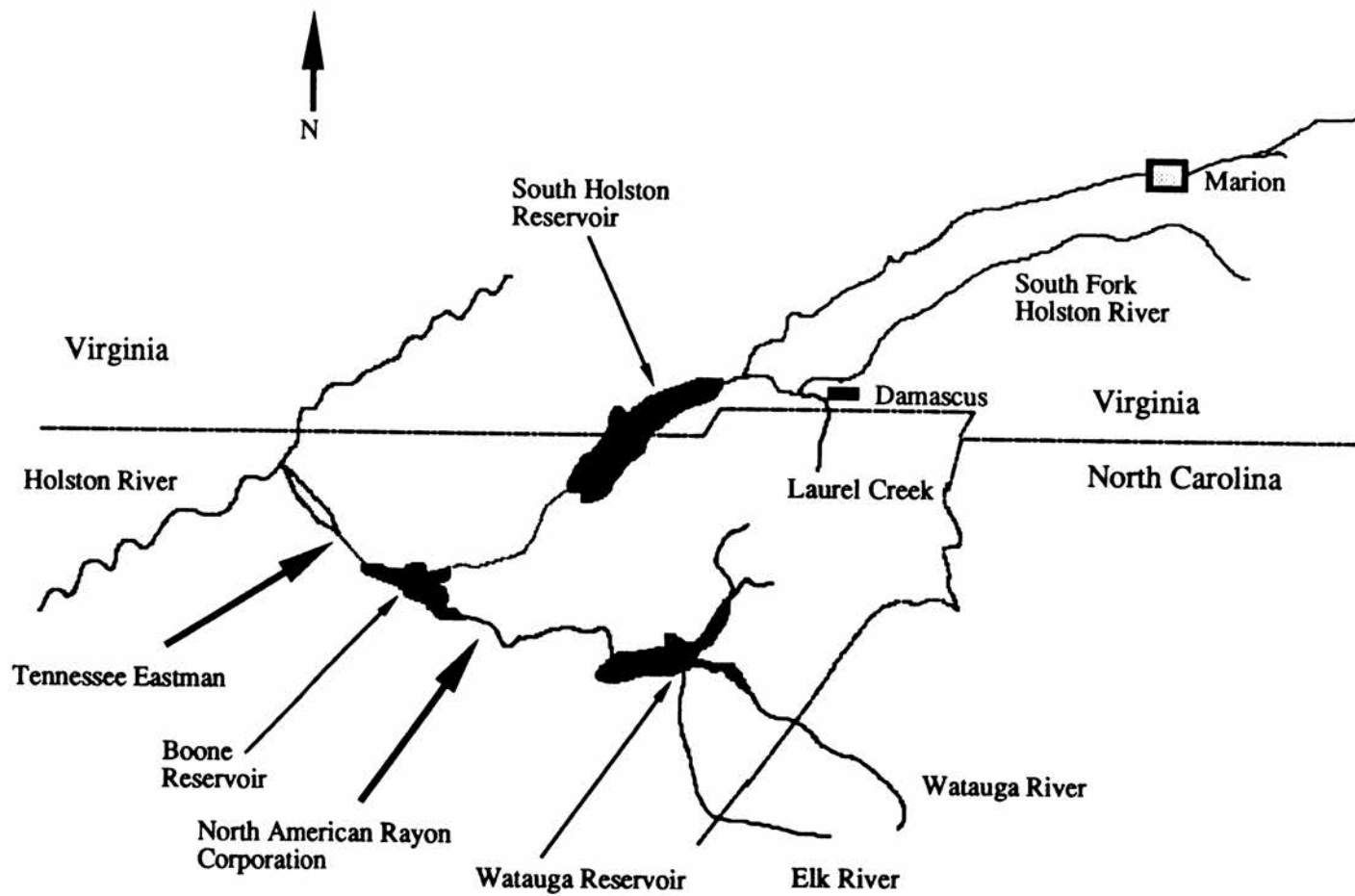


Figure 7. Schematic map depicting locations of Tennessee Eastman and North American Rayon Corporation near the South Fork Holston River.

Tennessee Eastman has seven discharge points into the SFHR in Kingsport, Tennessee, between river km 5.6 and 9.3 (miles 3.5 and 5.8). The company produces synthetic fibers, plastics, and chemicals. Their discharge is equal to 65% of the organic load in the Holston River basin, resulting in tremendous biological oxygen demand (Tennessee Division of Water Quality Control, 1977). The company has released excessive discharges in the past, resulting in fish kills (Cox, 1986). Tennessee Eastman has made a concerted effort to minimize their perturbances on the SFHR by monitoring and controlling fluctuations in their effluent discharge (J.K. Horton, Division of Water Pollution Control, Johnson City Office, pers. comm., 1994).

North American Rayon Corporation (NARC) and Bemberg at Watauga River km 39.3 (mile 24.4) in Wilbur dam tailwaters (treated here as Watauga Lake tailwaters) discharged toxic rayon byproduct effluent into the Watauga River from the 1920s to the present (Horton, pers. comm., 1994). Pfizter (1954) reported that fish could not survive in the effluent from the rayon plants. The Watauga River below the discharge was severely stressed (Cox, 1986). J.K. Horton (pers. comm., 1984) said that the specific cause of the stress was never determined, but that in the past zinc was implicated. Cox (1986) lists the pollutants from NARC as heavy metal contamination, violent pH fluctuations, ammonia, and "unknown chronic toxicants". In 1982, the 96 hour lethal concentration for fifty-percent (LC₅₀) of *Pimephales promelas* subjected to the NARC effluent was less than 5.6% (Cox, 1986). The Water Quality Control Board in Nashville ordered NARC to comply with their N.P.D.E.S. permit, which they did. A trophy trout section of stream now exists directly below the NARC discharge, and J.K. Horton (pers. comm., 1994) believes that the Watauga River is making a significant recovery.

In 1950, the Olin Corporation operated under a subsidiary, Mathieson Chemical Company (a chloralkali plant), at Saltville, Virginia, on the NFHR (Figure 8) at river km 133 (mi 82.5). They utilized a mercury cathode in their electrolytic production of chlorine

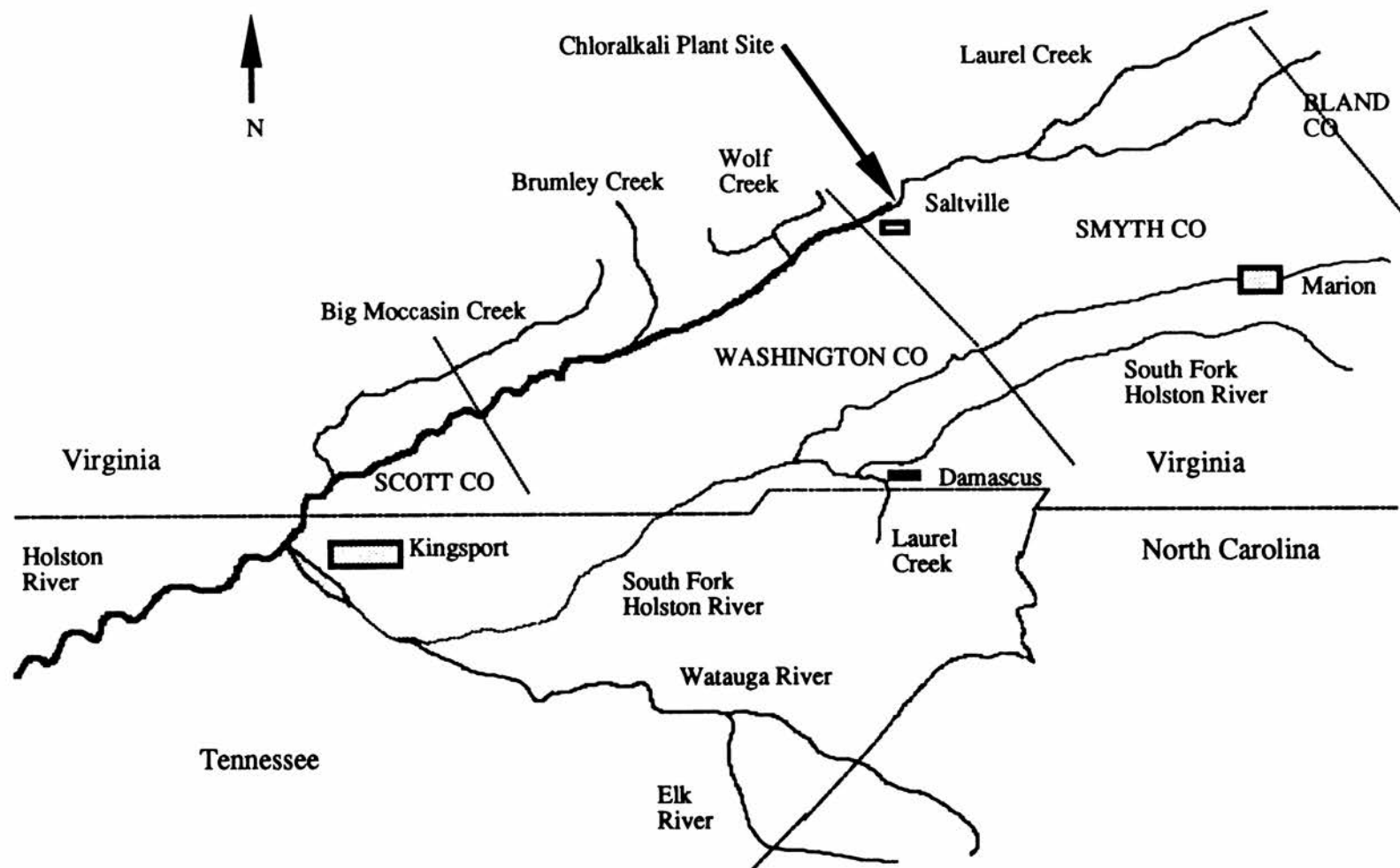


Figure 8. Schematic map of upper Holston River system and location of Olin Corporation's chloralkali plant site on the North Fork Holston River.

and sodium hydroxide from sodium chloride (Hill et al, 1975, 1989; Hildebrand et al., 1980a,b). The electrolytic cells at Olin-Mathieson required more than one million pounds of mercury to function, and 100 pounds of mercury were lost every day as either vapor or metal, some of which went directly into the NFHR (Anon, 1977). This resulted in mercury detectable in fish more than 160 km (100 miles) downstream into Cherokee Lake (Hildebrand et al., 1980a, b). Remediation began in 1972 when the plant voluntarily closed (Ibid.). The substrate at the site was washed and sealed in concrete (Ibid.). According to J.K. Horton (pers. comm., 1994) mercury pollution in the NFHR of Tennessee is not threatening to human health, and J. Burr (pers. comm., 1994) does not consider the mercury levels measured in Cherokee Lake to be a threat to human health. Eating fish from the NFHR is another matter. It is illegal to possess fish from the NFHR in Virginia and Tennessee because of the mercury levels found in the fish (Anon, 1977).

Cox (1986) summarized point and non-point sources of pollution in the SFHR basin. Non-point pollution included agriculture (erosion, animal waste), abandoned mines (iron, manganese, and aluminum), reservoir releases (low DO and thermal loading), construction runoff, failing septic tanks and septage disposal, industrial spills, silviculture, landfill leachate, urban runoff, and acidification trends. Point sources in the SFHR basin are listed in Cox (1986) by state, municipal, and industrial categories.

In review, the NFHR was subjected to mercury contamination from 1950 to 1972. The SFHR was impounded and subjected to toxic effluents. The main channel of the Holston River receives those toxicants and high BOD from the NFHR and SFHR. Contaminated water is impounded for one-third the length of the Holston River proper in Cherokee reservoir. Water flowing through Cherokee Dam fluctuates in temperature, spanning ranges that are neither acceptable to warm water or cold water fishes, and is devoid of oxygen for long periods of time. Given these series of assaults on the Holston River system, it is a testament to the tenacity of fishes that they have survived at all.

Chapter 2

Species List

The purpose of this study was to survey fish collection records from the Holston River proper and three of its principal tributaries—the NFHR, SFHR, and Watauga River. This chapter introduces the results of the survey in an annotated species list. The temporal and spatial distribution of each species of fish known or suspected by me to occur within the Holston River system was compiled and presented in this chapter in phylogenetic order.

Distribution of fishes was based on data collected from books, museum collections, field notes, periodicals, photographs, and environmental assessment reports.

Supplementary collections were made by the author from 1990 through 1994.

The summation of data utilized in this survey is presented in Appendices A through I. References to that tabular compilation of data are made in the species accounts that follow. Distributions of fishes presented for the Holston River system were based on *at least* 1,007 fish collections (as perceived by me) taken from the mainstream of the Holston River proper, NFHR, SFHR, and Watauga River; or in the mouths of tributaries that entered those mainstream water courses. The ambiguity regarding a discrete number of collections reported here arises in the attempt to define a discrete collection. For example, Table G1, column one, reports 300 minutes of electrofishing and was counted as one collection. This raises the question should 10 minutes of electrofishing be considered a fish collection, or should 10 replicates of 10 minutes (100 minutes) be a discrete collection, or should a three-day series of 10 replicates of 10 minutes (300 minutes) be a discrete collection? Furthermore, how can electrofishing (measured in time shocked), hoop-net collections (measured in time fished), gill-net collections (also measured in time fished), and cove rotenone poisoning (measured in area poisoned) be considered equal to

"collections" made by a group of people kicking into a 10 foot long seine (the "typical" method employed by many ichthyologists). The number 1,000 was suggested here only to give a "handle" to the depth of this report, but to have no other significance. It was tempting to make comparisons between collections, but that would not result in an accurate analysis. The weight of evidence in this study came from the variety of methods employed by a variety of collectors over a considerable time span (1867 to 1994).

This work deals with the larger bodies of water in the Holston River system. In the data reduction, collections from the tributaries to these larger water courses were not presented in the Appendices. An exception was made for the TVA preimpoundment collections made by the TVA in the vicinity of Cherokee Dam in 1941, because of its historical significance and because the collections were made in the mouths of the tributaries or within 1-3 miles of the Holston River (Table A9). Records from other tributaries over time were utilized in the species list for a thorough report of collection records. Some species (e.g., *Lythrurus ardens*, *Phoxinus tennesseensis*, *Clinostomus funduloides*, *Salvelinus fontinalis*, and *Etheostoma flabellare*) are more commonly collected in smaller tributaries. The frequency of occurrence of fish species in the river system would be totally misconstrued unless some attention was given to smaller tributaries.

Tables representing fish collections appear in Appendices A through F. Appendices A through E contain data from the Holston River proper, NFHR, SFHR, MFHR, and Watauga River, respectively. Appendix F includes data collected from the TVA cove rotenone samples in five TVA storage reservoirs located in the Holston River system. In Appendix G, the results of three different sampling methods (electrofishing, gill netting, and cove rotenone) employed by TVA in reservoir sampling are compared. Appendix H contains lists of catalogued specimens in museums. Finally, Appendix I contains locality data pertinent to these collections.

Species Account Format

Formatting for this species list was adapted from Boschung (1992). The phylum Chordata and subphylum Vertebrata were centered on the initial page of the list. Classes, orders, and families of fishes inhabiting any portion of the nominal Holston River system are listed, as well as a few species known from the Tennessee River near its confluence with the Holston River. Classes are lettered A, B, C, D, etc. Orders are numbered with Roman numerals. Families are numbered with Arabic numerals. Species are listed within each family alphabetically primarily by genus and secondarily by species epithet within each genus. This classification followed suggestions of Nelson (1984), Robins et al. (1991), Boschung (1992), Etnier and Starnes (1993), and Jenkins and Burkhead (1994). Common names were taken from Robins et al. (1991) for every species recognized by them. Common names of newly described species and undescribed species follow my perception of current usage in the literature.

The presently accepted names of species are centered on the pages, italicized, and followed by the author's name and date of description. Centered below the species name is the common name. The next line of text refers to the original description. This information comes from Collette and Knapp (1966), Taylor (1969), Gilbert (1978), Lee et al. (1980), Robins et al (1991), Boschung (1992), Etnier and Starnes (1993), and Jenkins and Burkhead (1994).

The original binomen (indented and italicized) is followed by the author's name and date of description. Subsequent lines include references in chronological order to synonyms and bibliographic information. A complete synonymy was not attempted here. The synonymy presented should help the reader recognize historical taxonomic names used for specimens reported from the Holston River. For bibliographic references a dash (—) precedes the citation. The dash is not used in references of synonymy.

Annotated Account of Species

Phylum Chordata

Subphylum Vertebrata

A. Class Cephalaspidomorphi (Monorhini)—lampreys

I. Order Petromyzontiformes (Hyperoartii)

1. Family Petromyzontidae (Petromyzonidae)—lampreys

Ichthyomyzon bdellium (Jordan 1885)

Ohio lamprey

Petromyzon argenteus Kirtland 1838. Preoccupied by *Petromyzon argenteus* Bloch 1790. *Fide* Hubbs and Trautman (1937).

Petromyzon bdellium Jordan 1885. Ohio River (Great Miami River). Simple substitution name for *Petromyzon argenteus* Kirtland 1838.

Petromyzon sp.—Cope, 1868c: (239). Parasitic lamprey reported from the Holston River, but not collected.

Ichthyomyzon concolor—Jordan and Evermann, 1896: (11), treated *Petromyzon bdellium* as junior synonym of *Ichthyomyzon concolor*.

Ichthyomyzon bdellium—Hubbs and Trautman, 1937. Taxonomic revision genus *Ichthyomyzon*. Treated *Ichthyomyzon concolor* as a *nomen dubium* and resurrected *I. bdellium*. Holston River material examined.

—Rohde and Lantaigne-Courchene, 1980: (15). Type locality, systematics, distribution, habitat, and range.

Distribution: *Ichthyomyzon bdellium* occurs in the four upper tributaries to the Tennessee River—the Clinch, Powell, French Broad, and Holston rivers, according to Rohde and Lantaigne-Courchene (1980). From the Holston River system, these authors plotted *Ichthyomyzon bdellium* on the upper NFHR and in the Watauga River near the North Carolina border.

All catalogued specimens were collected upstream from the confluence of the NFHR and SFHR (Table H1). Records for this species in Tennessee were reported by Etnier and Starnes (1993:90) downstream from Cherokee Dam, NFHR, and Watauga River. From the NFHR near Saltville, Smyth County, Virginia, Jenkins and Burkhead (1994: 169) confirmed three records of the Ohio lamprey from 1928, 1981, and 1986.

In Virginia, records of this species were confined to the NFHR in Smyth County, (Table B5) where E.D. Cope, reported a parasitic lamprey, *Petromyzon* sp., observed but not captured in 1867 (Cope, 1868c). Cope's record was accepted as *Ichthyomyzon bdellium* by Hubbs and Trautman (1937: 86), while Jenkins and Burkhead (1994: 169) suggested that Cope's specimen may have come from another fork of the Holston River system. Later, a specimen of the Ohio lamprey was catalogued that reportedly was collected from the NFHR upstream from Saltville in Smyth County, Virginia, in 1928 by H.R. Becker (Table B5, H1). R.E. Jenkins (in litt.) indicated that collection labels may have been transposed into that sample, but nevertheless accepted the record. Hubbs and Trautman (1937: 88) were apparently satisfied with the locality data for this particular specimen. J. Widlak collected a specimen of *Ichthyomyzon bdellium* at NFHR mi 86.9 in Smyth County, Virginia, in 1981, and Feeman collected another four specimens from the NFHR at mi 85.2 in 1981 (Feeman, 1986). Feeman's four specimens were lost in transit to R.E. Jenkins. In Tennessee, *Ichthyomyzon bdellium* was confirmed from both the Watauga River of Carter County and its tributaries—Roan Creek in Johnson County and the Doe River in Carter County (Table H1). Menhinick (1991: 39) did not report this species from North Carolina.

Remarks: Ammocoetes require four years to maturity and spend that developmental period in small creeks and rivers (Rohde and Lanteigne-Courchene, 1980); subadults descend into lower courses of larger rivers (Trautman, 1981) and adults prefer small to medium sized mountain streams (Raney, 1952).

Ichthyomyzon castaneus Girard 1858

chestnut lamprey

Ichthyomyzon castaneus Girard 1858. Galena, Illinois (Boschung, 1992) or Galena, Minnesota (Rohde and Lanteigne-Courchene, 1980). See Hubbs and Trautman (1937: 77) for an explanation.

—Jordan and Evermann, 1896: (11).

—Hubbs and Trautman, 1937: (71-80). Description, distribution, and life history.

—Rohde and Lanteigne-Courchene, 1980: (16). Type locality, systematics, distribution, habitat, and range.

Distribution: Rohde and Lanteigne-Courchene (1980) reported *Ichthyomyzon castaneus* in the lower Clinch, but not in the Powell, French Broad, or Holston rivers. In Tennessee, Etnier and Starnes (1993: 91) reported this species from the Clinch and French Broad rivers, but not from the Holston River system. The chestnut lamprey was neither reported from Virginia by Jenkins and Burkhead (1994: 39), nor from North Carolina by Menhinick (1991: 39). In 1993, it was collected (Table H2) from an area called "Forks of the Rivers" — where the Holston and French Broad rivers join to form the Tennessee River proper.

This collection locality is practically but not technically in the mouth of the Holston River.

Remarks: This species surely enters into the mouth of the Holston River and will eventually be collected there. Scott and Crossman (1973) reported that ammocoetes of this species preferred moderate current over a stable bottom of sand and silt, and were found in areas with rooted vegetation.

Ichthyomyzon greeleyi Hubbs and Trautman 1937

mountain brook lamprey

Ichthyomyzon greeleyi Hubbs and Trautman 1937. French Creek, 1.6 km east of Wattsburg, Erie County, Pennsylvania.

Ichthyomyzon hubbsi Raney 1952: (98). Currently considered to be upper Tennessee River derivative of *I. bdellium*.

Ichthyomyzon greeleyi—Vladykov (1973) and Vladykov and Kott (1976). Regarded species indistinguishable from *Ichthyomyzon hubbsi*, which they suppressed.

—Rohde and Lanteigne-Courchene, 1980: (19). Type locality, systematics, distribution, habitat, and range.

Distribution: Rohde and Lanteigne-Courchene (1980) reported *Ichthyomyzon greeleyi* from tributaries to the upper NFHR of Virginia, and Watauga River of Tennessee. In Tennessee, Etnier and Starnes (1993: 93) accepted records of this species from the Watauga River. From Virginia, Jenkins and Burkhead (1994: 171) reported this species in the NFHR and MFHR.

Ammocoetes were catalogued as *Ichthyomyzon hubbsi* (= *Ichthyomyzon greeleyi*) from a 1958 collection in the NFHR (Table H3), but Feeman (1986) considered these as *Ichthyomyzon* sp. based on a personal communication with Jenkins. Jenkins collected *Ichthyomyzon greeleyi* (Feeman, 1986: 6) in Smyth County, Virginia, from the NFHR and MFHR (Table D3). *Ichthyomyzon greeleyi* was collected from the Watauga River and four of its tributaries (Table H3). Menhinick (1991: 39) did not record this species from the Watauga River of North Carolina.

Remarks: This non-parasitic lamprey spends its life in creeks rather than in brooks or rivers (Hubbs and Trautman, 1937). Vladykov (1973) pleaded for the protection of all nonparasitic species of lamprey due to their susceptibility to anthropogenic disturbances.

Lampetra appendix (DeKay 1842)

American brook lamprey

Petromyzon appendix DeKay 1842. Providence (Rhode Island) and the Hudson River (probably a tributary), New York.

Petromyzon marinus—Jordan and Evermann, 1896: (10). Treated *Petromyzon appendix* as a junior synonym of *Petromyzon marinus*.

Entosphenus lamottenii—Hubbs and Trautman, 1937: (22-24). Based on *Petromyzon lamotteni* Lesueur. Assignment was based on Missouri distribution.

Lampetra appendix—Bailey et al., 1980. Name change. Positive identity of *Petromyzon lamottenii* was lost when more than one species of *Lampetra* was discovered in Missouri. Complex terminology resolved by consensus of Bailey (1980), and Vladykov and Kott (1980).

—Rohde, 1980: (23). Type locality, systematics, distribution, habitat, and range.

—Seagle and Nagel, 1982. Life cycle and fecundity in Buffalo Creek, a tributary to the Watauga River, Unicoi and Carter counties, Tennessee.

Distribution: Rohde (1980) recorded *Lampetra appendix* from the upper tributaries to the Tennessee River, the upper NFHR, and the Watauga River in Tennessee— where Etnier and Starnes (1993: 97) included one locality in a tributary to the Holston River proper. *Lampetra appendix* was catalogued from the Holston River proper in 1940 (Table H4). In 1993, *Lampetra appendix* was collected from Poor Valley Creek, a tributary to the Holston River proper (Table H4).

Specimens reported by Ross and Carico (1963) from the NFHR in 1958 are considered *Ichthyomyzon* sp. by R.E. Jenkins (Feeman, 1986). According to Jenkins (in litt.), J. E. Johnson collected *Lampetra lamottei* (= *L. appendix*) from a tributary to the NFHR, Spouts Creek, in 1972. *Lampetra appendix* cannot be verified from the MFHR of

Virginia. Jenkins and Burkhead (1994: 178) only reported this species from the upper NFHR and the upper SFHR in Virginia.

From Table H4, it can be seen that voucher specimens of the American brook lamprey were collected from the SFHR in Smyth County, Virginia, in 1976; from the Watauga River in Carter County, Tennessee, in 1978 and 1988; from Beaver Creek in 1973; and the Doe River in 1988. Seagle and Nagel (1982) studied the life cycle of a population from Buffalo Creek (Watauga River). Menhinick (1991: 39) did not record this species from the Watauga River of North Carolina

Remarks: This non-parasitic species of lamprey develops in mud and sand beds under quiet waters of small creeks, and they spawn as adults in gravel riffles near those beds (Rohde, 1980). Etnier and Starnes (1993: 96) reported that a spawning aggregation was observed in Citico Creek, a tributary to the Little Tennessee River on 5 April. Seagle and Nagel (1982) reported on the American brook lamprey from Buffalo Creek, tributary to the Watauga River, where they noted the beginning of metamorphosis in August and transformation by October in some individuals. Trautman (1981) said that *Lampetra appendix* had greatest populations in streams of highest gradient, but avoided the unglaciated regions of Ohio. All of the habitat in the Holston River proper is unglaciated. Jenkins and Burkhead (1994: 177) reported this species inhabited a range of habitats from warm rivers to brook trout streams in Virginia.

B. Class Osteichthyes-bony fishes

I. Order Acipenseriformes

1. Family Acipenseridae—sturgeons

Acipenser fulvescens Rafinesque 1817

lake sturgeon

Acipenser fulvescens Rafinesque 1817. Great Lakes (Boschung, 1992) or Lake Erie (Lee et al., 1980).

Acipenser rubicundus—Jordan and Evermann, 1896: (106). *Acipenser fulvescens* not recognized.

Acipenser fulvescens—Gruchy and Parker, 1980: (39). Range map.

Distribution: According to Gruchy and Parker (1980), *Acipenser fulvescens* did not occur in the upper Tennessee River tributaries—Clinch, Powell, French Broad, or Holston rivers. This species was not reported from Virginia by Jenkins and Burkhead (1994: 39) nor from the Watauga River in North Carolina by Menhinick (1991).

Etnier et al. (1979) reported that a mainstream trammel net collection from the lower bend of the Tennessee River by TVA between 1937 and 1943 near Decatur, Alabama, contained 58 fishes. Five of those were lake sturgeon, *Acipenser fulvescens*. Eschmeyer et al. (1944) reported a series of TVA gill-netting operations from the main channels of both the Hiwassee and Tennessee rivers near their shared confluence in Chickamauga reservoir in August, 1942. They captured 81 fish of which 24 (29.6%) were lake sturgeon. Eschmeyer (1944), collecting with various seines (800 feet x 8 feet, with 1.5 inch bar mesh; 689 feet x 6.25 feet, with 2.375 inch mesh; and 50 feet long, with .375 wing and .25 inch bag), or poisoning with rotenone, did not produce sturgeon. This suggests that 30 preimpoundment collections by the TVA in the vicinity of Cherokee Dam by seining with 100-, 50-, 25-, and 10-foot seines would not likely obtain sturgeon. Hoop-nets employed by TVA in 1941 (Smith and Miller, 1942) did not capture sturgeon in the

vicinity of Wheeler, Watts Bar, or Cherokee reservoirs. Gill-nets appeared to be the best method to collect sturgeon, but preimpoundment gill-net collections are not available from the Holston River system.

No catalogued specimens of the lake sturgeon from the Holston River were found in this survey. Etnier and Starnes (1993: 100) plotted the occurrence of the river sturgeon at the confluence of the Holston and French Broad rivers on a dot distribution map. A.R. Cahn sent a photograph and head of a sturgeon to C.L. Hubbs at UMMZ in November, 1937. Based on this evidence, Hubbs identified the species as *Acipenser fulvescens* (on file in the UMMZ correspondence of Dr. Hubbs concerning fish collections in Tennessee). Written on the back of the photo was the "length (55")", weight (60#)", and collection data indicating that the specimen was caught on the Holston River "about four miles above Knoxville, Tennessee, on November 11, 1937".

Inference of lake sturgeon distribution is made here. Prior to impoundment, lake sturgeon swam up and down the Tennessee River into rivers like the Holston and French Broad. According to Eschmeyer et al. (1944) the sturgeon lived in deep water habitat in the main channel of the rivers, based on his collecting effort. Upper Tennessee River tributaries contained a rich gastropod and unionid mussel fauna (Lewis, 1870; Dennis, 1984) that would have offered suitable forage for *Acipenser fulvescens*. The precise historical distribution and abundance of the lake sturgeon in the upper Holston River will always be in doubt.

Remarks: Lake sturgeon are large, and mature in 14 to 20 years (Gruchy and Parker, 1980). Commercial fisherman reportedly took many individuals prior to impoundment (Etnier and Starnes, 1993). Greater longevity and late sexual maturity meant that the lake sturgeon was exposed to danger, especially capture by commercial fishermen, for a longer period of time before reproducing than other species. This along with habitat alteration by impoundment has led to the sturgeon's demise in the Holston River system.

Status: The lake sturgeon is extirpated from the Holston River system based on the records sampled here. Starnes and Etnier (1980) reported that *Acipenser fulvescens* was extremely rare or extirpated from the entire Tennessee River system.

According to Starnes and Etnier (1980) the lake sturgeon was listed as Endangered in Tennessee by both the Tennessee Wildlife Resources Agency (TWRA) and Tennessee Heritage Program (THP). It is a candidate for listing by the United States Fish and Wildlife Service. The Endangered Species Committee of the American Fisheries Society (Williams et al., 1989) recommended a status of "Threatened" for the lake sturgeon in the U.S.

Scaphirhynchus platyrhynchus (Rafinesque 1820)

shovelnose sturgeon

Acipenser platyrhynchus Rafinesque 1820a. "Ohio, Wabash, and Cumberland rivers, seldom reaching as high as Pittsburgh; also in Mississippi and Missouri rivers".

—Jordan and Evermann, 1896: (107).

Scaphirhynchus platyrhynchus—Bailey and Cross, 1954: (190-199). Systematics and distribution.

—Lee, 1980: (44). Type locality, systematics, distribution, habitat, and range.

Distribution: This survey did not reveal any reports, observations, or museum specimens of the shovelnose sturgeon from the Holston River system. This species was not reported from North Carolina or Virginia by Bailey and Cross (1954), Lee (1980), Menhinick (1991), or Jenkins and Burkhead (1994: 39).

The shovelnose sturgeon was collected upstream from Muscle (=Mussel) Shoals in the 1940s by TVA (Eschmeyer, 1944; Etnier et al., 1979) and the Tennessee Game and Fish Commission (TGFC) in the early 1950s (Pfitzer, 1954). Recent records do not exist for this species in the upper Tennessee River. Bailey and Cross (1954), plotted two

records of this species from the Tennessee River in northern Alabama near Muscle Shoals at both Wilson and Wheeler reservoirs. Etnier et al. (1979) reported that 58 fishes of which three (5.1%) were shovelnose sturgeon were taken in a trammel net from the Tennessee River near Decatur, Alabama, between 1937 and 1943 by the TVA. From August 4-21, 1942, two gill nets were fished by TVA for 153 hours each at Hiwassee Island approximately in the middle reach of Chickamauga reservoir near the confluence of the Tennessee and the Hiwassee rivers; and from those gill nets 81 fish were taken and identified of which 12 (14.8%) were shovelnose sturgeon (Eschmeyer et al., 1944). In September and October, 1942, Eschmeyer's TVA crew moved upstream to sample fish with gill-nets in the Watts Bar tailwaters (upper Chickamauga reservoir). On September 8-11, 1942, the tailwaters were fished, resulting in just one shovelnose sturgeon out of 253 total fish; and "for several weeks" in October, 1942, were fished again, obtaining one shovelnose sturgeon out of 405 total fish. Pfitzer (1954) reported that shovelnose sturgeon were later collected in the spillway from Douglas Dam on the French Broad River, one specimen taken on June 5-6, 1951, and two taken on October 30, 1953. Pfitzer (1954) was not able not collect this species from the tailwaters of Cherokee Dam on the Holston River, but based on limited successes (one or two individuals per sample) in other tailwaters sampled by Eschmeyer et al. (1944) and Pfitzer (1954), the lack of shovelnose sturgeon from the Cherokee tailwaters sampling does not negate their presence there in or prior to 1953.

The absence of the shovelnose sturgeon in some intensive collection regimes may only reflect the selectivity of various sampling methods. TVA made 30 collections in the vicinity of Cherokee Dam in 1941 utilizing seines, but did not locate the shovelnose sturgeon there. It is probably difficult to capture *Scaphirynchus platyrhynchus* by seine (see account of *Acipenser fulvescens*). TVA hoop-net surveys in the upper Tennessee River in general and Holston River in particular in 1941 did not reveal shovelnose sturgeon. TVA

made 107 hoop-net lifts of the preimpounded "free-flowing" Holston River in the vicinity of Cherokee Lake at two localities; 148 hoop-net lifts from the Tennessee River in the "Watts Bar Area" during partial impoundment of the river at three localities; and 100 hoop-net lifts in Wheeler reservoir, impounded since 1936, and did not capture any shovelnose sturgeon from those samples (Smith and Miller, 1942).

It is likely that the shovelnose sturgeon traveled up the preimpounded Holston River as it did in the French Broad River. C.F. Saylor (pers. comm.) speculated that some of the differences noted in the species lists of the French Broad and Holston rivers may be due to variation between the river depths, the French Broad being generally deeper upstream from its mouth than the Holston River.

Remarks: According to Trautman (1981), *Scaphirhynchus platyrhynchus* avoided tributary streams. Shovelnose sturgeon spawn from April to July at an age of five to seven years in channels of large rivers over gravel substrate. This species lives in the main channel of rivers in strong current over sand or gravel while feeding on aquatic insects (Lee et al., 1980).

Status: Etnier et al. (1979) and Starnes and Etnier (1980) considered this species to be extirpated or extremely rare in the Tennessee River drainage. *Scaphirhynchus platyrhynchus* continues to be common in much of the Mississippi River. It is not afforded protected status by the federal government (USFWS, 1992), the American Fisheries Society (Williams et al., 1989), or the State of Tennessee (Starnes and Etnier, 1980).

2. Family Polyodontidae—paddlefishes

Polyodon spathula (Walbaum 1792)

paddlefish

Squalus spathula Walbaum 1792. Type locality not given.

Polyodon spathula—Jordan and Evermann, 1896: (101-102).

—Burr, 1980: (45-46). Distribution, habitat, and range.

Distribution: *Polyodon spathula* was reported from the Clinch and Powell rivers, and near the Holston and French Broad rivers by Burr (1980). Etnier and Starnes (1993: 105) reported the paddlefish from Tennessee in the Clinch, Powell, French Broad, and Holston rivers; Jenkins and Burkhead (1994: 194) only recorded this species in Virginia from the Powell and Clinch rivers.

No catalogued specimens of *Polyodon spathula* were located from the Holston River. P.W. Parmalee verified the existence of a photograph of this species — reportedly captured in 1915 at HRM 14 (McCoy, 1980: 182). Paddlefish were reported downstream from Cherokee dam (Table A1).

The Tennessee state angling record was established for *Polyodon spathula* in Cherokee Lake at 53.9 lb. (Etnier and Starnes, 1993: 105). Paddlefish were stocked in Cherokee Lake; but were not collected there from 110 TVA cove rotenone samples (Table F2), or in recent (1989-1991) electrofishing and gill netting operations (Table G2).

Remarks: Paddlefish, trying to migrate upstream, congregate in large numbers below Cherokee Dam.

Status: Special Concern by the American Fisheries Society (Williams et al., 1989). In Virginia, the paddlefish was recommended for status of Threatened by Burkhead and Jenkins (1991).

II. Order Lepisosteiformes

1. Family Lepisosteidae—gars

Lepisosteus osseus (Linnaeus 1758)

longnose gar

Esox osseus Linnaeus 1758. "Virginia".

Lepisosteus huronensis—Cope, 1868c: (238-239). Reported seeing the head of a longnose gar caught by a fisherman in the NFHR at Saltville, Virginia.

Lepisosteus osseus—Jordan and Evermann, 1896: (109-110).

—Suttkus, 1963. Systematics, key, synonymy, and description.

—Wiley, 1976. Biogeography.

—Wiley, 1980: (49). Type locality, systematics, distribution, habitat, and range.

Distribution: Wiley (1980) did not report the longnose gar from the Holston River system, but reported the species in the Clinch, Powell, and French Broad rivers. Etnier and Starnes (1993: 112) reported this species from those three rivers in Tennessee, and from the Holston River.

In 1941, longnose gar were collected from Mossy Creek about one mile from the Holston River (Table A9) and from the main channel of the Holston River (Smith and Miller, 1942). *Lepisosteus osseus* was reported downstream from Cherokee Dam (Table A1) and in cove rotenone samples from Cherokee Lake (Table F2, G2, H5), but was not collected in 14 samples taken upstream from Cherokee Lake (Table A10).

Jenkins and Burkhead (1994: 198) reported this species in Virginia from the Clinch, Powell, and Holston river systems. In 1867, a longnose gar was reportedly caught by a fisherman in the NFHR near Saltville in Smyth County, Virginia (Cope, 1868c). This was the basis for the only record of *Lepisosteus osseus* from the NFHR (Jenkins and Burkhead, 1994). The longnose gar was not reported from 211 collections from the NFHR made after 1867 (Table B1).

Bone elements of *Lepisosteus* sp., dated 1,800 to 2,900 BP, were recovered from the Eastman Rockshelter adjacent to the SFHR at Kingsport, Tennessee (Manzano, 1986). Bones identified as *Lepisosteus osseus*, dated between 555 ± 185 years BP, were collected from Baker Bluff Cave near the confluence of SFHR and Watauga River (Guilday et al., 1978), but *Lepisosteus osseus* was not collected in 103 samples of the lotic SFHR in Tennessee and Virginia from 1888 through 1993 (Table C1), or from cove rotenone, gill-netting, and electrofishing in South Holston Lake (Table F4, G3)

From the lotic Watauga River downstream from Watauga Dam, the longnose gar was observed in only one of 33 collections from 1888 through 1993 (Table E1, E2) and that was in 1988 from Carter County, Tennessee. In Boone Lake *Lepisosteus osseus* was collected in cove rotenone samples in 1961, 1982, and 1983 (Table F1), and by both gill-netting and electrofishing operations in 1991 (Table G1). The longnose gar was not collected in cove rotenone samples from Fort Patrick Henry (Table F3), or from cove rotenone, gill-netting, and electrofishing in Watauga Lake (Table F5, G4).

Remarks: This is the only species of gar confirmed from the entire Holston River system, but the spotted gar may eventually be detected there. The scarcity of longnose gar in samples from the SFHR and South Holston Lake is noteworthy. Its absence from samples from Fort Patrick Henry and Watauga reservoirs, and presence in samples from Boone Lake, situated between the other two reservoirs on the Watauga River, is interesting.

III. Order Osteoglossiformes

1. Family Hiodontidae—mooneyes

Hiodon tergisus Lesueur 1818

mooneye

Hiodon tergisus Lesueur 1818. Ohio River (Boschung, 1992) or Ohio River at Pittsburgh, Pennsylvania, and Lake Erie at Buffalo, New York (Gilbert, 1980).

—Jordan and Evermann, 1896: (413).

—Gilbert, 1980: (75). Systematics, distribution, habitat, and range.

Distribution: Gilbert (1980) reported *Hiodon tergisus* from the confluence of the French Broad and Holston rivers, but not from the Powell or Clinch Rivers. Etnier and Starnes (1993: 118) plotted French Broad and Holston river distributions agreeing with Gilbert, but also indicated Clinch and Holston river populations — from Cherokee Lake, Cherokee tailwaters, and the NFHR of Tennessee. *Hiodon tergisus* was not listed by Jenkins and Burkhead (1994) from Virginia, or by Menhinick (1991) from the Watauga River in North Carolina.

In 1941, *Hiodon tergisus* was not encountered in 30 seining samples by TVA in the vicinity of Cherokee Lake (Table A9); but appeared in their hoop-net samples (Smith and Miller, 1942). In 1953, *Hiodon tergisus* was collected in a rotenone sample made by the TGFC downstream from Cherokee Dam at HRM 44 (Pfitzer, 1954). Specimens were collected and catalogued recently (1977, 1983, and 1984) downstream from Cherokee Dam (Table H6). Mooneyes were first observed in TVA cove rotenone samples from Cherokee Lake in 1963 (Table F2). *Hiodon tergisus* was not reported upstream from Cherokee Lake in the Holston River system, based on this study (Appendices B through G). Etnier and Starnes (1993) reported the mooneye erroneously from the NFHR in Tennessee.

V. Order Anguilliformes

1. Family Anguillidae—freshwater eels

Anguilla rostrata (Lesueur, 1817)

American eel

Muraena rostrata Lesueur 1817a. Cayuga Lake, New York.

Anguilla chrysypa—Jordan and Evermann, 1896:(348). *Anguilla rostrata* was treated as a junior synonym of *Anguilla chrysypa*.

Anguilla rostrata—Lee, 1980: (59-60). Dot distribution map.

Distribution: Lee (1980) did not record the American eel from the upper Tennessee River tributaries—Clinch, Powell, French Broad, or Holston rivers. A 2.1 kg female *Anguilla rostrata* was reported from HRM 0.2 in 1981 by Wilson and Turner (1982). This record, apparently overlooked by Etnier and Starnes (1993), was the only report of an American eel from the Holston River system uncovered in this survey. Wilson (pers. comm., 1994) could not locate the specimen photographed in his article, but another specimen of the American eel caught by a fisherman in 1960 was catalogued from Fort Loudoun reservoir (UT 49.2). Jenkins and Burkhead (1994:206) did not report *Anguilla rostrata* from the Holston River system in Virginia.

Remarks: The American eel is a catadromous species that spawns at sea after most of its life cycle has been completed in either fresh or brackish water (Lee, 1980). *Anguilla rostrata* would not be able to negotiate passage upstream around Cherokee Dam, although it could migrate upstream from the ocean through the Tennessee River proper due to locks on the TVA mainchannel dams. Bait bucket introductions would allow this species access to storage reservoirs on the Holston River. R.D. Bishop (pers. comm.) reported that the American eel was used as bait in Norris Lake on the Clinch River, and it was possible that the same was true on Cherokee Lake.

V. Order Clupeiformes

1. Family Clupeidae—herrings

Alosa chrysochloris (Rafinesque 1820)

skipjack herring

Pomolobus chrysochloris Rafinesque 1820a. Ohio River.

—Jordan and Evermann, 1896: (425).

Alosa chrysochloris—Bailey et al., 1954: (119).

—Burgess, 1980: (63). Type locality, distribution, and biology.

Distribution: Burgess (1980) did not report the skipjack herring from the Clinch or Powell rivers, but plotted it near the Holston and French Broad rivers. Etnier and Starnes (1993: 124) reported it in the Holston River (in the Cherokee tailwaters); in the Clinch River (downstream from Norris Dam); and in the French Broad (downstream from Douglas Dam). *Alosa chrysochloris* was not reported from the Holston River system in North Carolina (Menhinick, 1991) or Virginia (Jenkins and Burkhead, 1994: 39).

Alosa chrysochloris specimens have not been catalogued from the Holston River system, based on this survey. The skipjack herring was collected in the Cherokee tailwaters in 1951 and 1953 by TGFC (Pfitzer, 1954); on August 1, 1967, by D.A. Etnier and the University of Tennessee Ichthyology Class at HRM 6 (Table A2); in 1989 by TVA at HRM 52 (Table A7); and in the 1990s by anglers G.R. Dinkins, S.J. Fraley, and J.R. Shute around HRM 4-6 (pers. comm.). Skipjack herring were not collected in 357 samples from Cherokee Lake from 1940 to present (Table A8). This migratory species is apparently restricted within the Holston River system to the area downstream from Cherokee Dam, based on its absence from over 1,000 collections upstream from Cherokee Dam from 1867 through 1993 (Appendix B-G).

Remarks: Burgess (1980) provided the following synopsis—the skipjack herring is a migratory species, preferring clear, deep water; it probably spawns in the main channel over gravel and sand, lives about four years, and is piscivorous as an adult.

Alosa pseudoharengus (Wilson 1811)

alewife

Clupea pseudoharengus Wilson 1811. Probably Delaware River at Philadelphia, Pennsylvania.

Pomolobus pseudoharengus—Jordan and Evermann, 1896: (426).

Alosa pseudoharengus—Svetovidov, 1964: (118-130). Synonymized *Pomolobus* with *Alosa* (Burgess, 1980).

—Burgess, 1980: (65). Distribution, systematics, and biology.

—Strange et al., 1987. Biology in Watauga Lake.

Distribution: Etnier and Starnes (1993: 125) indicated the presence of the alewife in the Holston River of Tennessee in three TVA storage reservoirs — Cherokee Lake, Watauga Lake, and Boone Lake. This agrees with information collected in this survey. TWRA catalogued specimens of the alewife from Cherokee Lake in 1986 (Appendix H7). The alewife was reported from TVA cove rotenone samples of Cherokee Lake in 1984 and 1991 (Table F2). In 1987 the TVA collected this species at HRM 118, upstream from Cherokee Lake (Table A10).

This species is established in some of the Holston River storage reservoirs, but is rarely collected in the lotic waters of the system. *Alosa pseudoharengus* was not collected in the NFHR (Table B1), SFHR (Table C1), MFHR (Table D1), or Watauga River (Table E1). The alewife was introduced into Watauga Lake in 1976 (Etnier and Starnes, 1993: 26); and was collected from cove rotenone samples of Watauga Lake in 1979 and 1980 (Table F5), from Boone Lake downstream from Watauga Lake in 1982-1983 (Table F1),

and in Fort Patrick Henry Lake downstream from Boone Lake in 1985 (Table F3).

Voucher specimens of the alewife were collected from Tennessee in Boone Lake of Sullivan County in 1990, and from Watauga Lake of Carter County in 1984 (Appendix H7). *Alosa pseudoharengus* was not collected from TVA cove rotenone samples of South Holston Lake (Table F4), nor from TVA gill-netting and electroshocking samples made there in 1991 (Table G3).

Remarks: Scott and Crossman (1973) warned that alewife populations in lake situations can explode, resulting in massive die-offs. Burgess (1980) described the alewife as an anadromous species with landlocked populations feeding on zooplankton in lakes and spawning in the spring in moving water. Etnier and Starnes (1993) reported that the life span in landlocked populations was 5-6 years, and that males spawn beginning at 1-2 years and females at age 3. Strange et al. (1987) studied the biology of *Alosa pseudoharengus* in Watauga Lake.

Dorosoma cepedianum (Lesueur 1818)

gizzard shad

Megalops cepediana Lesueur 1818. Presumably, Chesapeake and Delaware bays.

Dorosoma cepedianum—Jordan and Evermann, 1896: (416).

—Miller, 1960. Taxonomy.

—Megrey, 1980: (69). Distribution, life history, and systematics.

Distribution:

According to Megrey (1980: 69), *Dorosoma cepedianum* was historically widespread in the Mississippi Valley. Etnier and Starnes (1993: 127) reported this species throughout the Holston River in Tennessee. Gizzard shad were present in virtually all of the cove rotenone samples taken by the TVA in Holston River storage reservoirs — Boone

(Table F1), Cherokee (Table F2), Fort Patrick Henry (Table F3), South Holston (Table F4), and Watauga (Table F5).

Jenkins and Burkhead (1994: 214) reported this species in the lower stretches of the NFHR, MFHR, and SFHR of Virginia. *Dorosoma cepedianum* was collected in NFHR in 1954 from Hawkins/Sullivan counties, Tennessee, but was absent in 12 subsequent samples through 1991 (Table B2). In Virginia, it was collected in Scott County by various collectors (Table B3) and in one of 44 collections made in Smyth County; it did not occur in 94 collections of the NFHR made within Washington and Bland counties (Table B1).

The Gizzard shad was collected downstream from South Holston Lake in 1980 from Sullivan County, Tennessee (Table C3). It was collected upstream from the reservoir in Washington County, Virginia, in the SFHR in collections made from 1965 to 1980 (Table C4) and in the lower MFHR from 1967 to 1986 (Table D2). The lotic collection records of gizzard shad in the SFHR and MFHR are likely related to the proximity of those collection sites to South Holston Lake, because they were not collected further upstream in Smyth County in either the SFHR or MFHR (Table C5, D3).

Remarks: The gizzard shad is an important forage fish in reservoir situations—such as Cherokee Lake (Humphreys, 1983). According to Etnier and Starnes (1993: 127), gizzard shad grow rapidly and become unavailable as prey to black basses (*Micropterus*), but they remain available to larger predators such as the striped bass, *Morone saxatilis*. *Dorosoma cepedianum* feed on primary producers (phytoplankton), as well as secondary producers (zooplankton), and detritus. Gizzard shad spawned with rising water temperature in the spring from April through June (Megrey, 1980). In mid-April, 1943, Shields (1944) observed large numbers of gizzard shad migrating out of Cherokee reservoir upstream into the SFHR and Watauga River.

Dorosoma petenense (Günther 1867)

threadfin shad

Meletta petenensis Günther 1867. Lake Peten, Guatemala.

Dorosoma petenense—Jordan and Evermann, 1896: (417).

—Burgess, 1980: (70). Map of transplanted populations.

—Humphreys, 1983. Severe winter-kill in Cherokee Lake.

Distribution: Etnier and Starnes (1993: 128) reported the threadfin shad near TVA storage reservoirs in the Holston River system. TVA collected specimens of threadfin shad in cove rotenone samples in Cherokee Lake from the 1950s through 1991 (Table F2).

Dorosoma petenense was collected and catalogued from upstream collections in the main channel of the Holston River in 1990 (Table A10).

Based on this study, *Dorosoma petenense* was absent from collections throughout the entire NFHR (Table B1). *Dorosoma petenense* was frequently collected in cove rotenone samples of South Holston Lake (Table F4). Upstream from the reservoir, it was only collected in the SFHR of Washington County, Virginia, in 1973 (Table C4); but was not collected in the lotic MFHR in Virginia (Table D1). This agrees with the distribution given by Jenkins and Burkhead (1994: 216-217) for the threadfin shad in Virginia.

Dorosoma petenense was introduced into Watauga Lake on May 8, 1953 (Pfitzer, 1954); and was collected from the Watauga tailwaters in 1988 in Carter County, Tennessee (Appendix H9). This shad was more frequent in collections of Watauga Lake (Table F5), than in Boone Lake (Table F1); it was absent from Fort Patrick Henry Lake collections from 1954 through 1985 (Table F3).

Remarks:

The threadfin shad is a planktivore introduced into the Holston River system (Burgess, 1980). It is intolerant of cold water (Griffith, 1978), and spawns at two years of age (Etnier and Starnes, 1993).

V. Order Cypriniformes

(Ostariophysi, in part)

1. Family Cyprinidae—carps and minnows

Campostoma anomalum (Rafinesque 1820)

central stoneroller

Rutilus anomalus Rafinesque 1820a. Licking River, Kentucky.

Leuciscus prolixus Storer, 1845.

Chondrostoma pullum Agassiz, 1854.

Campostoma anomalum—Cope, 1868c: (235). "Abounds" in Holston.

—Jordan, 1889b: (144). Everywhere; common in Holston.

—Jordan and Evermann, 1896: (205-206).

—Fowler, 1924: (389). In Holston River.

—Burr and Smith, 1976. Subspecies.

—Beets, 1979. Population study in three tributaries to the Holston River (Elk River, Roan Creek, and Doe Creek); and two tributaries to the Nolichucky River.

—Burkhead, 1980. Life history in three tributaries to the Holston River (Elk River, Roan Creek, and Doe Creek); and two tributaries to the Nolichucky River.

—Burr, 1980: (143). Type locality, systematics, distribution, habitat, and range.

Distribution: Stonerollers are ubiquitous in Holston River collections through time. An example of their frequency of occurrence is taken from the TVA 1941 preimpoundment survey in the vicinity of Cherokee Lake — where stonerollers were present in 29 of 30 samples (Table A9). Catalogued specimens from twenty-five tributaries to the Holston River proper were collected in 1941 by the TVA and are housed at UMMZ (Table H10). Specimens collected in 1952 and 1953 from Mossy Creek and Lost Creek are catalogued at CU. Recently (1990-1991), specimens were collected from tributaries (Buffalo Springs, Flat Creek, Poor Valley Creek, and Roseberry Creek) to the Holston River proper and

catalogued at UT. Stonerollers collected upstream from Cherokee Lake in 1990 (Table A10) and from the Cherokee tailwaters downstream from Cherokee dam in 1991 (Table A1) are also catalogued at UT (Table H10).

Cope (1868c) and Jordan (1889b) found *Campostoma anomalum* to be abundant in the NFHR. Feeman (1980, 1986) reported stonerollers as the most important fish based on frequency of capture, absolute numbers, and biomass in the NFHR. Stonerollers are catalogued from tributaries to the NFHR including Beaver, Laurel, and Big Moccasin creeks (Table H10).

Catalogued specimens of *Campostoma anomalum* from the MFHR were located from both Smyth and Washington counties, Virginia, as well as Hawkins and Sullivan counties, Tennessee (Table D1, H10). Catalogued specimens are also preserved from Bear and Byer creeks, tributaries to the MFHR (Table H10). *Campostoma anomalum* is catalogued from the main channel SFHR in Smyth and Washington counties in Virginia and Sullivan County, Tennessee (Table C1); and also from SFHR tributaries — Beaver, Beaverdam, Dicky, Horse, and Laurel creeks. Specimens of stonerollers are catalogued from the main channel of the Watauga River in Watauga County, North Carolina, as well as from Johnson and Carter counties, Tennessee (Table E1), and tributaries to the Watauga River (Table H10).

Remarks: The stoneroller is utilized as a game fish and food source by people in the Holston River system, especially in Carter, Johnson, and Sullivan counties. A study by Beets (1979) and Burkhead (1980) was funded by TWRA to study abundance and life history in the Holston River system, especially the SFHR and Watauga rivers.

Carassius auratus (Linnaeus 1758)

goldfish

Cyprinus auratus Linnaeus 1758. Chinese and Japanese waters.

Carassius auratus —Jordan and Evermann, 1896: (201).

—Hensley and Courtenay, 1980: (147). Distribution, taxonomy, and biology.

Distribution: Although the goldfish is native from eastern Europe through China, it has been reported from 48 North American states (Hensley and Courtenay, 1980). Etnier and Starnes (1993: 142) reported goldfish from TVA reservoirs in the Holston River system of Tennessee. *Carassius auratus* was absent in the preimpoundment survey in the vicinity of Cherokee Lake in 1941 by the TVA (Table A9), but appeared in cove rotenone samples of Cherokee Lake in the 1960s, 1970s, 1980s, and 1990s (Table F2). Goldfish were absent from eight cove rotenone samples in Fort Patrick Henry Lake from 1954 through 1985 (Table F3), but were present in rotenone samples of Boone Lake in the 1950s and 1960s (Table F1), South Holston Lake in the 1960s (Table F4), and Watauga Lake in 1971 (Table F5).

The goldfish was collected in NFHR of Scott County, Virginia, by TVA in the 1970s and N.M. Burkhead in the 1980s (Table B3). Except for a record reported by Jenkins and Burkhead (1994: 277) in the SFHR of Smyth County, Virginia, *Carassius auratus* was absent from collections in the lotic SFHR (Table C1), MFHR (Table D1), and the Watauga River (Table E1).

Remarks: Goldfish live in oxygen-deficient waters containing abundant vegetation where they lay their adhesive eggs (Hensley and Courtenay, 1980). Goldfish are omnivores that feed on phytoplankton as adults and on zooplankton and insect larvae as young. *Carassius auratus* is dispersed through releases from fish hatcheries, outdoor ponds, bait buckets, and household aquaria.

Clinostomus funduloides Girard 1856

rosyside dace

Clinostomus funduloides Girard 1856. Potomac River, Washington, D.C.

Leuciscus vandoisulus—Jordan and Evermann, 1896: (239-240). *Clinostomus funduloides* was treated as a junior synonym of *Leuciscus vandoisulus*.

Clinostomus f. funduloides—Ross and Carico, 1963: (9-11). Record from SFHR is first record in the Tennessee River system.

—Gilbert and Lee, 1980: (149). Type locality, systematics, distribution, habitat, and range.

Distribution: *Clinostomus funduloides* was reported by Gilbert and Lee (1980) from the Holston, Clinch, and Powell rivers in Virginia, and the French Broad River in North Carolina, but not from those rivers in Tennessee. This assessment was in agreement with Etnier and Starnes (1993: 143), Jenkins and Burkhead (1994: 292), and Menhinick (1991: 61).

Clinostomus f. funduloides was probably introduced into the Holston River system. It was not collected in Dickey Creek, a tributary to SFHR in Smyth County, Virginia, in 1940 by E.A. Lachner and E.C. Raney, but was collected there in 1957 by R.D. Ross (Ross and Carico, 1963). *Clinostomus funduloides* was collected from the Watauga River in North Carolina in 1964, and from two tributaries to the NFHR in Virginia — Lick Creek in 1976 (Jenkins, in litt.) and Laurel Creek in 1993 (Table H11).

Remarks: *Clinostomus funduloides* is represented by three subspecies in the Tennessee River system. *Clinostomus funduloides* usually inhabits clear to turbid streams of small to medium size (Gilbert and Lee, 1980). From the upper Tennessee River, populations of the rosyside dace were scattered and usually occurred in clear, cool to cold, medium sized streams (Jenkins and Burkhead, 1994: 292).

Cyprinella galactura (Cope 1868)

whitetail shiner

Hypsilepis galactura Cope 1868. Proc. Acad. Nat. Sci. Phila. (1867) 19: 156-166 (160-161). Holston River system, Virginia. This species is abundant in the tributaries of the Holston River in Virginia. Many specimens are in the museum of the Academy.

Leuciscus kentuckiensis Cope in Günther, 1868a: 1-512 (251). Specimens from Holston River collected by Cope, 1867. According to Gibbs, 1961: (338).

Hypsilepis galacturus—Cope, 1868c: (229). Abundant; one of most common fish in main channel of Holston River.

Notropis galacturus—Jordan, 1889b: (145). Abundant in Holston.

—Jordan and Evermann, 1896: (279). Refers to specimen from Cope's collection USNM 14981 as "type" with "Holston River, Virginia" as locality.

Erogala galactura—Fowler, 1936: (111). Stony Creek near Carter, Carter County, Tennessee.

—Gibbs, 1961: 337-354 (339). Redescription. Claims designation of Lectotype: USNM 14981 (See above—Jordan and Evermann, 1896). Paralectotypes: ANSP 3381-3444 (reported as syntypes); reports locality: "in North Carolina".

—Gilbert, 1978: 1-104 (45). Reported that Gibbs' (1961:339) designated Lectotype "almost certainly came originally from the ANSP type series", from "Holston River in Virginia".

—Gilbert and Burgess, 1980: (266). Type locality (Holston River, Virginia), systematics, distribution, habitat, and range.

Cyprinella galactura—Mayden, 1989: (80-82). Revision.

Distribution: Etnier and Starnes (1993: 151) reported the whitetail shiner in the Holston River system of Tennessee. Jenkins and Burkhead (1994: 359) plotted this species in Virginia in the NFHR, SFHR, and MFHR.

In 1941, the whitetail shiner appeared in 40% of the samples in the vicinity of Cherokee Dam (Table A9, H12). After impoundment it was collected downstream from Cherokee Dam only once (Table A1, A2).

Catalogued specimens of *Cyprinella galactura* (Table H12) were taken from the main channel NFHR in Smyth (Table B5), Washington (Table B4), and Scott (Table B3) counties, Virginia, and Hawkins/Sullivan (Table B2) counties, Tennessee. Specimens were first collected by Cope who considered this species to be one of the most common in the main channel of the Holston River (NFHR) in 1867 (Cope, 1868c).

In 1947, *Cyprinella galactura* was present in four of four samples in the vicinity of South Holston dam, but was absent from collections from the South Holston tailwaters from 1953 through 1993 (Table C3). In Virginia, upstream from South Holston Lake, *Cyprinella galactura* was collected from 1947 to the present in the unimpounded SFHR of Washington County (Table C4), and from the MFHR in both Smyth (Table D3) and Washington (Table D2) counties (Appendix H12).

Cyprinella galactura was also present in three of three samples of the Watauga River near Watauga dam in 1947, but was not collected in the tailwaters from 1953 through 1991 (Table E2). It was collected from 1947 and the 1970s in the free-flowing Watauga River upstream from Watauga Lake in Johnson County, Tennessee (Table E3), and from 1941 through 1991 by seven of eight collectors in the Watauga River of North Carolina (Table E4). *Cyprinella galactura* was collected from all the TVA storage reservoirs in cove rotenone samples (Appendix F), except for Fort Patrick Henry reservoir (Table F3). The whitetail shiner was collected in Fort Patrick Henry tailwaters (SFHR) at Kingsport, Tennessee, from 1974 to 1991 (Table C2).

Cyprinella monacha (Cope 1868)

spotfin chub

Ceraticthys monacus Cope 1868c. J. Acad. Nat. Sci. Phila., ser. 2, 6: 207-247 (227). North Fork Holston River, vicinity of Saltville. Name misspelled in heading of description but spelled "*monachus*" in Cope's text. Cited as rare in Washington County, Virginia.

Hybopsis monachus—Jordan, 1889b: (146). Scarce in Holston River.

Hybopsis monacus—Jordan and Evermann, 1896: (318).

Hybopsis monachus—Fowler, 1924: (409). Reports five "Types" at ANSP, but no catalogue numbers given.

Hybopsis monacha—Jenkins and Burkhead, 1980: (192). Type locality, systematics, distribution, habitat, and range.

—Jenkins and Burkhead, 1984. Reported five syntypes (ANSP 2036-2040). Geochronography (historical and current biogeography). Holston distribution.

Erimystax monacha—Mayden, 1989: (19).

Cyprinella monacha—Williams et al., 1989.

Distribution: Menhinick (1991: 67) did not report this species from the Watauga River of North Carolina. Jenkins and Burkhead (1994: 355) reported that the spotfin shiner was collected in Virginia from the NFHR, MFHR, and SFHR, and speculated that it may have occurred in the Clinch and Powell rivers in historic times. Etnier and Starnes (1993: 154) reported Tennessee records of the spotfin chub in the Holston River proper upstream from Cherokee Lake, in the NFHR, and SFHR at South Holston dam.

In 1992, *Cyprinella monacha* was reported by the TVA at HRM 118 (Table A10). Catalogued specimens of *Cyprinella monacha* are known from the NFHR in all the counties that it flows through in Virginia—Smyth from 1867 to 1954 (Table B5), Washington from 1981 to 1990, and in Scott from 1970 to 1987 (Tables B3, B4). It was catalogued from

the NFHR in Hawkins/Sullivan counties, Tennessee from 1954 to 1975 (Table B2).

From the data available from NFHR collections (Appendix B), it appears that the spotfin chub was adversely affected by the mercury pollution at Saltville, which agrees with the assessment of Burkhead and Jenkins (1991) and Jenkins and Burkhead (1994). Since abatement, *Cyprinella monacha* seems to be repopulating the upper reaches of the NFHR towards Saltville (Burkhead and Jenkins, 1991; Jenkins and Burkhead, 1994).

Specimens of the spotfin chub are catalogued from all four collections made in 1947 from the SFHR in the vicinity of South Holston dam (UMMZ 157505, 157534, 157561, 157595); but this fish was not collected in 10 subsequent samples from the SFHR in the South Holston tailwaters from 1953 through 1993 (Table C3). W.H. Haxo collected specimens of *Cyprinella monacha* upstream from South Holston reservoir in the MFHR in 1984 and catalogued them into the museum at Roanoke College (Haxo and Neves, 1984).

Remarks: The spotfin chub is apparently making a comeback in the NFHR since abatement of the mercury pollution from Saltville, Virginia, began in the early 1970s (Burkhead and Jenkins, 1991). The strength of the NFHR population was reflected by the invasion of this species into the upper Holston River proper. This species may repopulate tributaries that enter the Holston River proper (i.e. Big and Beech creeks). These tributaries support sensitive species of fish (i.e. *Notropis volucellus* and *Etheostoma camurum*), and freshwater mussels (i.e. *Villosa purpurea* and *Villosa trabilis*). The population in the MFHR was additional good news concerning *Cyprinella monacha*. For a complete geochronographic analysis of the spotfin chub, see Jenkins and Burkhead (1984, 1994).

Status: *Cyprinella monacha* is federally listed as Threatened. It is listed as endangered in Virginia (Jenkins and Burkhead, 1994) and Tennessee (Starnes and Etnier, 1980).

Cyprinella spiloptera (Cope 1868)

spotfin shiner

Leuciscus spilopterus Cope 1868a. St. Joseph River, Michigan.

Photogenis spilopterus Cope, 1869a: (379). Repeat description (Gilbert, 1971).

Cyprinella whipplii—Jordan and Evermann, 1896: (279). *Leuciscus spilopterus* treated as junior synonym of *Cyprinella whipplii*.

Notropis spilopterus spilopterus—Gibbs, 1957. Distribution of subspecies.

—Lee et al., 1980: (312). Type locality, distribution, habitat, and range.

Cyprinella spiloptera—Mayden, 1989. Revision.

Distribution: Menhinick (1991) did not report this fish from the Watuaga River in North Carolina. Jenkins and Burkhead (1994: 366) reported that the spotfin shiner was infrequently taken from the Holston River system of Virginia, but that it did occur in the NFHR, MFHR, and SFHR in Washington County, and the NFHR and MFHR in Smyth County. Etnier and Starnes (1993: 156) reported *Cyprinella spiloptera* throughout the Holston River system in Tennessee.

This species occurred in 97% of TVA collections taken in 1941 from tributaries and in the main channel of the Holston River prior to impoundment by Cherokee Dam (Table A9). After impoundment of the Holston River, 35 samples were taken from the Cherokee tailwaters at HRM 4, 17, 25, 33, 44, and 51, and the spotfin shiner was obtained at each of those six localities (Table A1). *Cyprinella spiloptera* was present in 10 of 14 collections (71%) from the main channel of the Holston River upstream from Cherokee Lake from HRM 113 through 142 (Table A10).

From the NFHR, *Cyprinella spiloptera* was collected in one 1989 sample out of 17 collections made from Hawkins and Sullivan counties, Tennessee, from 1954 through 1991 (Table B2). In Virginia, the spotfin shiner was collected in NFHR of Scott County, (Table B3) and from Washington County (Table B4), but was not detected in Smyth

County until the 1970s by the TVA (Table B5). Jenkins and Burkhead (1994: 366) reported that a large hiatus in the distribution of *Cyprinella spiloptera* from the mid-reach of the NFHR of Virginia was possibly due to the mercury pollution from Saltville.

In 1947 and 1949, R.M. Bailey made six preimpoundment fish collections on the SFHR in the vicinity of South Holston dam. Only one collection was in Virginia, and the other five were in Tennessee (Table C3, C4). A single catalogued specimen (UMMZ 157493) of *Cyprinella spiloptera* (65 mm SL) was obtained by Bailey from Washington County, Virginia, in 1947. This species appeared in South Holston Lake cove rotenone samples in the 1960s (Table F4). Two spotfin shiner series at UT (44.284 and 44.250) were obtained from TVA cove rotenone samples in 1961 and 1962, respectively. They were from Sullivan County, Tennessee, and probably came from South Holston Lake—where another voucher (TWRA 11.74) was obtained in 1984 by TWRA (Table H14). After impoundment, the spotfin shiner continued to be collected in the SFHR upstream from South Holston Lake in Washington County, Virginia, where Bailey had first observed it in 1947 (Table C4), but the fish was absent from 29 subsequent samples taken in the SFHR in Smyth County, Virginia (Table C5). Downstream from the reservoir, *Cyprinella spiloptera* was not observed in eight preimpoundment collections in 1930, 1947, and 1949, nor in 10 postimpoundment samples collected there from 1953 to 1993 (Table C3). Farther downstream, in the SFHR of Sullivan County, Tennessee, specimens were catalogued from Boone Lake (TWRA 11.35) in 1984, and from Fort Patrick Henry Lake (UT 44.11) in 1966. In 1990, additional spotfin shiners were catalogued from Horse Creek, a SFHR tributary (ANSP 168701, 168717). Both historical (1940 and 1952) and recent (1993) catalogued specimens are available from the MFHR of Smyth and Washington counties, Virginia.

From 33 collections made in the lotic Watauga River, *Cyprinella spiloptera* was only collected in Johnson County, Tennessee, upstream from Watauga Lake (Table E1).

The spotfin shiner was not identified from three preimpoundment (1888, 1837, 1947) collections in the Watauga River of Carter County, Tennessee, but appeared in a 1988 collection (Table E2). In Tennessee, Bailey collected some tributaries to the Watauga River in 1947 in a preimpoundment survey in the vicinity of Watauga dam. Those tributaries that Bailey collected were Roan and Little Doe creeks in Johnson County, and the Elk River in Carter County. *Cyprinella spiloptera* was not present in any of Bailey's three collections, but in 1977 specimens of the spotfin shiner were collected and catalogued from Roan Creek and the Elk River in Johnson and Carter counties, Tennessee, respectively (Table H14).

From TVA cove rotenone samples, this species was regularly collected in Cherokee Lake from 1949 through 1991 (Table F2) and in South Holston Lake (Table F4). It was rare in 31 samples from Boone Lake (Table F1) and 38 samples from Watauga Lake (Table F5), and was absent from eight samples in Fort Patrick Henry Lake (Table F3).

Cyprinella spiloptera, based on this survey, appeared to be frequently collected in the preimpoundment survey of the Holston River proper in 1941, but appeared less frequently in collections taken upstream in the preimpounded areas of the NFHR, MFHR, SFHR, and Watauga River. The distribution of the spotfin shiner was altered by impoundment in the Holston River system.

Remarks: The steelcolor shiner, *Cyprinella whipplei*, is a species similar to *Cyprinella spiloptera*. The steelcolor shiner was reported, but not catalogued from the Holston River system. Single specimens of *Cyprinella spiloptera* from the Holston River system that were identified as *Cyprinella whipplei* were located at two museums (UMMZ 226460 and UAIC 7922.19). All reports of *Cyprinella whipplei* from the Holston system should be considered suspect unless future voucher specimens can reverse this opinion. Etnier and Starnes (1993) and Jenkins and Burkhead (1994) do not report *Cyprinella whipplei* from the Holston River system of Tennessee or Virginia.

Cyprinus carpio Linnaeus 1758

common carp

Cyprinus carpio Linnaeus 1758. Europe.

—Jordan and Evermann, 1896: (201).

—Menhinick et al., 1974: (30). Not taken from Watauga River in North Carolina.

—Allen, 1980: (152). Dot distribution map.

Distribution: Menhinick (1991: 57) accepted a record of the carp from the Watauga River in North Carolina. Jenkins and Burkhead (1994: 274) found records of this fish from the NFHR, MFHR, and SFHR in Virginia. Etnier and Starnes (1993: 162) reported this species as occupying the entire Holston River system in Tennessee.

In the 1941 preimpoundment survey by TVA at the future site of Cherokee Lake, the common carp was catalogued from four tributaries (UMMZ 169551, 221598, 221647, 222437) to the Holston River (Table A8). On April 1, 1943, carp began a mass migration out of Cherokee Lake and were observed 90 miles upstream in the Watauga River by May 29, 1943; the carp then moved another 15 miles up the Doe River (Shields, 1944). In addition, carp were catalogued from Mossy Creek, a tributary to Cherokee Lake, from 1952 (CU 23283) and 1953 (CU 25538) collections. *Cyprinus carpio* was catalogued from the Holston River proper upstream from Cherokee Lake in 1965 (ANSP 110759).

The common carp was catalogued from the NFHR (Table B1), and the SFHR (Table C1). Carp appeared quickly and continuously in TVA cove rotenone samples of five TVA storage reservoirs in the Holston River system (Appendix F). *Cyprinus carpio* was identified from the MFHR of Virginia, upstream from South Holston Lake in Washington County during 1972 by N.M. Burkhead (Table D2), and from Smyth County during 1976 by R.E. Jenkins (Table D3). From the SFHR, upstream from South Holston Lake in Virginia, the carp was reported from Washington County, but not from 29 samples obtained in Smyth County (Table C5).

Erimystax cahni (Hubbs and Crowe 1956)

slender chub

Hybopsis cahni Hubbs and Crowe 1956. Powell River, three miles southeast of Harrogate at U.S. Highway 25E, Claiborne County, Tennessee.

—Jenkins et al., 1980: (182). Dot distribution map.

—Harris, 1986: (144-156). Systematics, distribution, and biology.

Erimystax cahni—Robins et al., 1991. Elevated subgenus *Erimystax* to genus.

Distribution: Jenkins and Burkhead (1994: 331-332) reported this species from two sites on the Powell River in Lee County, Virginia. Etnier and Starnes (1993: 165) defined the Tennessee distribution of this fish to include the Clinch, Powell, and Holston rivers. Etnier et al. (1979) reported that a single catalogued specimen (UMMZ 209536) of *Erimystax cahni* existed from the entire Holston River system. This specimen was collected by TVA in a preimpoundment survey made in 1941 in the future site of Cherokee Lake from the main channel of the Holston River proper at Bingham Island and Watermelon Island. No other specimens have been identified from the Holston River system.

Remarks: If this specimen had not been collected in 1941, the slender chub would have been considered endemic to the Powell and Clinch River systems (Etnier and Starnes, 1993: 164). The original distribution of this fish, its abundance, and life cycle in the Holston River will probably never be known.

Status: *Erimystax cahni* is listed federally as endangered, as threatened in Virginia, and as threatened in Tennessee. A recent survey prompted by the disappearance of this species from recent collections was made by N.M. Burkhead of all historic sites for this species and the results were negative. *Erimystax cahni* may be extinct (Burkhead, pers. comm.).

Erimystax dissimilis (Kirtland 1841)

streamline chub

Luxilus dissimilis Kirtland 1841.[Note: *in* Kirtland 1840]. Mahoning River and Lake Erie near Cleveland, Ohio. According to Harris (1986: 46), Kirtland realized that he was mistaken about the Lake Erie records of this species.

Hybopsis watauga Jordan and Evermann 1889 *in* Jordan, 1889a. Proc. U.S. Nat. Mus. [1888]: (355). Watauga River, Elizabethton, Tennessee; North Fork Holston River, Saltville, Virginia. Type: USNM 39929.

—Jordan, 1889b: (146). Rare in river channels.

Hybopsis dissimilis—Jordan and Evermann, 1896: (318).

—Menhinick et al., 1974: (30). No verified records from North Carolina. All North Carolina records that have been examined are *Hybopsis insignis*.

—Harris, 1980: (184). Dot distribution map.

—Harris, 1986: (20-61). Suggested return to the common name, spotted chub, following Kirtland. Systematics, distribution, and biology.

Erimystax dissimilis—Mayden, 1989. Revision.

Distribution: Jenkins and Burkhead (1994: 334) reported the streamline chub from the Clinch and Powell rivers, and from the NFHR and the MFHR in Virginia, but not the SFHR. In the 1941 TVA preimpoundment survey of the Holston River, *Erimystax dissimilis* was only taken from the main channel of the Holston River at Watermelon and Bingham islands (Table A9). The streamline chub does not occupy the Holston River downstream from Cherokee Dam (Table A1). Specimens of *Erimystax dissimilis* are catalogued from the main channel of the Holston River upstream from Cherokee Lake in 1990, 1991, and 1992 (Table A10).

From the NFHR, catalogued specimens are known from 1888 and 1928 in Smyth County, Virginia (Table B5). Catalogued specimens are known from Washington County,

Virginia, from 1976, 1977, 1988, 1992, and 1993 (Table B4); Scott County, Virginia, in 1967 and 1987 (Table B3); and from Hawkins and Sullivan counties, Tennessee, in 1963, 1968, 1989, and 1991 (Table B2).

In the SFHR, catalogued specimens are available from Sullivan County, Tennessee, collected by Bailey in 1947 (UMMZ 157562, 157593), but this fish was not reported again from 10 subsequent collections in the South Holston tailwaters from 1953 through 1993 (Table C3). In the SFHR, downstream from Kingsport, Tennessee, this species was detected in 1974 (ANSP 132184). This record probably represents the species moving upstream from the NFHR, and not downstream through the SFHR (Table C2). Upstream from South Holston Lake in the MFHR of Virginia, specimens of *Erimystax dissimilis* were collected sporadically from Smyth and Washington counties—where catalogued specimens were taken in 1961 and 1993 respectively (Table D2, D3). No records of the slender chub were located by this survey upstream from South Holston Lake in the SFHR of Virginia (Table C4, C5). Catalogued specimens from the Watauga River in Carter County, Tennessee, were collected in 1888 and 1937; but Bailey in 1947 did not locate this fish in his preimpoundment survey in the vicinity of Watauga dam (Table E2). The species has not been reported in the Watauga River since 1937 (Table E2, E3, E4).

Remarks: Impoundment has reduced available habitat of the streamline chub, but it appears to have refugia in the NFHR, the Holston River upstream from Cherokee reservoir, and the MFHR. If the tailwaters of the TVA storage reservoirs were restored to suitable habitat for this species, some of its former range could be repopulated. Cleaner water (i.e.: less industrial pollutants) in the Watauga River may allow this species to return to that stretch of river.

Erimystax insignis (Hubbs and Crowe 1956)

blotched chub

Hybopsis insignis Hubbs and Crowe 1956. Tennessee River at the head of Blood River Island, Calloway County, Kentucky.

—Harris, 1980: (188). Dot distribution map.

Hybopsis insignis eristigma—Harris, 1986: (75-83). Figure II-13 indicates Holston River population as this subspecies, but suggests that they may represent intergrades.

Erimystax insignis—Mayden, 1989. Revision.

Distribution: *Erimystax insignis* is a fish of the Blue Ridge physiographic province in the Holston River system. Within the Holston River system, it is confined to the SFHR and tributaries to the Watauga River (Menhinick, 1991; Etnier and Starnes, 1993; Jenkins and Burkhead, 1994).

Harris (1980) presented a dot distribution map showing populations of this fish in the SFHR on both sides of the Tennessee and Virginia shared border, as well as in a tributary to the Watauga River near North Carolina. Jenkins and Burkhead (1994: 336) reported the blotched chub from the Clinch and Powell rivers and the SFHR in Washington County, Virginia, but not in the NFHR or MFHR. This agrees well with the catalogued specimens found in this study. Catalogued specimens are housed at UMMZ from the SFHR of Sullivan County, Tennessee, from a preimpoundment survey in 1947, but blotched chubs were absent in 10 collections from the tailwaters of South Holston Dam from 1953 to the present (Table C3). *Erimystax insignis* was collected in 1970 and the 1980s from the SFHR in Washington County, Virginia (Table C4). In 1947 *Erimystax insignis eristigma* was collected from the Watauga River in two tributaries — Roan Creek in Johnson County, Tennessee (UMMZ 157433) and Elk River in Carter County, Tennessee (UMMZ 157415).

Remarks: *Erimystax insignis* avoids the Holston River proper, the NFHR, and the MFHR, where *Erimystax dissimilis* occurs. The two chubs are sympatric in the SFHR near the Tennessee/Virginia border, which is a transitional zone between cold water and cool water habitat, and high and low gradients. In tributaries to the Tennessee River system other than the Holston River system, these two species are sympatric in the Buffalo, Clinch, Duck, Elk, and Powell rivers (Harris, 1980, 1986). *Erimystax insignis* once lived in the SFHR and Watauga River in the vicinities of South Holston and Watauga dams. This species appears to be surviving in the SFHR upstream from South Holston Lake, but does not appear to be present upstream from Watauga Lake. In addition, it does not appear to have survived in the tailwaters of either of those reservoirs.

Hybopsis amblops (Rafinesque 1820)

bigeye chub

Rutilus amblops Rafinesque 1820a. Falls of the Ohio at Louisville, Kentucky.

Hybopsis gracilis Agassiz 1854. Huntsville, Alabama.

Ceratichthys hyalinus Cope 1868c. J. Acad. Natl. Sci. Phila., ser. 2, 6: 207-247, (226-227). Tributaries of Holston River. This species is abundant in mouths of creeks.

Nocomis amblops winchelli—Jordan, 1877a. In part, Tennessee drainage.

Hybopsis amblops Jordan, 1889b: (145-146). Rather common in all streams of the Holston River.

—Jordan and Evermann, 1896: (320).

—Fowler, 1924: (410). Holston River.

—Clemmer, 1971. Reviewed species.

—Clemmer, 1980: (181). Dot distribution map.

Notropis amblops—Robins et al., 1991. Recommended generic change.

Hybopsis amblops—Etnier and Starnes, 1993; and Jenkins and Burkhead, 1994 both rejected Robins et al. (1991) burial of *Hybopsis* into synonymy of *Notropis*.

Distribution: Etnier and Starnes (1993: 176) reported this species to be widespread in the Holston River in Tennessee. Jenkins and Burkhead (1994: 347) found this species to be widely distributed in the Tennessee drainage of Virginia.

Hybopsis amblops was collected in 27 of 30 preimpoundment samples in the 1941 survey in the vicinity of Cherokee Dam (Table A9). From 1965 through 1992, *Hybopsis amblops* was present in only four of 14 (29%) samples taken in the Holston River proper upstream from Cherokee Lake, but all four of those records were from 1990 through 1992 (Table A10), and were made from HRM 118 and 119, near the mouth of Beech and Big creeks—where specimens of *Hybopsis amblops* were collected and catalogued in 1990 (Table H19). *Hybopsis amblops* was collected only once in the Cherokee tailwaters from 1953 through 1993 (Table A1, A4).

Except for Bland County, Virginia, specimens of *Hybopsis amblops* are catalogued from the NFHR in all the counties that it drains—Smyth (1928 and 1967), Washington (1937-1993), and Scott (1967) counties, Virginia, and Hawkins and Sullivan (1989 and 1991) counties, Tennessee (Appendix B, Table H19). The NFHR in Washington County, Virginia, would be the section most likely perturbed by the mercury pollution emanating from Saltville near the Smyth/Washington county line, but 80% of the collectors that sampled that portion of the river from 1937 to 1993 located the bigeye chub there.

The bigeye chub was widespread in the SFHR of Virginia and Tennessee prior to impoundment (Table C1). From the upper SFHR in Smyth County, Virginia, specimens of *Hybopsis amblops* were collected in 1888 (Jordan, 1889a) and in the 1950s (Ross and Carico, 1963); but eight collectors making 14 subsequent samples did not relocate this species there (Table C5). Downstream in the SFHR, specimens were catalogued from 1947, 1965, 1974, and 1980 collections made in Washington County, Virginia (Table C4).

Looking farther downstream into Sullivan County, Tennessee, catalogued SFHR specimens of *Hybopsis amblops* are available from four of four localities that were collected in a 1947 preimpoundment survey (UMMZ 157510, 157536, 157560, 157596), but the bigeye chub was absent from the next 10 collections taken from the South Holston tailwaters (Table C3). From Virginia in the MFHR, specimens of bigeye chub were collected in both Smyth County from 1888 to 1986, and from Washington County from 1885 to 1993 (Table D1).

Hybopsis amblops was not collected from the Watauga River in North Carolina (Clemmer, 1980; Menhinick, 1991). Records examined in this study agree with that assessment (Table E4). This species was catalogued from Johnson County, Tennessee, in 1947 by Bailey (UMMZ 157474), and was reported from that location again in 1973 by Etnier (Table E3). In 1947 and 1977, *Hybopsis amblops* was catalogued from Roan Creek, a tributary to the Johnson County section of the Watauga River (Table H19). *Hybopsis amblops* was collected from the Watauga River in Carter County, Tennessee, in three preimpoundment collections in 1888, 1937, and 1947, but was not present in 10 later collections from 1953 through 1991 (Table E2). Specimens were catalogued (Table H19) from two tributaries to that portion of the Watauga River—Doe River (1953, 1984, and 1988) and Elk River (1947 and 1978).

Remarks: This species was apparently common in the mouths of rivers and creeks of the NFHR (Cope, 1868; Jordan, 1891). It was common in the mouths of tributaries to the Holston River proper in the TVA 1941 preimpoundment survey in the vicinity of Cherokee Lake, and those populations were extirpated by impoundment.

Luxilus chrysocephalus Rafinesque 1820

striped shiner

Luxilus chrysocephalus Rafinesque 1820a. "Kentucky".*Hypsilepis cornutus frontalis*—Cope 1868b: (158-159). Holston River, Virginia.

Abundant.

Hypsilepis cornutus—Cope 1868c: (229). In the Holston common in all streams .*Hybopsis lacertosus* Cope 1868c: (232). Four specimens from Bear Creek, MFHR, Virginia. Types ANSP: 2835-2839, according to Gilbert (1964: 160-161).*Hydrophlox lacertosus*—Jordan and Brayton, 1878:(64, 84-85). Holston River.*Notropis lacertosus*—Jordan, 1889b: (144). Seems to be rare in Holston.*Notropis megalops* (Cope)—Jordan, 1889b: (144). Common in larger streams.*Notropis cornutus*—Jordan and Evermann, 1896: (282). *Luxilus chrysocephalus* treated as a junior synonym of *Notropis cornutus*.*Notropis lacertosus*—Jordan and Evermann, 1896: (284). Headwaters Tennessee River.*Notropis cornutus*—Feeman, 1980. From the Holston River in 1973.*Notropis chrysocephalus chrysocephalus*—Gilbert, 1964. Reviewed species.

—Gilbert 1980: (256). Dot distribution map.

—Feeman, 1986. Common throughout the NFHR

Luxilus chrysocephalus—Robins et al., 1991. Elevated subgenus *Luxilus* to generic status.

Distribution: This species is a ubiquitous fish, found practically everywhere in the Holston River system. According to Gilbert (1980), Menhinick et al. (1974), and Menhinick (1991), *Luxilus chrysocephalus* does not occur in the North Carolina portion of the Watauga River, but does occur just downstream of the border in Johnson County, Tennessee.

Luxilus coccogenis (Cope 1868)

warpaint shiner

Leuciscus coccogenis Cope in Günther 1868a. Catalogue of the Fishes in the British Museum 7: 1-512 (253). Holston River in Virginia.

Hypsilepis coccogenis Cope 1868b: (160). Abundant in rapid creeks of Holston.

—Cope, 1868c: (229). One of most abundant species in Holston.

Notropis coccogenis—Jordan, 1889b: (145). Everywhere, very common; the most abundant of the larger minnows in the Holston.

—Jordan and Evermann 1896: (284). Designated USNM 36849 (E.D. Cope, September, 1867) as "type" from Holston River in North Carolina.

Notropis coccogenis—Gilbert, 1964. Designated Lectotype: USNM 36849, Considered North Carolina erroneous data; substituted Virginia, into the type locality.

—Gilbert, 1978: (37). Lectotype: USNM 36849 (E.D. Cope, September, 1867). Lectoparatype: MCZ 35653; BMNH 1868.1.10.3; ANSP 3561-3650; MNHN 4852. Remainder of ANSP syntypic series (ANSP 3651-3660) mixture of this and four other species.

—Gilbert, 1980: (257). Dot distribution map.

Luxilus coccogenis—Mayden 1989. Revision.

Distribution: *Luxilus coccogenis* was collected in 21% of the samples in 1941 in the vicinity of Cherokee dam (Table A9), in the Cherokee inflow (Table A10), but not from the Cherokee tailwaters (Table A1). It was collected in the NFHR, SFHR, MFHR, and Watauga River (Appendices B-E). *Luxilus coccogenis* was common in the preimpounded water in the vicinity of South Holston (Table C3) and Watauga (Table E2) dams. It survived in those two reservoirs (Table F4, F5), but has since disappeared from their tailwaters. It was not present in cove rotenone samples of Boone (Table F1), Cherokee (Table F2), or Fort Patrick Henry (Table F3) reservoirs.

Lythrurus ardens (Cope 1868)

rosefin shiner

Leuciscus ardens Cope 1868a. Headwaters of Roanoke River, Virginia.

Hypsilepis ardens Cope 1868c. Repeated above description.

Notropis umbratilis ardens—Jordan and Evermann, 1896: (301).

Notropis ardens —Smith-Vaniz, 1968: (42).

—Snelson, 1980: (228). Dot distribution map.

Lythrurus ardens Mayden, 1989. Revision.

Notropis ardens fasciolaris—Snelson, 1990. Subspecies in Tennessee drainage.

Distribution: Snelson (1980) reported the rosefin shiner from the upper Tennessee River drainage. Jenkins and Burkhead (1994: 385) indicated localities for the rosefin shiner on the NFHR of Virginia, near the Tennessee state line (in agreement with Snelson). Etnier and Starnes (1993: 188) accepted records of this species from the Holston River proper in the vicinity of Cherokee reservoir and tributaries to that portion of the river. Menhinick (1991: 93) did not report *Lythrurus ardens* from the Watauga River in North Carolina.

Lythrurus ardens was catalogued from Holston River tributary collections taken downstream from the confluence of the NFHR and SFHR (Table H22). The rosefin shiner occurred in 17% of preimpoundment samples made by the TVA in 1941 (Table A9) from Dodsons Creek, German Creek (Briar Fork and Ray Creek), Honeycutt Creek, and Poor Valley Creek (Table H22). In 1990, additional populations were discovered near HRM 111 in two Holston River tributaries, Big and Beech creeks (Table H22). Sixteen juveniles were taken in Possum Creek, a tributary to the NFHR in Scott County, Virginia, on May 13, 1967, by R.E. Jenkins (Feeman, 1986). *Lythrurus ardens* was not located in the SFHR or any of its tributaries (Table C1).

Macrhybopsis aestivalis (Girard 1856)

speckled chub

Gobio aestivalis Girard 1856. Rio San Juan, near Cadereita, Nuevo Leon.

Hybopsis aestivalis—Jordan and Evermann, 1896: (316).

Macrhybopsis aestivalis—Jordan et al., 1930.

Hybopsis aestivalis—Smith-Vaniz, 1968.

—Wallace, 1980: (180). Systematics, distribution, and biology.

Extrarius aestivalis—Mayden, 1989.

Macrhybopsis aestivalis—Robins et al., 1991.

Distribution: Menhinick (1991: 67) did not report *Macrhybopsis aestivalis* from the Holston River system in North Carolina. Jenkins and Burkhead (1994: 38-39) did not list this species among the Cyprinidae known from Virginia. Etnier and Starnes (1993: 193) plotted the speckled chub from the Cherokee tailwaters. This distribution agrees with Wallace (1980). Specimens of *Macrhybopsis aestivalis* were collected between HRM 4-6 in 1967 (UT 44.180), 1969, and 1992 (UT 44.6022). The TVA reported the speckled chub from HRM 25 in 1992 on their field collection sheets.

The speckled chub was not located by the TVA in their 1941 preimpoundment survey upstream from Cherokee Dam from HRM 52.3 to 111, but only one of those preimpoundment TVA samples was from the main channel of the Holston River, where this species would likely occur (Table A9). *Macrhybopsis aestivalis* was not reported upstream from Cherokee Dam, based on this survey (Appendices A-F).

Remarks: In 1994, the author accompanied TVA on a collecting trip in the French Broad River a few miles upstream from the mouth of the Holston River. More than one-hundred specimens of *Macrhybopsis aestivalis* were taken in one seine haul over a shallow gravel bar. According to R.K. Wallace (1980), *Macrhybopsis aestivalis* lives in large, medium gradient streams over fine gravel and/or sand.

Macrhybopsis storeriana (Kirtland 1845)

silver chub

Rutilus storerianus Kirtland 1842. *Nomen nudum* (Boschung, 1992).

Leuciscus storerianus Kirtland 1845a: (199-200). May have been first complete description (Boschung, 1992).

—Kirtland 1845b: (30). Original description (Boschung, 1992). Ohio River.

Hybopsis storerianus—Jordan and Evermann, 1896: (321).

Hybopsis storeriana—Smith-Vaniz, 1968.

—Gilbert, 1980: (194). Dot distribution map.

Macrhybopsis storeriana—Mayden, 1989. Revision.

Distribution: The silver chub was not reported by Menhinick (1991) from the Watauga River in North Carolina, nor by Jenkins and Burkhead (1994: 38-39) from Virginia. Etnier and Starnes (1993: 196) indicated that from the Holston River system in Tennessee the silver chub was only known from the lower Cherokee tailwaters. This agreed with the distribution portrayed by Gilbert (1980).

Macrhybopsis storeriana was collected in 6% of the samples taken downstream from Cherokee Dam (Table A1). On August 1, 1967, the silver chub was collected from the Cherokee tailwaters in Knox County, Tennessee, but that specimen was not preserved (Table A2). Based on this survey, there are no catalogued specimens of the silver chub from the Holston River system (Table H25). A silver chub was catalogued from a Tennessee River collection made by TVA at the confluence of the French Broad and Holston rivers on November 19, 1993; and another individual was collected from Fort Loudoun reservoir in the vicinity of Knoxville on November 17, 1984—both specimens were combined under UT 44.3150 (Table H25). In 1974, *Macrhybopsis storeriana* was reported by TVA 1.3 miles downstream from Cherokee Dam (Hill and Brown, 1980: 18).

Nocomis micropogon (Cope 1865)

river chub

Ceraticthys micropogon Cope 1865a. Conestoga River, tributary of the Susquehanna River. Lancaster, Pennsylvania.

Ceraticthys biguttatus—Cope, 1868c: (226). Abundant in Holston.

Hybopsis kentuckiensis—Jordan, 1889b: (146). Common in Holston.

—Jordan and Evermann, 1896: (322-323). Treated *Ceraticthys micropogon* as a junior synonym of *Hybopsis kentuckiensis*.

—Fowler, 1924: (411). In Holston River.

Nocomis micropogon—Lachner and Jenkins, 1967. Distribution.

—Jenkins and Lachner, 1980: (215-216). Dot distribution map.

Distribution: Jenkins and Burkhead (1994: 326) reported this species throughout the NFHR, SFHR, and MFHR in Virginia. Menhinick (1991: 71) reported this species from the Watauga River in North Carolina.

Nocomis micropogon was common in fish collections of the Holston River system. The river chub was collected in 27 of 30 preimpoundment population surveys made by TVA in the vicinity of Cherokee Dam in 1941 (Table A9). River chubs were collected in Cherokee Lake by TVA cove rotenone crews in 1949 and in the 1980s (Table F2). *Nocomis micropogon* was collected from the main channel downstream from Cherokee Dam, but all collection records of the river chub in the Cherokee tailwaters are at least 27 miles downstream from the dam (Table A1). The river chub occurred in 11 of 14 collections made upstream from Cherokee Lake (Table A10). It was common in collections upstream in the NFHR of Tennessee and Virginia (Table B).

In Virginia, *Nocomis micropogon* was collected from the upper SFHR of Smyth County in 1888 (Jordan, 1889b) and in the 1950s (Table C5), and from the lower SFHR of Washington County, where it was well represented in collections (Table C4). Ross and

Carico (1963) reported river chubs collected on September 1, 1951, from South Holston reservoir, but TVA did not detect them in cove rotenone, electrofishing, or gill-netting samples of South Holston reservoir in Tennessee from 1951 through 1991 (Table F4, G3). *Nocomis micropogon* was collected in the SFHR in 1947 and 1949, prior to impoundment, and in the South Holston tailwaters soon after impoundment in 1953 (Table C3). However, seven collections since 1953 did not reveal *Nocomis micropogon* from the South Holston tailwaters (Table C3). Cove rotenone samples did not include river chubs from either Boone (Table F1), or Fort Patrick Henry (Table F3) reservoirs in Tennessee. In the vicinity of Kingsport, Tennessee, ANSP has monitored the SFHR in 1965, 1974, 1980, and 1990 (Table C2). *Nocomis micropogon* was absent only from the most recent 1990 ANSP collection. At the same site, J.L. Wilson also failed to capture a river chub in 1991 (Table C2). These two negative collections in the 1990s in the vicinity of Kingsport, certainly deserve notation, especially based on its prior frequency of collection at that locality and its history of recent extirpation from other portions of the SFHR.

Nocomis micropogon was present in four early collections made in 1888, 1937, 1947, and 1953 from the Watauga River in Carter County, Tennessee, but was absent from 10 collections made there after 1953 in the Watauga tailwaters (Table E2). In the Watauga River in Johnson County, upstream from Watauga Lake, there is a refugium for *Nocomis micropogon* where it was collected in four out of four collections in 1947, 1973, and 1978 (Table E3). River chubs were collected regularly in the Watauga River of Watauga County, North Carolina (Table E4). *Nocomis micropogon* was collected in cove rotenone samples of Watauga Lake in 1949 and 1971 (Table F5). *Nocomis micropogon* lives in tributaries to Watauga Lake, which may explain its presence in Watauga Lake (Table H25). **Remarks:** *Nocomis micropogon* was common in fish collections under certain conditions, but not in tailwaters. The river chub has been impacted by Cherokee, South Holston, and Watauga dams, but may be collected in reservoirs (Appendix F).

Notemigonus crysoleucas (Mitchill 1814)

golden shiner

Cyprinus crysoleucas Mitchill 1814. New York.

Notemigonus crysoleucas—Jordan and Brayton, 1878.

Abramis crysoleucas—Jordan and Evermann, 1896: (250).

Notemigonus crysoleucas—Bailey et al., 1954: (123).

—Lee, 1980: (219). Dot distribution map.

Distribution: In Virginia, Jenkins and Burkhead (1994: 282) reported *Notemigonus crysoleucas* from the SFHR. From the Tennessee portion of the Holston River system, Etnier and Starnes (1993: 200) reported the golden shiner from Cherokee reservoir, the SFHR, and Watauga River.

The golden shiner was not collected by TVA in 1941 near Cherokee Dam (Table A9). Specimens of the golden shiner were catalogued from tributaries to the main channel Holston River by TWRA — from Flat Creek (Knox County, Tennessee) in 1986 and from Poor Valley Creek (Hawkins County, Tennessee) in 1987 (Table H26). It was collected in cove rotenone samples of Cherokee Lake in the 1960s and 1970s; but was not collected in 36 samples downstream (Table A1), or 14 samples upstream from Cherokee Lake (Table A10) in the Holston River.

The golden shiner was collected from Boone Lake in 1982 and 1983 (Table F1), South Holston Lake in the 1970s (Table F4), and Watauga Lake in 1970s and 1980s (Table F5). *Notemigonus crysoleucas* was catalogued from the MFHR (Smyth County, Virginia) in 1993 (Table H26), and from the SFHR in Smyth County, Virginia (Table C5), but not in the Watauga River of North Carolina (Table E4).

Remarks: This species has been and continues to be widely introduced throughout the United States as a bait fish. It lives in lakes, ponds, streams, and rivers (Lee, 1980).

Notropis ariommus (Cope 1868)

popeye shiner

Photogenis ariommus Cope 1868b. White River, near Indianapolis, Marion County, Indiana.

Notropis ariommus—Jordan, 1889b: (145). Taken in Watauga River.

—Jordan and Evermann, 1896: (290).

Notropis ariommus—Gilbert, 1969. Description, systematics, and distribution.

—Gilbert, 1980: (229). Dot distribution map.

—Feeman, 1986. Common in the lower NFHR.

Distribution: *Notropis ariommus* was reported in Virginia from the NFHR (Jenkins and Burkhead, 1994: 407); in Tennessee from the Holston River upstream from Cherokee reservoir, the NFHR, and Watauga River (Etnier and Starnes, 1993: 209); but not from the Watauga River in North Carolina (Menhinick, 1991).

In 1941, TVA collected *Notropis ariommus* from the mouths of Poor Valley Creek and Robinson (=Robertson) Creek (Etnier et al., 1979). In 1992, the popeye shiner was collected from the main channel of the Holston River (HRM 118) upstream from Cherokee Lake (Table H27).

Notropis ariommus was collected in Tennessee from the NFHR of Hawkins and Sullivan counties (Table B2); and in Virginia from the NFHR of Scott (Table B3), Washington (Table B4), and Smyth (Table B5) counties. Feeman (1986) reported that *Notropis ariommus* was more commonly collected downstream in the NFHR, and never upstream from NFHR mi 91.4. Feeman (1980) reported *Notropis ariommus* from the MFHR, but C.F. Saylor (pers. comm., 1992) did not accept that record. In the 1950s, TVA reported a popeye shiner from cove rotenone samples of South Holston reservoir in Tennessee (Table F4). No other records of *Notropis ariommus* from the SFHR were located.

Notropis ariommus was collected in the Watauga River of Carter County, Tennessee, in 1888 (Jordan, 1889b; Gilbert, 1969; Table H27). This species has not been reported from the Watauga River since then, based on the data collected for this report (Table E2).

Remarks: Gilbert (1969, 1980) reported that the popeye shiner disappeared from fish collections in North America from 1939 to 1969. This species lives in relatively clear large creeks and small rivers, and is usually associated with gravel substrate (Gilbert, 1969, 1980; Burkhead and Jenkins, 1991; Jenkins and Burkhead, 1994).

Status: Recommended for special concern status in Virginia by Jenkins and Musick (1979), Burkhead and Jenkins (1991), and Jenkins and Burkhead (1994).

Notropis atherinoides Rafinesque 1818

emerald shiner

Notropis atherinoides Rafinesque 1818a. "Lake Erie".

—Jordan and Evermann, 1896: (293).

Notropis atherinoides atherinoides—Fowler, 1945. From Holston River.

Notropis atherinoides—Gilbert and Burgess, 1980: (231-232). Range.

Distribution: Menhinick (1991: 95) did not report *Notropis atherinoides* from the Watauga River of North Carolina. In Virginia, Jenkins and Burkhead (1994: 398, 400) reported the emerald shiner in the Clinch and Powell rivers, but not the Holston. In Tennessee, Etnier and Starnes (1993: 211) reported *N. atherinoides* from Cherokee, Boone, South Holston, and Watauga reservoirs, and upstream from Cherokee Lake in the Holston River proper.

Based on this survey, *Notropis atherinoides* was collected at HRM 4-6 (Table A1), and in the Tennessee River at the mouth of the Holston River. The only catalogued specimens located from the Holston River system in this survey were collected downstream

from Cherokee Dam (Table H28).

Notropis atherinoides was reported from the NFHR and MFHR by Jordan (1889b), but those specimens were redetermined. The NFHR specimens were redetermined as *N. photogenis* by Jenkins and Burkhead (1994). C.R. Gilbert redetermined some of Jordan's MFHR specimens as *N. photogenis* (UMMZ 187283) and R.E. Jenkins (in litt.) identified another as *N. rubellus* (UMMZ 192575). Jordan and Evermann (1896: 293, 295) did not recognize either *N. photogenis* or *N. rubellus* from the Holston.

Notropis atherinoides was reported from Cherokee (Table F2), Boone (Table F1), and Watauga (Table F5) reservoirs from TVA cove rotenone samples; but without voucher specimens *N. atherinoides* cannot be confirmed upstream from Cherokee Dam

Status: Recommended for threatened status in Virginia by Burkhead and Jenkins (1991) and Jenkins and Burkhead (1994), referring to Clinch and Powell river populations, since this fish does not appear to be in the Holston River in Virginia.

Notropis leuciodus (Cope 1868)

Tennessee shiner

Photogenis leuciodus Cope 1868b. Proc. Acad. Nat. Sci. Phila. (1867) 19:156-66 (165). Tributaries of Holston River. Compared to *Photogenis telescopus* (= *Notropis telescopus*) this is a rare fish. Numerous specimens in the Museum Academy.

—Cope, 1868c: (229). From Holston River near Saltville.

Notropis leuciodus—Jordan, 1889b: (144). Very common.

—Jordan and Evermann, 1896: (291).

—Gilbert, 1978: (54). Reports Lectotypes: ANSP 2336. Lectoparatypes: ANSP 2337-2358; MCZ 25161.

—Gilbert and Burgess, 1980: (281). Dot distribution map.

Distribution: Menhinick (1991: 81) reported the Tennessee shiner from the Watauga River of North Carolina. Jenkins and Burkhead (1994: 391) reported *Notropis leuciodus* from the NFHR, SFHR, and MFHR in Virginia. From Tennessee, Etnier and Starnes (1993) reported this fish upstream from Cherokee reservoir, but indicated no records downstream from Cherokee Dam in the Holston River system.

Notropis leuciodus was catalogued from the Holston River upstream from Cherokee Lake from 1987 through 1992 (Table A10, H29). Big Creek and Beech Creek, two tributaries entering the Holston River at HRM 111, also supported populations of the Tennessee shiner (Table H29).

Catalogued collections from the NFHR document the presence of *Notropis leuciodus* in Smyth (1888 - 1993); Washington (1937 - 1992); and Scott (1987) counties, Virginia; and in Hawkins and Sullivan (1963 - 1991) counties, Tennessee (Table H29). The Tennessee shiner also enters tributaries to the NFHR such as Laurel Creek and Big Moccasin Creek (Table H29).

Notropis leuciodus was collected in Tennessee from the SFHR in the vicinity of South Holston Dam in preimpoundment surveys, but has been absent from 10 collections made in the tailwaters from 1953 through 1993 (Table C3). In Virginia, upstream from South Holston Lake, *Notropis leuciodus* was collected from the SFHR from 1888 through the 1950s (Table C4, C5); and from the MFHR from 1888 through 1993 (Table H29).

From the Watauga River, the Tennessee shiner was collected in North Carolina (Table E4), and in Tennessee from Johnson (Table E3) and Carter (Table E2) counties. *Notropis leuciodus* was collected in two of three preimpoundment collections in the vicinity of Watauga Dam, but was absent from collections of the tailwaters from 1953 to 1991 (Table E2). *Notropis leuciodus* was catalogued from tributaries to the Watauga River (Table H29) — Cove Creek, Doe Creek, Roan Creek, Doe River, and the Elk River.

Notropis photogenis (Cope 1865)

silver shiner

Squalius photogenis Cope 1865a. Youghiogheny River, Pennsylvania.*Notropis atherinoides*—Jordan, 1889b: (145). Misidentification. Abundant in quiet places in river channels.*Notropis photogenis*—Jordan and Evermann, 1896: (295-296).

—Gilbert, 1971. Discusses complicated nomenclatural history of this species.

—Gilbert, 1980: (295). Dot distribution map.

Distribution:

Menhinick (1991: 95) recorded the silver shiner from the Watauga River in North Carolina. Jenkins and Burkhead (1994: 402) reported *Notropis photogenis* from the NFHR, SFHR, and MFHR in Virginia. Etnier and Starnes (1993: 220) plotted this species in the Holston River system of Tennessee, upstream from Cherokee Lake.

In 1941, *Notropis photogenis* was absent from 29 collections in the tributaries to the Holston River proper, but was present in the main channel of the Holston River (Table A9). *Notropis photogenis* was not collected in the Holston River system downstream from Cherokee Dam in 36 samples (Table A1), but was catalogued from collections upstream from Cherokee Lake in the main channel of the Holston River (Table A10). In the 1970s TVA reported the "emerald shiner" (= *Notropis atherinoides*) from Cherokee Lake in cove rotenone samples made in the 1970s, but the "silver shiner" (= *Notropis photogenis*) was not reported. In the 1980s, the silver and not the emerald shiner was reported from Cherokee Lake (Table F2). These reservoir specimens were not located, and their identity is in doubt. Until additional specimens are seen from Cherokee Lake it will be difficult to determine which species occurs there.

In 1888, Jordan collected this species (see account under *Notropis atherinoides*) in the NFHR in Smyth County, Virginia; but did not recognize it. Catalogued specimens of

Notropis photogenis are known from the NFHR in Smyth (1958 and 1967), Washington (1988), and Scott (1987) counties of Virginia; and from Hawkins and Sullivan (1989 and 1991) counties of Tennessee (Appendix B).

Catalogued specimens of the silver shiner were taken from the SFHR in Washington County, Virginia; and from Sullivan County, Tennessee, in 1947 in the vicinity of South Holston Dam (Table H30). It was later collected by TGFC in 1953 in the South Holston tailwaters (Table C3); but was not collected in seven additional collections from those tailwaters since 1953. In Virginia, specimens from the MFHR are catalogued (Table H30) from Washington County in 1888 and 1993; specimens from Smyth County were taken in the 1950s through 1986, with catalogued specimens retained from 1961.

In 1888, *Notropis photogenis* was collected from the Watauga River in Carter County, Tennessee, but was absent from six lotic collections made there until it was relocated 100 years later in 1988 (Table E2). The "emerald shiner" (= *Notropis atherinoides*) was reported from Boone and Watauga reservoirs on the Watauga River in the 1970s and early 1980s, respectively by TVA (Table F1, F5) — while the silver shiner was not reported by them even though specimens of *Notropis photogenis* were catalogued from Watauga Lake in 1949, 1950, and 1986 (Table H30) and voucher specimens of the emerald shiner are lacking. The silver shiner was catalogued from the Watauga River of Johnson County, Tennessee, upstream from Watauga Lake (Table H30), but was not reported from 14 collections in the Watauga River of North Carolina (Table E4).

Remarks: In Virginia, the silver shiner was found in the NFHR, SFHR, and MFHR, but not in their tributaries (Jenkins and Burkhead, 1994: 402). It was not found in either Cherokee or South Holston tailwaters, but was known from both free-flowing reaches prior to impoundment. Its presence in the 1988 survey of the Watauga tailwaters may represent a response to improved water conditions due to water quality restrictions enforced against rayon manufacturers near Elizabethton in the early 1980s.

Notropis rubellus (Agassiz 1850)

rosyface shiner

Alburnus rubellus Agassiz 1850. Lake Superior, at Sault Ste. Marie, either Michigan or Ontario.

Alburnellus micropteryx Cope 1868c: (233). Holston River, Virginia.

Notropis atherinoides—Jordan, 1889b: (145). Misidentification: UMMZ 192575.

Notropis atherinoides—Jordan and Evermann, 1896: (293). *Alburnops rubellus* treated as a junior synonym of *Notropis atherinoides*.

Notropis micropteryx—Jordan and Evermann, 1896: (296-297).

Notropis rubellus micropteryx—Smith-Vaniz, 1968: (49).

—Gilbert, 1978: (61). Reported Lectotype: ANSP 2842. Lectoparatype: ANSP 2843. Designated by Fowler (1910).

Notropis rubellus—Gilbert and Burgess, 1980: (302). Dot distribution map.

Distribution: Menhinick (1991: 95) did not report the rosyface shiner from the Watauga River in North Carolina. In Virginia, Jenkins and Burkhead (1994: 388) reported the rosyface shiner from the NFHR and the MFHR. Etnier and Starnes (1993: 221) reported *Notropis rubellus* from the Tennessee portion of the Holston River system upstream from Cherokee Lake, except for one locality in the Cherokee tailwaters.

In 1941, *Notropis rubellus* had a frequency of occurrence of 57% in 30 collections (Table A9). In the Cherokee tailwaters from 1953 through 1993, the rosyface shiner was present in two of 36 collections (Table A1). It was reported from a TVA cove rotenone sample collected in Cherokee Lake during the 1970s (Table F2). Upstream from Cherokee Lake in lotic waters from HRM 118 to 142, *Notropis rubellus* was observed in eight of 14 samples (Table A10).

Notropis rubellus was well represented from NFHR collections through space and time (Appendix B). Feeman (1986: 7) called this fish the "most abundant" in NFHR, but

absent from tributaries. From the MFHR, *Notropis rubellus* was present (catalogued from both Smyth and Washington counties, Virginia), but not encountered as frequently as in collections from the NFHR (Table D2, D3, H31). The rosyface shiner was collected by Jordan in 1888 in the MFHR, but was misidentified as *Notropis atherinoides* (Jenkins, in litt.). *Notropis rubellus* was present in two of three samples from 1885 through 1937 in the lower MFHR of Washington County, Virginia, but was not present in 16 samples taken there after 1937 (Table D2). In the upper MFHR of Smyth County, Virginia, *Notropis rubellus* appeared in collections in 1961, and was later taken by R.E. Jenkins in the 1970s, N.M. Burkhead in the 1980s, and the TVA in 1986 (Table D3). In 1993, four collections from the MFHR in Smyth County, Virginia, did not produce any rosyface shiners although it was a species targeted for collection (Table D3).

Based on UMMZ catalogued specimens from three samples taken in 1947 in the SFHR of Tennessee (Table H31), Bailey collected *Notropis rubellus* in all three attempts; but when he returned to collect there in 1949 it was not located. This species was not collected in the SFHR downstream from South Holston reservoir in Carter County, Tennessee, after impoundment (Table C3). From the SFHR at Kingsport, Sullivan County, Tennessee, *Notropis rubellus* was present in ANSP sampling trips made in 1974 and 1980, but was absent from collections made by ANSP in 1990, and by J.L. Wilson in 1989 and 1991 (Table C2). In Virginia, the only report of this species from the SFHR came from Ross and Carico (1963) in Smyth County (Table C4, C5). The only record from the Watauga River was from a preimpoundment collection made by R.M. Bailey in 1947 in Carter County, Tennessee (Table E1, E2).

Remarks: The range of this species was reduced by impoundment in the Holston River system. Even the lotic waters downstream from the lentic reservoirs do not support this species (Table A1, C3, E2). Its stronghold is in the NFHR.

Notropis rubricroceus (Cope 1868)

saffron shiner

Hybopsis rubricroceus Cope 1868c. J. Acad. Nat. Sci. Phila., ser. 2, 6:207-247 (231). Tumbling Creek of NFHR, Virginia.

Notropis rubricroceus—Jordan, 1889b: (145). Outnumbering all other species at Marion and Holstein Mills. Rare in the rivers.

—Fowler, 1910. Lectotype: ANSP 2907. Lectoparatypes: ANSP 2908-2918.

—Gilbert, 1978: (75-76). Reports Lectotype and Lectoparatypes.

—Gilbert, 1980: (303). Dot distribution map.

Distribution: *Notropis rubricroceus* was not reported from the Watauga River in North Carolina (Menhinick, 1991: 83), but was reported from the NFHR, MFHR, and SFHR in Virginia (Jenkins and Burkhead, 1994: 394). *Notropis rubricroceus* was collected from the Holston River system in Tennessee (Etnier and Starnes, 1993: 223), but was not reported downstream from HRM 118 (Table A1, A8).

In the NFHR, *Notropis rubricroceus* was collected in the upper reaches of Washington, Smyth, and Bland counties, Virginia (Table B4, B5, B6), but not downstream (Table B2, B3). From the SFHR, *Notropis rubricroceus* was collected in Smyth and Washington counties, Virginia (Table C4, C5), and was found downstream in the vicinity of South Holston Dam in 1947. It was not reported from the tailwaters of South Holston Dam (Table C3). In the MFHR of Virginia (Table D2, D3), the saffron shiner was collected upstream in Smyth County, and in Washington County close to the Smyth County border (Jenkins and Burkhead, 1994: 394). *Notropis rubricroceus* was absent from the Watauga River, but was collected in its tributaries (Table H32).

Remarks: Gilbert (1980) said that this species occupies small, clear, cool, high gradient, headwater streams with a gravel-rubble bottom, and is restricted to montane regions more than other species of *Notropis*.

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APPENDICES

APPENDIX A

Table A1. Collection summary from the tailwaters of Cherokee Dam. Seventy-three nominal fish species collected from the Holston River proper by Holston River mile (HRM) from 35+ collections. The number of samples (#) per river mile are listed from HRM 4 in 1967, 1968, 1969, 1970, 1977, 1980, 1985, 1989, 1991, 1992, and 1993; HRM 17 in 1978, 1983, and 1991; HRM 25 in 1974, 1989, 1991, and 1993; HRM 33 in 1987, 1989, 1991, and 1993; HRM 44 in 1953, 1989, 1991, and 1993; and HRM 51 in 1952, 1953, 1974, and 1989. C= catalogued specimens; x= species reported.

Scientific Name	HRM 4 (12+)	HRM 17 (4)	HRM 25 (5)	HRM 33 (4)	HRM 44 (5)	HRM 51 (5)
<i>Polyodon spathula</i>						x
<i>Lepisosteus osseus</i>	x		x	x	x	x
<i>Hiodon tergisus</i>	C	C	x		x	x
<i>Alosa chrysochloris</i>	x				x	x
<i>Alosa pseudoharengus</i>						x
<i>Dorosoma cepedianum</i>	x		x	x	x	C
<i>Dorosoma petenense</i>	x		x	x	x	x
<i>Camptostoma anomalum</i>	x	x	C	x	x	
<i>Carassius auratus</i>	x					x
<i>Cyprinella galactura</i>	C					
<i>Cyprinella spiloptera</i>	x	x	C	C	x	C
<i>Cyprinus carpio</i>	x		x	x	x	x
<i>Hybopsis amblops</i>			C			
<i>Luxilus chrysocephalus</i>			C			
<i>Luxilus coccogenis</i>	x					
<i>Macrhybopsis aestivalis</i>	C		x			
<i>Macrhybopsis storeriana</i>	x					x
<i>Nocomis micropogon</i>	C	x	x		x	
<i>Notemigonus crysoleucas</i>						x
<i>Notropis atherinoides</i>	C					

Scientific Name	HRM 4 (12+)	HRM 17 (4)	HRM 25 (5)	HRM 33 (4)	HRM 44 (5)	HRM 51 (5)
<i>Notropis rubellus</i>	C					
<i>Notropis stramineus</i>	C					
<i>Notropis volucellus</i>		x				
<i>Pimephales notatus</i>	x		x	x		x
<i>Pimephales promelas</i>	x			x		
<i>Pimephales vigilax</i>	x			x		
<i>Rhinichthys atratulus</i>						C
<i>Carpiodes carpio</i>	x					x
<i>Carpiodes cyprinus</i>						x
<i>Catostomus commersoni</i>					x	
<i>Cycleptus elongatus</i>						x
<i>Hypentelium nigricans</i>	x		C	C	x	x
<i>Ictiobus bubalus</i>	x		x	x	x	x
<i>Ictiobus niger</i>			x	x	x	
<i>Moxostoma anisurum</i>			C		x	x
<i>Moxostoma carinatum</i>	x		x		x	x
<i>Moxostoma duquesnei</i>	x		x			
<i>Moxostoma erythrurum</i>	x		x	x		
<i>Moxostoma macrolepidotum</i>			x		x	x
<i>Ameiurus natalis</i>				x		

Table A1. (continued) ... Collection summary from the tailwaters of Cherokee Dam.

Scientific Name	HRM 4 (12+)	HRM 17 (4)	HRM 25 (5)	HRM 33 (4)	HRM 44 (5)	HRM 51 (5)
<i>Ictalurus punctatus</i>	C		x	x	x	x
<i>Pylodictus olivaris</i>	x				x	x
<i>Oncorhynchus mykiss</i>					x	x
<i>Fundulus notatus</i>	C					
<i>Gambusia affinis</i>			x	x		
<i>Labidesthes sicculus</i>	x					x
<i>Cottus carolinae</i>	x	C	C	C	x	C
<i>Morone chrysops</i>	x		x	x	x	x
<i>Morone mississippiensis</i>	C			C		x
<i>Ambloplites rupestris</i>	x		C	x	x	x
<i>Lepomis auritus</i>	x		x	x	x	x
<i>Lepomis cyanellus</i>						x
<i>Lepomis gulosus</i>	x			x		x
<i>Lepomis macrochirus</i>	x		x	x	x	C
<i>Lepomis megalotis</i>	x					C
<i>Lepomis microlophus</i>	C		x	x		x
<i>Micropterus dolomieu</i>	x		x		x	x
<i>Micropterus punctulatus</i>	x			x		x
<i>Micropterus salmoides</i>	x			x	x	C
<i>Pomoxis annularis</i>	x					x
<i>Pomoxis nigromaculatus</i>					x	
<i>Etheostoma blennioides</i>	x	C	C	x	x	

Scientific Name	HRM 4 (12+)	HRM 17 (4)	HRM 25 (5)	HRM 33 (4)	HRM 44 (5)	HRM 51 (5)
<i>Etheostoma camurum</i>	C	C				
<i>Etheostoma kennicotti</i>	x					
<i>Etheostoma rufilineatum</i>	x	C	C	x		
<i>Etheostoma simoterum</i>	x	C	C	x	x	x
<i>Etheostoma zonale</i>	x	C	x	x		
<i>Percina caprodes</i>	x	C	x	x	x	x
<i>Percina evides</i>	C		x			
<i>Percina tanasi</i>	C	x				
<i>Stizostedion canadense</i>	x				x	x
<i>Aplodinotus grunniens</i>	C		x	x	x	x

Table A2. Collections from Holston River miles 4-6. Fifty-four nominal species collected from 1967 to 1993 in 12+ collections. Number of samples (#) per column are listed where (#+) indicates an additional undetermined number of samples were combined by the original investigator. The collections summarized below were made by D.A. Etnier from 1967, 1968, 1969, and 1970 (DAE 1960s); W.J. Rainboth in 1977 (WJR 1977); B.H. Bauer in 1980 (BHB 1980); the Tennessee Valley Authority in 1985 (TVA 1985) and 1989 (TVA 1989); W.C. Starnes in 1991 (WCS 1991); and M.H. Hughes in 1991, 1992, and 1993 (MH 1990s). C= cataloged specimens; x= species reported.

Scientific Name	DAE 1960s (4)	WJR 1977 (1)	BHB 1980 (1)	TVA 1985 (1)	TVA 1989 (1+)	WCS 1991 (1)	MH 1990s (3)
<i>Lepisosteus osseus</i>					x		
<i>Hiodon tergisus</i>		C			x		
<i>Alosa chrysochloris</i>	x						x
<i>Dorosoma cepedianum</i>	x				x		
<i>Dorosoma pelenense</i>	x		x		x		
<i>Camptostoma anomalum</i>	x						
<i>Carassius auratus</i>					x		
<i>Cyprinella galactura</i>		C					
<i>Cyprinella spiloptera</i>	x		x		x		x
<i>Cyprinus carpio</i>					x		x
<i>Luxilus coccogenis</i>	x						
<i>Macrhybopsis aestivalis</i>	C		x		x		C
<i>Macrhybopsis storeriana</i>	x						
<i>Nocomis micropogon</i>	C						
<i>Notropis atherinoides</i>	x	C					
<i>Notropis rubellus</i>	x			C			
<i>Notropis stramineus</i>			C				
<i>Pimephales notatus</i>					x		
<i>Pimephales promelas</i>	x						
<i>Pimephales vigilax</i>	x				x		
<i>Carpionodes carpio</i>					x		
<i>Hypentelium nigricans</i>					x		
<i>Ictiobus bubalus</i>					x		
<i>Moxostoma carinatum</i>					x		
<i>Moxostoma duquesnei</i>					x		
<i>Moxostoma erythrurum</i>					x		
<i>Ictalurus punctatus</i>	x	C			x		x
<i>Pylodictus olivaris</i>					x		
<i>Fundulus notatus</i>			C				
<i>Labidesthes sicculus</i>					x		
<i>Cottus caroliniae</i>	x		x		x		
<i>Morone chrysops</i>	x				x		x

Table A2. (continued) ... Collections from Holston River miles 4-6.

Scientific Name	DAE 1960s (4)	WJR 1977 (1)	BHB 1980 (1)	TVA 1985 (1)	TVA 1989 (1+)	WCS 1991 (1)	MHH 1990s (3)
<i>Morone mississippiensis</i>					X		C
<i>Ambloplites rupestris</i>			X		X		X
<i>Lepomis auritus</i>			X		X		X
<i>Lepomis gulosus</i>					X		
<i>Lepomis macrochirus</i>			X		X		
<i>Lepomis megalotis</i>					X		
<i>Lepomis microlophus</i>			C		X		X
<i>Micropterus dolomieu</i>					X		X
<i>Micropterus punctulatus</i>					X		
<i>Micropterus salmoides</i>					X		
<i>Pomoxis annularis</i>	X						
<i>Etheostoma blennioides</i>	X		X		X		X
<i>Etheostoma camurum</i>	X			C			
<i>Etheostoma kennicotti</i>	X		X				
<i>Etheostoma rufilineatum</i>			X				X
<i>Etheostoma simoterum</i>	X		X		X		X
<i>Etheostoma zonale</i>							X
<i>Percina caprodes</i>	X				X		X
<i>Percina evides</i>	C		X				
<i>Percina tanasi</i>					X	C	
<i>Stizostedion canadense</i>					X		
<i>Aplodinotus grunniens</i>	X	C			X		X

Table A3. Collections from Holston River miles 14-17. Thirteen nominal species collected from 1978 to 1991 in 4 collections. Number of samples (#) per column are listed. The collections summarized below were made by the Tennessee Valley Authority in 1978 (TVA 1978), J.R. Shute in 1983 (JRS 1983), and M.H. Hughes in 1991 (MHH 1991).

C= catalogued specimens; x= species reported.

Scientific Name	TVA 1978 (1)	JRS 1983 (1)	MHH 1991 (2)
<i>Hiodon tergisus</i>		C	
<i>Campostoma anomalum</i>			x
<i>Cyprinella spiloptera</i>			x
<i>Nocomis micropogon</i>			x
<i>Notropis volucellus</i>			x
<i>Cottus carolinae</i>			C
<i>Etheostoma blennioides</i>			C
<i>Etheostoma camurum</i>	C		
<i>Etheostoma rufileatum</i>			C
<i>Etheostoma simoterum</i>			C
<i>Etheostoma zonale</i>			C
<i>Percina caprodes</i>			C
<i>Percina tanasi</i>	x		

Table A4. Collections from Holston River mile 25. Thirty-six nominal species collected from 1974 to 1993 in 5 collections. The number of samples per column (#) are listed. The collections summarized below were made by the Tennessee Valley Authority in 1974, 1989, 1991, and 1993 (TVA 1974, 1989, 1991, and 1993) and M.H. Hughes in 1991 (MHH 1991) . C= catalogued specimens; x= species reported.

Scientific Name	TVA 1974 (1)	TVA 1989 (1)	MHH 1991 (1)	TVA 1991 (1)	TVA 1993 (1)
<i>Lepisosteus osseus</i>					x
<i>Hiodon tergisus</i>		x			
<i>Dorosoma cepedianum</i>	x	x		x	x
<i>Dorosoma petenense</i>	x			x	
<i>Campostoma anomalum</i>	x		C	x	x
<i>Cyprinella spiloptera</i>	x	x	C	x	x
<i>Cyprinus carpio</i>	x	x	x	x	x
<i>Hybopsis amblops</i>			C		
<i>Luxilus chrysocephalus</i>			C		x
<i>Macrhybopsis aestivalis</i>	x			x	
<i>Nocomis micropogon</i>	x			x	
<i>Pimephales notatus</i>		x		x	
<i>Hypentelium nigricans</i>	x	x	C		x
<i>Ictiobus bubalus</i>		x		x	x
<i>Ictiobus niger</i>					x
<i>Moxostoma anisurum</i>		x		C	
<i>Moxostoma carinatum</i>		x			
<i>Moxostoma duquesei</i>		x			

Scientific Name	TVA 1974 (1)	TVA 1989 (1)	MHH 1991 (1)	TVA 1991 (1)	TVA 1993 (1)
<i>Moxostoma erythrurum</i>		x		x	x
<i>Moxostoma macrolepidotum</i>		x			
<i>Ictalurus punctatus</i>		x		x	x
<i>Gambusia affinis</i>				x	
<i>Cottus carolinae</i>	x	x	C	x	x
<i>Morone chrysops</i>		x			
<i>Ambloplites rupestris</i>	x	x	C	x	x
<i>Lepomis auritus</i>		x		x	x
<i>Lepomis macrochirus</i>	x	x		x	x
<i>Lepomis microlophus</i>				x	
<i>Micropterus dolomieu</i>		x		x	x
<i>Etheostoma blennioides</i>	x	x	C	x	x
<i>Etheostoma rufilineatum</i>	x	x	C	x	x
<i>Etheostoma simoterum</i>	x	x	C	x	x
<i>Etheostoma zonale</i>		x		x	x
<i>Percina caprodes</i>	x	x		x	x
<i>Percina evides</i>	x				
<i>Aplodinotus grunniens</i>		x		x	x

Table A5. Collections from Holston River mile 33. Thirty-two nominal species collected from 1987 to 1993 in 4 collections. Number of samples per column (#) are listed. The collections summarized below were made by Tennessee Wildlife Resources Agency in 1987 (TWRA 1987) and Tennessee Valley Authority in 1989, 1991, and 1993 (TVA 1989, 1991, and 1993).

C= catalogued specimens; x= species reported.

Scientific Name	TWRA 1987 (1)	TVA 1989 (1)	TVA 1991 (1)	TVA 1993 (1)
<i>Lepisosteus osseus</i>				X
<i>Dorosoma cepedianum</i>	X	X	X	X
<i>Dorosoma petenense</i>	X		X	
<i>Camptostoma anomalum</i>				X
<i>Cyprinella spiloptera</i>	C	X	X	X
<i>Cyprinus carpio</i>	X	X	X	X
<i>Pimephales notatus</i>		X	X	
<i>Pimephales promelas</i>			X	
<i>Pimephales vigilax</i>		X		
<i>Hypentelium nigricans</i>	C		X	X
<i>Ictiobus bubalus</i>		X	X	X
<i>Ictiobus niger</i>	X			X
<i>Moxostoma erythrurum</i>				X
<i>Ameiurus natalis</i>			X	
<i>Ictalurus punctatus</i>	X	X	X	X
<i>Gambusia affinis</i>			X	

Scientific Name	TWRA 1987 (1)	TVA 1989 (1)	TVA 1991 (1)	TVA 1993 (1)
<i>Cottus carolinae</i>	C	X	X	X
<i>Morone chrysops</i>	X	X		
<i>Morone mississippiensis</i>	C			
<i>Ambloplites rupestris</i>		X	X	X
<i>Lepomis auritus</i>	X	X	X	X
<i>Lepomis gulosus</i>		X	X	X
<i>Lepomis macrochirus</i>	X	X	X	X
<i>Lepomis microlophus</i>				X
<i>Micropterus punctulatus</i>				X
<i>Micropterus salmoides</i>	X	X		X
<i>Etheostoma blennioides</i>	X	X	X	X
<i>Etheostoma rufilineatum</i>	X	X	X	X
<i>Etheostoma simoterum</i>	X	X	X	X
<i>Etheostoma zonale</i>	X	X		
<i>Percina caprodes</i>	X	X		X
<i>Aplodinotus grunniens</i>	X	X		X

Table A6. Collections from Holston River mile 44. Thirty-two nominal species collected from 1953 to 1993 in 5 collections. Number of samples per column (#) are listed. The collections summarized below were made by Tennessee Game and Fish Commission in 1953 (TGFC 1953); M.H. Hughes in 1991 (MHH 1991) and the Tennessee Valley Authority in 1989, 1991, and 1993 (TVA 1989, 1991, and 1993).

C= catalogued specimens; x= species reported.

Scientific Name	TGFC 1953 (1)	TVA 1989 (1)	MHH 1991 (1)	TVA 1991 (1)	TVA 1993 (1)
<i>Lepisosteus osseus</i>				x	
<i>Hiodon tergisus</i>	x				
<i>Alosa chrysochloris</i>	x				
<i>Dorosoma cepedianum</i>	x	x		x	x
<i>Dorosoma petenense</i>	x			x	x
<i>Camptostoma anomalum</i>			x		
<i>Cyprinella spiloptera</i>				x	
<i>Cyprinus carpio</i>	x	x	x	x	x
<i>Nocomis micropogon</i>		x			
<i>Catostomus commersoni</i>			x		
<i>Hypentelium nigricans</i>		x		x	x
<i>Ictiobus bubalus</i>				x	x
<i>Ictiobus niger</i>	x			x	x
<i>Moxostoma anisurum</i>	x			x	x
<i>Moxostoma carinatum</i>	x				
<i>Moxostoma macrolepidotum</i>	x				
<i>Ictalurus punctatus</i>	x	x		x	x

Scientific Name	TGFC 1953 (1)	TVA 1989 (1)	MHH 1991 (1)	TVA 1991 (1)	TVA 1993 (1)
<i>Pylodictus olivaris</i>	x				
<i>Oncorhynchus mykiss</i>	x				x
<i>Cottus carolinae</i>	x	x	x	x	x
<i>Morone chrysops</i>	x				
<i>Ambloplites rupestris</i>				x	x
<i>Lepomis auritus</i>		x		x	x
<i>Lepomis macrochirus</i>	x	x		x	x
<i>Micropterus dolomieu</i>	x			x	x
<i>Micropterus salmoides</i>	x			x	x
<i>Pomoxis nigromaculatus</i>	x			x	x
<i>Etheostoma blennioides</i>				x	
<i>Etheostoma simoterum</i>		x	x	x	x
<i>Percina caprodes</i>	x			x	x
<i>Stizostedion canadense</i>				x	
<i>Aplodinotus grunniens</i>	x	x		x	x

Table A7. Collections from Holston River mile 51. Forty-four nominal species collected from 1951 to 1989 from 6 collections. Number of samples per column (#) are listed. The collections summarized below were by W.S. Woolcott in 1952 and 1953 (WSW 1952-53); Tennessee Game and Fish Commission in 1951 and 1953 (TGFC 1951 and TGFC 1953) and the Tennessee Valley Authority in 1974 and 1989 (TVA 1974 and 1989). C= catalogued specimens; x= species reported.

Scientific Name	TGFC 1951 (1)	WSW 1952-53 (2)	TGFC 1953 (1)	TVA 1974 (1)	TVA 1989 (1)
<i>Polyodon spathula</i>					x
<i>Lepisosteus osseus</i>					x
<i>Hiodon tergisus</i>	x		x		
<i>Alosa chrysochloris</i>	x		x	x	x
<i>Alosa pseudoharengus</i>					x
<i>Dorosoma cepedianum</i>		C	x	x	x
<i>Dorosoma petenense</i>				x	x
<i>Carassius auratus</i>					x
<i>Cyprinella spiloptera</i>		C			x
<i>Cyprinus carpio</i>	x				x
<i>Macrhybopsis storeriana</i>				x	
<i>Notemigonus crysoleucas</i>					x
<i>Pimephales notatus</i>					x
<i>Rhinichthys atratulus</i>		C			
<i>Carpionodes carpio</i>					x
<i>Carpionodes cyprinus</i>					x
<i>Cycleptus elongatus</i>	x		x		
<i>Hypentelium nigricans</i>					x
<i>Ictiobus bubalus</i>					x
<i>Moxostoma anisurum</i>			x		
<i>Moxostoma carinatum</i>			x		
<i>Moxostoma macrolepidotum</i>			x		
<i>Ictalurus punctatus</i>			x		x

Scientific Name	TGFC 1951 (1)	WSW 1952-53 (2)	TGFC 1953 (1)	TVA 1974 (1)	TVA 1989 (1)
<i>Pylodictus olivaris</i>					x
<i>Oncorhynchus mykiss</i>			x		x
<i>Labidesthes sicculus</i>			x		x
<i>Cottus caroliniae</i>		C	x		x
<i>Morone chrysops</i>	x		x		x
<i>Morone mississippiensis</i>					x
<i>Ambloplites rupestris</i>					x
<i>Lepomis auritus</i>					x
<i>Lepomis cyanellus</i>					x
<i>Lepomis gulosus</i>					x
<i>Lepomis macrochirus</i>	x	C	x	x	x
<i>Lepomis megalotis</i>		C			
<i>Lepomis microlophus</i>					x
<i>Micropterus dolomieu</i>					x
<i>Micropterus punctulatus</i>					x
<i>Micropterus salmoides</i>		C			x
<i>Pomoxis annularis</i>	x		x		x
<i>Etheostoma simoterum</i>					x
<i>Percina caprodes</i>				x	x
<i>Stizostedion canadense</i>	x		x		
<i>Aplodinotus grunniens</i>			x		x

Table A8. Collection summary from the vicinity of Cherokee Lake. Seventy-seven nominal species and one undescribed taxon reported from 357 collections from 1941 to 1992. Number of samples per column (#) are listed. The collections summarized below were collected prior to impoundment by the Tennessee Department of Conservation in 1940 (TDC 1940), Tennessee Valley Authority hoop-nets in April-September, 1941 (TVA 1941a), June, 1941 (TVA 1941b), and September, 1941 (TVA 1941c), and after impoundment by TVA in 1948 (TVA 1948), TVA cove rotenone samples from 1949 through 1991 (TVA 1949+), W.S. Woolcott in 1952 (WSW 1952), Tennessee Game and Fish Commission in 1968 (TGFC 1968), F.L. Oakberg in 1972 (FLO 1972), W.C. Starnes in 1975 (WCS 1975), Tennessee Wildlife Resources Agency in 1983, 1985, and 1986 (TWRA 1980s), TVA electrofishing and gill-netting in 1989, 1990, and 1991 (TVA 1989+), and B. Houck angling in 1992 (B.H. 1992).

C= catalogued specimens; x= species reported; ?= questionable identification without voucher specimen.

Scientific Name	TDC 1940 (1)	TVA 1941a (107)	TVA 1941b (1)	TVA 1941c (29)	TVA 1948 (1)	TVA 1949+ (110)	WSW 1952 (1)	TGFC 1968 (1)	FLO 1972 (1)	WCS 1975 (1)	TWRA 1980s (5)	TVA 1989+ (98)	B.H. 1992 (1)
<i>Lampetra appendix</i>	C												
<i>Lepisosteus osseus</i>		x		C		x			x		C	x	
<i>Alosa pseudoharengus</i>						x					C		
<i>Dorosoma cepedianum</i>						x	C		x	x		x	
<i>Dorosoma petenense</i>						x			x		C	x	
<i>Hiodon tergisus</i>		x				x							
<i>Campostoma anomalum</i>				C		C						x	
<i>Carassius auratus</i>						x						x	
<i>Cyprinella galactura</i>				C		x							
<i>Cyprinella spiloptera</i>				C		x	C					x	
<i>Cyprinus carpio</i>		x		C		x			x		C	x	

A8. (continued) ... Collection summary from Cherokee Lake.

Scientific Name	TDC 1940 (1)	TVA 1941a (107)	TVA 1941b (1)	TVA 1941c (29)	TVA 1948 (1)	TVA 1949+ (110)	WSW 1952 (1)	TGFC 1968 (1)	FLO 1972 (1)	WCS 1975 (1)	TWRA 1980s (5)	TVA 1989+ (98)	B.H. 1992 (1)
<i>Erimystax cahni</i>				C									
<i>Erimystax dissimilis</i>				C									
<i>Hybopsis amblops</i>				C									
<i>Luxilus chrysocephalus</i>				C		x							
<i>Luxilus coccogenis</i>				C									
<i>Lythrurus ardens</i>				C									
<i>Nocomis micropogon</i>				C		x							
<i>Notemigonus crysoleucas</i>						x							
<i>Notropis ariommus</i>				C									
<i>Notropis atherinoides</i>						?							
<i>Notropis leuciodus</i>				C		x							
<i>Notropis photogenis</i>				C		x							
<i>Notropis rubellus</i>				C		x							
<i>Notropis cf. spectrunculus</i>				C									
<i>Notropis stramineus</i>				C		x							
<i>Notropis telescopus</i>				C									
<i>Notropis volucellus</i>				C									
<i>Phenacobius uranops</i>				C									
<i>Pimephales notatus</i>				C		x				x		x	

A8. (continued) ... Collection summary from Cherokee Lake.

Scientific Name	TDC 1940 (1)	TVA 1941a (107)	TVA 1941b (1)	TVA 1941c (29)	TVA 1948 (1)	TVA 1949+ (110)	WSW 1952 (1)	TGFC 1968 (1)	FLO 1972 (1)	WCS 1975 (1)	TWRA 1980s (5)	TVA 1989+ (98)	B.H. 1992 (1)
<i>Pimephales promelas</i>						x							
<i>Pimephales vigilax</i>						x						x	
<i>Rhinichthys atratulus</i>				C									
<i>Semotilus atromaculatus</i>				C		x							
<i>Carpionodes carpio</i>				C		x			x		C	x	
<i>Carpionodes cyprinus</i>				C		x			C		C	x	
<i>Carpionodes velifer</i>				x									
<i>Catostomus commersoni</i>				C		x							
<i>Hypentelium nigricans</i>		x		C		x						x	
<i>Ictiobus bubalus</i>						x						x	
<i>Ictiobus niger</i>													C
<i>Moxostoma anisurum</i>				C									
<i>Moxostoma carinatum</i>			C			x						x	
<i>Moxostoma duquesnei</i>				C		x		C	C			x	
<i>Moxostoma erythrum</i>				C		x	C					x	
<i>Moxostoma macrolepidotum</i>				C		C							
<i>Ameiurus melas</i>						x							
<i>Ameiurus natalis</i>				C		x						x	
<i>Ictalurus furcatus</i>						x						x	

A8. (continued) ... Collection summary from Cherokee Lake.

Scientific Name	TDC 1940 (1)	TVA 1941a (107)	TVA 1941b (1)	TVA 1941c (29)	TVA 1948 (1)	TVA 1949+ (110)	WSW 1952 (1)	TGFC 1968 (1)	FLO 1972 (1)	WCS 1975 (1)	TWRA 1980s (5)	TVA 1989+ (98)	B.H. 1992 (1)
<i>Ictalurus punctatus</i>		x		C		C			x		C	x	
<i>Pylodictus olivaris</i>		x		C		x			x		C	x	
<i>Gambusia affinis</i>						x						x	
<i>Labidesthes sicculus</i>						x	C				C	x	
<i>Cottus caroliniae</i>				C		x							
<i>Morone chrysops</i>						x			x		C	x	
<i>Morone saxatilis</i>						x			x		C	x	
<i>Ambloplites rupestris</i>		x		C		x						x	
<i>Lepomis auritus</i>				C		x						x	
<i>Lepomis cyanellus</i>				x		x						x	
<i>Lepomis gulosus</i>						x				x		x	
<i>Lepomis macrochirus</i>		x		C		x	C		x	x		x	
<i>Lepomis megalotis</i>		x		C		x						x	
<i>Lepomis microlophus</i>						x						x	
<i>Micropterus dolomieu</i>		x		C		x						x	
<i>Micropterus punctulatus</i>		x		C	C	x				x		x	
<i>Micropterus salmoides</i>		x		C		x	C		x	x		x	
<i>Pomoxis annularis</i>						x			x		C	x	
<i>Pomoxis nigromaculatus</i>						x					C	x	

A8. (continued) ... Collection summary from Cherokee Lake.

Scientific Name	TDC 1940 (1)	TVA 1941a (107)	TVA 1941b (1)	TVA 1941c (29)	TVA 1948 (1)	TVA 1949+ (110)	WSW 1952 (1)	TGFC 1968 (1)	FLO 1972 (1)	WCS 1975 (1)	TWRA 1980s (5)	TVA 1989+ (98)	B.H. 1992 (1)
<i>Etheostoma blennioides</i>				C		X							
<i>Etheostoma camurum</i>				C									
<i>Etheostoma jessiae</i>				C									
<i>Etheostoma rufilineatum</i>				C		X							
<i>Etheostoma simoterum</i>				C		X							
<i>Percina caprodes</i>				C		C	C					X	
<i>Percina sciera</i>				C									
<i>Stizostedion canadense</i>		X		C	C	X							
<i>Stizostedion vitreum</i>						X	X					X	
<i>Aplodinotus grunniens</i>						X			X			X	

Table A9. Collection summary from vicinity of Cherokee Lake by the Tennessee Valley Authority (TVA) in September, 1941. Fifty-three nominal species collected from 30 samples from the preimpounded Holston River and its tributaries. All catalogued specimens are at the University of Michigan Museum of Comparative Zoology (UMMZ) at Ann Arbor. Specimens were identified in 1978 by D.A. Etnier, B.H. Bauer, J.L. Harris, D.L. Nieland, W.C. Starnes of the University of Tennessee and J.C. Feeman and C.F. Saylor of TVA. At UMMZ, R.M. Bailey confirmed the identifications in 1978 and D.W. Nelson catalogued the majority of the specimens in the 1990s. TVA collection numbers at the top of the columns are prefaced by "TVA 1941-s" on the original TVA data sheets and UMMZ accession numbers. Collection numbers 50-73 progress upstream from HRM 52 to 111 on the south side of the river and then cross the river as numbers 74 to 86 proceed downstream from HRM 111 to 52 along the north side of the river. A single mainstream channel collection from the Holston River is represented by column 68.. C= catalogued specimens; x= species reported.

Scientific Name	50	51	54	56	58	61	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
<i>Lepisosteus osseus</i>		C																												
<i>Camptostoma anomalum</i>	C	C	C	C	C	C	C	C	C	C	C	x	C	x	C	C		C		C	C	C	C	C	C	C	x	C	C	C
<i>Cyprinella galactura</i>					x			C		C	C	C	C	x				C	C	C	C	C								
<i>Cyprinella spiloptera</i>	C		C	C	C	C	C	C	C	C	C	C	C	x	x	C	C	C	C	C	C	C	C	C	C	C	x	C	C	C
<i>Cyprinus carpio</i>						C	C								C															
<i>Erimystax cahni</i>												C																		
<i>Erimystax dissimilis</i>												C																		
<i>Hybopsis amblops</i>	C		C	C	C	C	C	C	C	C	C	C	C	x	x	C	C	C	C	C	C	C	C	C	C	C			C	C
<i>Luxilus chrysocephalus</i>	C	C	C	C	C	C	C	C	C	C	C	C	C	x	C	C	C	C	C	C	C	C	C	C	C	C	x	C	C	C
<i>Luxilus coccogenis</i>																		C					C	C	C	C		C		
<i>Lythrurus ardens</i>															C	C							C	C	C					
<i>Nocomis micropogon</i>	C	C	C	C	C	C	C	C	C	C	C	C	C	x		C	C	C		C	C		C	C	C	C	x	C	C	C
<i>Notropis ariommus</i>														x									C							
<i>Notropis leuciodus</i>																		C												
<i>Notropis photogenis</i>												C																		
<i>Notropis rubellus</i>			C		C	C	C	C	C			C			x	x		C		C	C		C	C	C	C	x			

Table A9. (continued) ... Collection summary from vicinity of Cherokee Lake by TVA in 1941.

Scientific Name	50	51	54	56	58	61	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
<i>Notropis cf. spectrunculus</i>			C	C	C	C	C	C	C	C	C	C	C	x		C		C	C	C	C		C		C					
<i>Notropis stramineus</i>	C					C				C			C	x	C	C	C		C	C	C				C		x			
<i>Notropus telescopus</i>																		C												
<i>Notropis volucellus</i>			C	C	C		C	C	C	C	C	C	C	x	C	C	C	C	C	C	C	C	C	C	C			C		
<i>Phenacobius uranops</i>			C			C						C						C		C	C				C					
<i>Pimephales notatus</i>						C								x	x	C					C		C							
<i>Rhinichthys atratulus</i>	C	C	C	C	C	C		C	C	C	C		C	x				C	C	C	C			C		C	x	C	C	C
<i>Semotilus atromaculatus</i>						C							C								x			C						
<i>Carpionodes carpio</i>							C									C														
<i>Carpionodes cyprinus</i>		C														x	C						C							
<i>Carpionodes velifer</i>																	x													
<i>Catostomus commersoni</i>	C	C	C			C	C		C		C		C	x	C	C				C	C	C		C	C	C	x		C	C
<i>Hypentelium nigricans</i>	C		C	C	C	C	C	C				x						C		C	C		C	C	C	C	x		C	C
<i>Moxostoma anisurum</i>	x																								C					
<i>Moxostoma duquesnei</i>	C	C	C	C	C	C	C									C			C		C		C	C		C	C			C
<i>Moxostoma erythrurum</i>	C		C	C		C	C		C	C		C	C	x	C	C	C	C		C	C	C	C	C	C	C				
<i>Moxostoma macrolepidotum</i>												C																		
<i>Ameiurus natalis</i>	C		C		C	C	C	C		C			C		C						C	C	C			C	x			
<i>Ictalurus punctatus</i>			C		C	C	C	C				C		x	C					C	C		C							
<i>Pylodictus olivaris</i>			C		x	C	C					x																		
<i>Cottus carolinæ</i>	C		C	C	C	C	C	C		C		C				C		C		C			C	C	C	C	x	C	C	C
<i>Ambloplites rupestris</i>	C	C	C	C	C	C					C	C	C	x		C		C		C	x		C	C	C	C	x		C	
<i>Lepomis auritus</i>	C				C	C																			C		x			

Table A9. (continued) ... Collection summary from vicinity of Cherokee Lake by TVA in 1941.

Scientific Name	50	51	54	56	58	61	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
<i>Lepomis cyanellus</i>						x																								
<i>Lepomis macrochirus</i>	C		C		C		x					x		x	C	C	C	C	C			C	C			C				
<i>Lepomis megalotis</i>	C		C			x	C	C				C	C	x	C	C		C		C	C	C	C		C	C		C		
<i>Micropterus dolomieu</i>	C		C		C	C	C								C		C						C	C	C					
<i>Micropterus punctulatus</i>												C		C	x	C	C	C		C			C		C					
<i>Micropterus salmoides</i>	C		C			C								x								C		x						
<i>Etheostoma blennioides</i>	C			C		C										C		C		C			C	C	x	C	x	x	C	
<i>Etheostoma camurum</i>																						C								
<i>Etheostoma jessiae</i>														x			C				C		C	C	C					
<i>Etheostoma rufilineatum</i>																		C					C		C					
<i>Etheostoma simoterum</i>		C	C	C		C		C			C	C	C	x	x	C	C	C	C	C	C	C	C	C	C	C			C	
<i>Percina caprodes</i>												C				C	C						C							
<i>Percina sciera</i>			C		C	x	C	C															C		C					
<i>Stizostedion canadense</i>																							C							

Table A10. Collections from Holston River miles 113 to 142. Fifty-six nominal species and one undescribed taxon collected from 14 samples from Holston River mile (HRM) 113, 118, 119, 133, 136, and 142 by the Academy of Natural Sciences of Philadelphia in 1965, 1974, 1980, and 1990 (ANSP 1965, 1974, 1980, and 1990); the Tennessee Wildlife Resources Agency in 1987 (TWRA 1987); M.H. Hughes in 1990 (MHH 1990); R.L. Mayden in 1992 (RLM 1992); the Tennessee Valley Authority in 1987, 1990, 1991, and 1992 (TVA 1990, 1991, and 1992).
HRM # = Holston River mile; C = catalogued specimens; x = species reported.

	HRM 113		HRM 118				HRM 119			HRM 133		HRM 136		HRM 142
Scientific Name	TVA 1987	MHH 1990	TVA 1987	TVA 1990	TVA 1991	TVA 1992	TVA 1987	TWRA 1987	RLM 1992	ANSP 1980	ANSP 1990	ANSP 1965	TWRA 1987	ANSP 1974
<i>Alosa pseudoharengus</i>			x											
<i>Dorosoma cepedianum</i>	x			x	x		x						x	
<i>Dorosoma petenense</i>		C				x								
<i>Camptostoma anomalum</i>				C		C	x	x	C		C	C	x	C
<i>Carassius auratus</i>				x	x	x	x	x						
<i>Cyprinella galactura</i>		C	x	C	C	C		x		C			C	C
<i>Cyprinella monacha</i>						x								
<i>Cyprinella spiloptera</i>	x	C	x	C	C	C	x	x					C	C
<i>Cyprinus carpio</i>			x	x	x	x	x	x				C	C	
<i>Erimystax dissimilis</i>				C	C	C		C	C				C	
<i>Hybopsis amblops</i>				C	C	C			C					
<i>Luxilus chrysocephalus</i>	x		x	C	C	C	x	x		C		C		
<i>Luxilus coccogenis</i>	x		x		C	C	x	x	C				C	
<i>Nocomis micropogon</i>	x		x	C	C	C	x	x	C		C	C	x	
<i>Notropis ariommus</i>						C								
<i>Notropis leuciodus</i>				C	C	C	x	x	C		C		C	
<i>Notropis photogenis</i>				C	C	C		C		C				
<i>Notropis rubellus</i>		C		C	C	C	x	x					C	C

Table A10. (continued) ... Collections from Holston River miles 113 to 142.

	HRM 113		HRM 118				HRM 119			HRM 133		HRM 136		HRM 142
Scientific Name	TVA 1987	MHH 1990	TVA 1987	TVA 1990	TVA 1991	TVA 1992	TVA 1987	TWRA 1987	RLM 1992	ANSP 1980	ANSP 1990	ANSP 1965	TWRA 1987	ANSP 1974
<i>Notropis rubricroceus</i>				C										
<i>Notropis cf. spectrunculus</i>	x		x	C	C	C	x		C				C	C
<i>Notropis telescopus</i>				C	C	C	x	x		C			C	
<i>Notropis volucellus</i>								x						
<i>Phenacobius uranops</i>				C	C	C			C				C	
<i>Pimephales notatus</i>	x	C	x							C		C		C
<i>Pimephales vigilax</i>		C												
<i>Rhinichthys atratulus</i>												C		C
<i>Semotilus atromaculatus</i>												C		
<i>Catostomus commersoni</i>												C		
<i>Carpionodes carpio</i>	x		x	x		x	x	x					x	
<i>Carpionodes cyprinus</i>				x	x									
<i>Hypentelium nigricans</i>	x			x	x	x	x	x					x	C
<i>Moxostoma carinatum</i>					x									
<i>Moxostoma duquesnei</i>	x			x	x	x	x					C	C	C
<i>Moxostoma erythrurum</i>	x			x	x	x	x							
<i>Moxostoma macrolepidotum</i>					C									
<i>Ameiurus natalis</i>	x		x	x	x	x	x	C	C	C		C	x	C
<i>Ictalurus punctatus</i>		C	x	x	x	x	x	x					x	
<i>Pylodictus olivaris</i>			x	x	x									
<i>Gambusia affinis</i>				x	x	x				C		C		

Table A10. (continued) ... Collections from Holston River miles 113 to 142.

	HRM 113		HRM 118				HRM 119			HRM 133		HRM 136		HRM 142
Scientific Name	TVA 1987	MHH 1990	TVA 1987	TVA 1990	TVA 1991	TVA 1992	TVA 1987	TWRA 1987	RLM 1992	ANSP 1980	ANSP 1990	ANSP 1965	TWRA 1987	ANSP 1974
<i>Cottus caroliniae</i>			x	x	x		x		C				x	C
<i>Morone saxatilis</i>		C												
<i>Ambloplites rupestris</i>	x		x	x	x	x	x	x	C			C	x	C
<i>Lepomis auritus</i>	x		x	x	x	x	x	C				C	x	C
<i>Lepomis macrochirus</i>	x	x		x	x	x		x				C		C
<i>Lepomis megalotis</i>			x	x		x				C				C
<i>Lepomis microlophus</i>				x	x	x		x						
<i>Micropterus dolomieu</i>	x		x	x	x	x	x	x		C			x	C
<i>Micropterus salmoides</i>						x				C				C
<i>Pomoxis annularis</i>												C		
<i>Etheostoma blennioides</i>			x	C	C	C	x	x	C	C			C	
<i>Etheostoma camurum</i>				C	C	C			x		C		C	
<i>Etheostoma rufilineatum</i>				C	C	C	x	x	C	C	C		x	
<i>Etheostoma simoterum</i>						C		x	C	C				
<i>Etheostoma zonale</i>			x	C	C	C	x	x	C				x	
<i>Percina aurantiaca</i>			x	C	C	C	x		C					
<i>Percina caprodes</i>	x				x	C								
<i>Percina evides</i>				C	C	C								

APPENDIX B

Table B1. Collection summary of the North Fork Holston River. Scientific names of the 72 nominal species and one undescribed taxon of fishes taken from 1867 to 1993 in 212 collections. Number of samples (#) per column are listed. Data reported in sections (columns) moving upstream from left to right by counties in Tennessee (TN) and Virginia (VA). Hawkins and Sullivan (Haw/Sull), Scott (Scott), Washington (Wash), Smyth (Smyth), and Bland (Bland) counties. C= catalogued specimens; x= species reported; "C"= catalogued specimen with questionable locality data.

Scientific Name	Haw/Sull TN (17)	Scott VA (57)	Wash VA (89)	Smyth VA (44+)	Bland VA (5)
<i>Ichthyomyzon bdellium</i>				C	
<i>Ichthyomyzon greeleyi</i>				C	
<i>Lampetra appendix</i>				x	
<i>Lepisosteus osseus</i>				x	
<i>Dorosoma cepedianum</i>	x	C		x	
<i>Camptostoma anomalum</i>	C	C	C	C	x
<i>Carassius auratus</i>		x			
<i>Cyprinella galactura</i>	C	C	C	C	
<i>Cyprinella monacha</i>	C	C	C	C	
<i>Cyprinella spiloptera</i>	C	C	C	x	
<i>Cyprinus carpio</i>		x	C		
<i>Erimystax dissimilis</i>	C	C	C	C	
<i>Hybopsis amblops</i>	C	C	C	C	
<i>Luxilus chrysocephalus</i>	C	C	C	C	C
<i>Luxilus coccogenis</i>	C	C	C	C	x
<i>Nocomis micropogon</i>	C	C	C	C	x
<i>Notropis ariomnus</i>	C	x	C	x	
<i>Notropis leuciodus</i>	C	C	C	C	
<i>Notropis photogenis</i>	C	C	C	C	
<i>Notropis rubellus</i>	C	C	C	C	
<i>Notropis rubricroceus</i>			C	C	C
<i>Notropis cf. spectrunculus</i>	C	C	C	C	
<i>Notropis telescopus</i>	C	C	C	C	
<i>Notropis volucellus</i>	C	x	C	C	
<i>Phenacobius uranops</i>	C	C	C	C	
<i>Pimephales notatus</i>	x	x		x	
<i>Pimephales vigilax</i>		x			
<i>Rhinichthys atratulus</i>	C	x	C	C	C
<i>Semotilus atromaculatus</i>		x	x	x	C
<i>Carpiodes cyprinus</i>		x			
<i>Catostomus commersoni</i>		x	x	C	
<i>Hypentelium nigricans</i>	C	C	C	C	x
<i>Moxostoma duquesnei</i>	C	x	C	C	
<i>Moxostoma erythrurum</i>	C	C	x	C	
<i>Moxostoma lacerum</i>				C	

Table B1. (continued) ... Collection summary of the North Fork Holston River.

Scientific Name	Haw/Sull TN (17)	Scott VA (57)	Wash VA (89)	Smyth VA (44+)	Bland VA (5)
<i>Moxostoma macrolepidotum</i>		C		x	
<i>Ameiurus natalis</i>	x	x	C	x	
<i>Ameiurus nebulosus</i>				x	
<i>Ictalurus punctatus</i>	C	C	C	x	
<i>Noturus eleutherus</i>	C	x	C	x	
<i>Noturus flavipinnis</i>				C	
<i>Noturus insignis</i>			C	C	
<i>Pylodictus olivaris</i>	C	x	x	x	
<i>Esox masquinongy</i>				x	
<i>Oncorhynchus mykiss</i>				x	
<i>Salvelinus fontinalis</i>				x	
<i>Fundulus catenatus</i>	C	C	C	C	
<i>Cottus baileyi</i>					C
<i>Cottus carolinæ</i>	x	x	C	C	x
<i>Ambloplites rupestris</i>	C	C	C	C	
<i>Lepomis auritus</i>	C	C	C	x	
<i>Lepomis cyanellus</i>		x	C		
<i>Lepomis macrochirus</i>	C	x	x	C	
<i>Lepomis megalotis</i>	C	C	C	C	
<i>Micropterus dolomieu</i>	C	C	C	C	
<i>Micropterus salmoides</i>		x	x	x	
<i>Pomoxis annularis</i>		C			
<i>Pomoxis nigromaculatus</i>				x	
<i>Etheostoma blennioides</i>	C	x	C	C	
<i>Etheostoma camurum</i>	C	x	C	C	
<i>Etheostoma flabellare</i>			x	C	
<i>Etheostoma rufilineatum</i>	C	C	C	C	x
<i>Etheostoma simoterum</i>	C	x	C	C	C
<i>Etheostoma spectabile</i>				"C"	
<i>Etheostoma vulneratum</i>		x	C	C	
<i>Etheostoma zonale</i>	C	C	C	C	
<i>Percina aurantiaca</i>	C	C	C	C	
<i>Percina burtoni</i>		x	C	C	
<i>Percina caprodes</i>				C	
<i>Percina evides</i>	C	x	C		
<i>Percina macrocephala</i>		x	x	C	
<i>Percina maculata</i>				"C"	
<i>Percina sciera</i>		x			

Table B2. The North Fork Holston River, Hawkins/Sullivan County, Tennessee. Forty nominal species and one undescribed taxon of fishes from 17 collections. Number of samples (#) per column are listed. Collections summarized were collected by R.D. Ross in 1954 (RDR 1954); T. Zorach in 1963 (TZ 1963); D.A. Etnier in 1968 (DAE 1968); the Tennessee Valley Authority in 1975 and 1976 (TVA 1970s); R.E. Jenkins in 1975 (REJ 1975); N.M. Burkhead and R.E. Jenkins (NMB/REJ 1981); TVA and Tennessee Wildlife Resources Agency in 1989 (TVA/TWRA 1989); L.M. Page in 1990 (LMP 1990); and M.H. Hughes in 1991 (MHH 1991). C= catalogued specimens; x= species reported.

Scientific Name	RDR 1954 (5)	TZ 1963 (2)	DAE 1968 (1)	TVA 1970s (2)	REJ 1975 (2)	NMB/ REJ 1981 (1)	TVA/ TWRA 1989 (1)	LMP 1990 (1)	MHH 1991 (2)
<i>Dorosoma cepedianum</i>	x								
<i>Camptostoma anomalum</i>	x	C	x	x	x	x	C	C	C
<i>Cyprinella galactura</i>	x	C	x	x	x	x	C	C	C
<i>Cyprinella monacha</i>	C	C			x				
<i>Cyprinella spiloptera</i>							C		
<i>Erimystax dissimilis</i>		C	x	x	x	x	C		C
<i>Hybopsis amblops</i>	x		x	x	x		C		C
<i>Luxilus chrysocephalus</i>	x		x	x	x	x	C		C
<i>Luxilus coccogenis</i>	x	C	x	x	x	x	C		C
<i>Nocomis micropogon</i>	x	C	x	x	x	x	C	C	C
<i>Notropis ariommus</i>					x		C		
<i>Notropis leuciodus</i>	x	C	x	x	x		C		C
<i>Notropis photogenis</i>				x	x	x	C		C
<i>Notropis rubellus</i>	x	C	x	x	x	x	C		
<i>Notropis cf. spectrunculus</i>			x		x	x	C		C
<i>Notropis telescopus</i>	x	C	x	x	x	x	C		C
<i>Notropis volucellus</i>								C	
<i>Phenacobius uranops</i>		C	x		x				C
<i>Pimephales notatus</i>					x				

Table B2. (continued) ... The North Fork Holston River, Hawkins/Sullivan County, Tennessee.

Scientific Name	RDR 1954 (5)	TZ 1963 (2)	DAE 1968 (1)	TVA 1970s (2)	REJ 1975 (2)	NMB/ REJ 1981 (1)	TVA/ TWRA 1989 (1)	LMP 1990 (1)	MHH 1991 (2)
<i>Rhinichthys atratulus</i>			x				C		
<i>Hypentelium nigricans</i>		C		x	x	x	C		C
<i>Moxostoma duquesnei</i>				x	x		C		C
<i>Moxostoma erythrurum</i>					x		C		
<i>Ameiurus natalis</i>				x					
<i>Ictalurus punctatus</i>				x			C		
<i>Noturus eleutherus</i>				x	x		C	C	C
<i>Pylodictus olivaris</i>				x					C
<i>Fundulus catenatus</i>	x	C							
<i>Cottus carolinae</i>			x	x					
<i>Ambloplites rupestris</i>		C	x	x	x		C	C	C
<i>Lepomis auritus</i>					x	x	C		
<i>Lepomis macrochirus</i>							C		
<i>Lepomis megalotis</i>				x			C		
<i>Micropterus dolomieu</i>	x		x	x	x	x	C		C
<i>Etheostoma blennioides</i>	x	C	x	x	x		C		C
<i>Etheostoma camurum</i>			x	x			C		C
<i>Etheostoma rufilineatum</i>	x	C	x	x	x		C		C
<i>Etheostoma simoterum</i>	x			x	x	x		C	C
<i>Etheostoma zonale</i>	x	C	x	x	x	x	C		C
<i>Percina aurantiaca</i>				x	x				C
<i>Percina evides</i>		C	x	x	x		C		C

Table B3. North Fork Holston River in Scott County, Virginia. Fifty-four nominal species and one undescribed taxon of fishes from 57 collections. Number of samples (#) per column are listed. Collections summarized were collected by R.D. Ross in 1954, 1955, and 1956 (RDR 1950s); J. Cairns in 1954 (JC 1954); R.F. Denoncourt in 1967 (RFD 1967); R.E. Jenkins in 1971, 1972, 1973, 1974, and 1975 (REJ 1970s); the Tennessee Valley Authority in 1971, 1972, 1973, 1974, 1975, and 1976 (TVA 1970s); N.M. Burkhead in 1981, 1983, 1984, and 1985 (NMB 1980s); and R.L. Mayden in 1987 (RLM 1987).

C= catalogued specimens; x= species reported.

Scientific Name	RDR 1950s (14)	JC 1954 (1)	RFD 1967 (1)	REJ 1970s (14)	TVA 1970s (18)	NMB 1980s (8)	RLM 1987 (1)
<i>Dorosoma cepedianum</i>		C		x	x	x	
<i>Camptostoma anomalum</i>	x	C	C	x	x	x	C
<i>Carassius auratus</i>					x	x	
<i>Cyprinella galactura</i>	x	C	C	x	x	x	C
<i>Cyprinella monacha</i>				C	x	x	C
<i>Cyprinella spiloptera</i>		C			x	x	C
<i>Cyprinus carpio</i>					x	x	
<i>Erimystax dissimilis</i>	x		C	x	x		C
<i>Hybopsis amblops</i>	x	C	C	x	x	x	
<i>Luxilus chrysocephalus</i>	x	C		x	x	x	C
<i>Luxilus coccogenis</i>	x	C	C	x	x	x	C
<i>Nocomis micropogon</i>	x	C	C	x	x	x	
<i>Notropis ariommus</i>				x	x	x	
<i>Notropis leuciodus</i>	x			x	x		C
<i>Notropis photogenis</i>		C		x	x	x	C
<i>Notropis rubellus</i>		C	C	x	x	x	C
<i>Notropis cf. spectrunculus</i>		C	C	x	x	x	C
<i>Notropis telescopus</i>	x		C	x	x	x	C
<i>Notropis volucellus</i>					x		
<i>Phenacobius uranops</i>	x		C	x	x	x	C
<i>Pimephales notatus</i>					x		

Scientific Name	RDR 1950s (14)	JC 1954 (1)	RFD 1967 (1)	REJ 1970s (14)	TVA 1970s (18)	NMB 1980s (8)	RLM 1987 (1)
<i>Pimephales vigilax</i>					x		
<i>Rhinichthys atratulus</i>					x		
<i>Semotilus atromaculatus</i>				x	x		
<i>Carpiodes cyprinus</i>					x		
<i>Catostomus commersoni</i>					x		
<i>Hypentelium nigricans</i>	x	C		x	x	x	
<i>Moxostoma duquesnei</i>					x	x	
<i>Moxostoma erythrum</i>		C		x	x	x	
<i>Moxostoma macrolepidotum</i>					x		C
<i>Ameiurus natalis</i>				x	x		
<i>Ictalurus punctatus</i>		C			x		
<i>Noturus eleutherus</i>					x		
<i>Pylodictus olivaris</i>					x		
<i>Fundulus catenatus</i>		C	C	x	x	x	C
<i>Cottus caroliniae</i>	x			x	x		
<i>Ambloplites rupestris</i>	x	C	C	x	x	x	C
<i>Lepomis auritus</i>		C		x	x	x	
<i>Lepomis cyanellus</i>					x		
<i>Lepomis macrochirus</i>					x		
<i>Lepomis megalotis</i>	x	C		x	x	x	
<i>Micropterus dolomieu</i>	x	C	C	x	x	x	

Table B3. (continued) ... North Fork Holston River in Scott County, Virginia.

Scientific Name	RDR 1950s (14)	JC 1954 (1)	RFD 1967 (1)	REJ 1970s (14)	TVA 1970s (18)	NMB 1980s (8)	RLM 1987 (1)
<i>Micropterus salmoides</i>					X		
<i>Pomoxis annularis</i>		C					
<i>Etheostoma blennioides</i>	X			X	X	X	
<i>Etheostoma caeruleum</i>					X	X	
<i>Etheostoma rufilineatum</i>	X	C		X	X	X	C
<i>Etheostoma simoterum</i>	X			X	X	X	

Scientific Name	RDR 1950s (14)	JC 1954 (1)	RFD 1967 (1)	REJ 1970s (14)	TVA 1970s (18)	NMB 1980s (8)	RLM 1987 (1)
<i>Etheostoma vulneratum</i>						X	
<i>Etheostoma zonale</i>				X	X	X	C
<i>Percina aurantiaca</i>				C	X		
<i>Percina burtoni</i>						X	
<i>Percina eides</i>				X	X	X	
<i>Percina macrocephala</i>					X		
<i>Percina sciera</i>					X		

Table B4. North Fork Holston River in Washington County, Virginia. Fifty nominal species and one undescribed taxon of fishes from 89 collections. Number of samples (#) per column are listed. Collections summarized were collected by A.R. Cahn in 1937 (ARC 1937); R.D. Ross in 1953, 1954, 1955, 1956, and 1957 (RDR 1950s); J. Cairns in 1954 (JC 1954); W.S. Woolcott in (WSW 1963); N.M. Burkhead in 1973 (NMB 1973); the Tennessee Valley Authority in 1973, 1974, 1975, and 1976 (TVA 1970s); R.E. Jenkins in 1976 (REJ 1976); C.R. Ciola in 1978 and 1979 (CRC 1970s); N.M. Burkhead in 1981, 1983, and 1984 (NMB 1980s); VPI in 1988 (VPI 1988); R.L. Mayden in 1988 (RLM 1988); and L.M. Page in 1990 (LMP 1990); R.L. Mayden in 1992 (RLM 1992); and P.A. Myer in 1993 (PAM 1993). C= catalogued specimens; x= species reported.

Scientific Name	ARC 1937 (1)	RDR 1950s (35)	JC 1954 (1)	WSW 1963 (1)	NMB 1973 (3)	TVA 1970s (26)	REJ 1976 (1)	CRC 1970s (3)	NMB 1980s (13)	VPI 1988 (1)	RLM 1988 (1)	LMP 1990 (1)	RLM 1992 (1)	PAM 1993 (1)
<i>Camptostoma anomalum</i>	C	x	C	C	x	x	x	C	x	C	C	C	C	C
<i>Cyprinella galactura</i>	C	x	C		x	x	x	C	x	C	C	C	C	
<i>Cyprinella monacha</i>									x	C	C	C		
<i>Cyprinella spiloptera</i>	C					x								
<i>Cyprinus carpio</i>		x	C			x				C				
<i>Erimystax dissimilis</i>					x	x	x		x		C		C	C
<i>Hybopsis amblops</i>	C	x	C	C	x	x			x		C		C	C
<i>Luxilus chrysocephalus</i>	C	x	C		x	x		C	x	C	C	C	C	
<i>Luxilus coccogenis</i>	C	x		C	x	x		C	x	C	C	C		C
<i>Nocomis micropogon</i>	C	x	C	C	x	x			x	C	C	C	C	
<i>Notropis ariommus</i>					x	x		C	x		C	C		
<i>Notropis leuciodus</i>	C	x				x		C	x	C	C	C	C	
<i>Notropis photogenis</i>			C		x	x		C	x		C			
<i>Notropis rubellus</i>		x			x	x	x	C	x		C			

Table B4. (continued) ... North Fork Holston River in Washington County, Virginia.

Scientific Name	ARC 1937 (1)	RDR 1950s (35)	JC 1954 (1)	WSW 1963 (1)	NMB 1973 (3)	TVA 1970s (26)	REJ 1976 (1)	CRC 1970s (3)	NMB 1980s (13)	VPI 1988 (1)	RLM 1988 (1)	LMP 1990 (1)	RLM 1992 (1)	PAM 1993 (1)
<i>Notropis rubricroceus</i>	C	x		C		x								
<i>Notropis cf. spectrunculus</i>			C			x	x	C	x	C	C		C	
<i>Notropis telescopus</i>	C	x			x	x		C	x	C	C	C	C	
<i>Notropis volucellus</i>						x				C		C		
<i>Phenacobius uranops</i>					x	x			x	C	C			C
<i>Rhinichthys atratulus</i>	C					x								
<i>Semotilus atromaculatus</i>						x								
<i>Catostomus commersoni</i>						x								
<i>Hypentelium nigricans</i>		x			x	x	x	C	x			C		
<i>Moxostoma duquesnei</i>						x				C				
<i>Moxostoma erythrurum</i>						x								
<i>Ameiurus natalis</i>					x	x				C		C		
<i>Ictalurus punctatus</i>					x	x				C				
<i>Noturus eleutherus</i>					x	C								
<i>Noturus insignis</i>		C				x			x	C			C	C
<i>Pylodictus olivaris</i>					x	x								
<i>Oncorhynchus mykiss</i>						x								
<i>Fundulus catenatus</i>	C	x			x	x			x	C	C			
<i>Cottus carolinae</i>		x		C	x	x		C	x	C			C	
<i>Ambloplites rupestris</i>	x	C	C	C	x	x		C	x	C		C		

Table B4. (continued) ... North Fork Holston River in Washington County, Virginia.

Scientific Name	ARC 1937 (1)	RDR 1950s (35)	JC 1954 (1)	WSW 1963 (1)	NMB 1973 (3)	TVA 1970s (26)	REJ 1976 (1)	CRC 1970s (3)	NMB 1980s (13)	VPI 1988 (1)	RLM 1988 (1)	LMP 1990 (1)	RLM 1992 (1)	PAM 1993 (1)
<i>Lepomis auritus</i>					X	X			X	C				
<i>Lepomis cyanellus</i>				C										
<i>Lepomis macrochirus</i>						X								
<i>Lepomis megalotis</i>	C	X	C		X	X		C		C				
<i>Micropterus dolomieu</i>	C	X	C		X	X	X	C	X	C			C	
<i>Micropterus salmoides</i>						X								
<i>Etheostoma blennioides</i>		X	C		X	X		C	X	C		C	C	C
<i>Etheostoma camurum</i>						X				C				
<i>Etheostoma flabellare</i>						X								
<i>Etheostoma rufilineatum</i>		X			X	X	X	C	X	C	C	C	C	C
<i>Etheostoma simoterum</i>		X			X	X		C					C	
<i>Etheostoma vulneratum</i>						X								C
<i>Etheostoma zonale</i>					X	X		C	X	C	C		C	C
<i>Percina aurantiaca</i>						X			X	C				
<i>Percina burtoni</i>						X			X					C
<i>Percina evides</i>					X	X	X		X	C		C		
<i>Percina macrocephala</i>						X								

Table B5. North Fork Holston River in Smyth County, Virginia. Sixty-three nominal species and one undescribed taxon from 44+ samples. Number of samples (#) per column are listed. Collections summarized were collected by E.D. Cope in 1867 (EDC 1867); D.S. Jordan in 1888 (DSJ 1888); H.R. Becker in 1928 (HRB 1928); G.S. Myers in 1933 (GSM 1933); E.A. Lachner in 1940 (EAL 1940); E.C. Raney in 1951 (ECR 1951); R.D. Ross in 1954, 1955, 1956 and 1958 (RDR 1950s); J. Cairns in 1954 (JC 1954); C.R. Gilbert in 1954 (C.R. Gilbert 1954); W.S. Woolcott in 1958 (WSW 1958); W.J. Richards in 1961 (WJR 1961); R.E. Jenkins in 1963 (REJ 1963); R.F. Denoncourt in 1967 (RFD 1967); R.E. Jenkins in 1970 and 1973 (REJ 1970s); J.R. Reed in 1973 (JRR 1973); the Tennessee Valley Authority (TVA 1970s); J.C. Widlak in 1981, 1982 (JCW 1980s); Virginia Polytechnical Institute (VPI 1988).

C= catalogued specimens; x= species reported; "C"= catalogued specimen with questionable locality data.

Scientific Name	EDC 1867 (1+)	DSJ 1888 (1)	HRB 1928 (1)	GSM 1933 (1)	EAL 1940 (1)	ECR 1951 (1)	RDR 1950s (12)	JC 1954 (1)	CRG 1954 (1)	WSW 1958 (2)	WJR 1961 (1)	REJ 1963 (2)	RFD 1967 (1)	REJ 1970s (2)	JRR 1973 (1)	TVA 1970s (13)	JCW 1980s (1+)	VPI 1988 (1)
<i>Ichthyomyzon bdellium</i>	x		C				C									x	x	
<i>Ichthyomyzon greeleyi</i>																		C
<i>Lampetra appendix</i>																x		
<i>Lepisosteus osseus</i>	x																	
<i>Dorosoma cepedianum</i>																x		
<i>Campostoma anomalum</i>	x	x	C	C	C		x	C	C	C		x	C	x	x	x	x	C
<i>Cyprinella galactura</i>	C	x	C		C	C	x	C	C	C		x	C	x	x	x	x	C
<i>Cyprinella monacha</i>	C	x						C										
<i>Cyprinella spiloptera</i>																x		
<i>Erimystax dissimilis</i>		x	C				x								x	x	x	
<i>Hybopsis amblops</i>	x	x	C	C			x	C		C		x	C	x	x	x		C
<i>Luxilus chrysocephalus</i>	x	x	C	C	C		x	C	C	C	C	x	C	x	x	x	x	C
<i>Luxilus coccogenis</i>	C	x	C	C		C	x	C	C	C	C	x	C	x		x	x	C
<i>Nocomis micropogon</i>	x	x	C	C	C	C	x	C	C	C	C	x	C	x	x	x	x	C
<i>Notropis ariommus</i>																x	x	
<i>Notropis leuciodus</i>	C	x	C		C	C	x	C	C	C		x	C	x	x	x	x	C
<i>Notropis photogenis</i>		x					x	C					C	x	x	x	x	
<i>Notropis rubellus</i>	C		C			C	x	C			C		C	x	x	x	x	
<i>Notropis rubricroceus</i>	C						x			C		x				x	x	C
<i>Notropis cf. spectrunculus</i>		x	C			C		C						x		x		

Table B5. (continued) ... North Fork Holston River in Smyth County, Virginia.

Scientific Name	EDC 1867 (1+)	DSJ 1888 (1)	HRB 1928 (1)	GSM 1933 (1)	EAL 1940 (1)	ECR 1951 (1)	RDR 1950s (12)	JC 1954 (1)	CRG 1954 (1)	WSW 1958 (2)	WJR 1961 (1)	REJ 1963 (2)	RFD 1967 (1)	REJ 1973 (1)	JRR 1973 (1)	TVA 1970s (13)	JCW 1980s (1+)	VPI 1988 (1)
<i>Notropis telescopus</i>	C	x	C		C	C	x	C	C	C		x	C	x	x	x	x	C
<i>Notropis volucellus</i>		x	C													x		
<i>Phenacobius uranops</i>	x	x	C			C	x	C		C			C	x	x	x	x	
<i>Pimephales notatus</i>																x		
<i>Rhinichthys atratulus</i>												x				x	x	C
<i>Semotilus atromaculatus</i>	x															x	x	
<i>Catostomus commersoni</i>	x													x		x	x	C
<i>Hypentelium nigricans</i>	x		C		C	C	x	C				x	C	x	x	x	x	C
<i>Moxostoma duquesnei</i>	x		C				C			C		C	C		x	x		
<i>Moxostoma erythrum</i>	x	x	C	C	C		C	C			C					x	x	
<i>Moxostoma lacerum</i>		C																
<i>Moxostoma macrolepidotum</i>																x		
<i>Ameiurus natalis</i>																	x	
<i>Ameiurus nebulosus</i>																	x	
<i>Ictalurus punctatus</i>																x		
<i>Noturus eleutherus</i>																x		
<i>Noturus flavipinnis</i>		C																
<i>Noturus insignis</i>						C	x						C	x	x	x	x	
<i>Pylodictus olivaris</i>																x		
<i>Esox masquinongy</i>																x		
<i>Oncorhynchus mykiss</i>												x						
<i>Salvelinus fontinalis</i>																x		
<i>Fundulus catenatus</i>	x	x	C				x			C				x		x		
<i>Cottus carolinae</i>			C		C					C		x	C	x	x	x	x	C
<i>Ambloplites rupestris</i>	x		C				x	C		C	C	x	C	x	x	x	x	C
<i>Lepomis auritus</i>														x		x	x	

Table B5. (continued) ... North Fork Holston River in Smyth County, Virginia.

Scientific Name	EDC 1867 (1+)	DSJ 1888 (1)	HRB 1928 (1)	GSM 1933 (1)	EAL 1940 (1)	ECR 1951 (1)	RDR 1950s (12)	JC 1954 (1)	CRG 1954 (1)	WSW 1958 (2)	WJR 1961 (1)	REJ 1963 (2)	RFD 1967 (1)	REJ 1973 (1)	JRR 1973 (1)	TVA 1970s (13)	JCW 1980s (1+)	VPI 1988 (1)
<i>Lepomis macrochirus</i>																X	X	C
<i>Lepomis megalotis</i>	X	X	C				X	C						X		X	X	
<i>Micropterus dolomieu</i>	X	X	C				X	C		C	C	X	C	X		X	X	C
<i>Micropterus salmoides</i>																X	X	
<i>Pomoxis nigromaculatus</i>																X	X	
<i>Etheostoma blennioides</i>	X	X	C		C	C	C	C	C			X	C	X	X	X	X	
<i>Etheostoma camurum</i>						C		C					C	X		X	X	
<i>Etheostoma flabellare</i>	X	C										X	C					
<i>Etheostoma rufilineatum</i>		X	C		C	C	X	C	C	C		X	C	X	X	X	X	C
<i>Etheostoma simoterum</i>	C	C	C		C		X		C	C		X	C	X		X	X	C
<i>Etheostoma spectabile</i>			"C"															
<i>Etheostoma vulneratum</i>			C		C								C	X	X	X	X	
<i>Etheostoma zonale</i>	C	C	C			C		C	C	C			C	X	X	X	X	
<i>Percina aurantiaca</i>	C	X														X	X	
<i>Percina burtoni</i>	C	X				C				X						C		
<i>Percina caprodes</i>			C											X		X	X	
<i>Percina macrocephala</i>		X	C												X	X	X	
<i>Percina maculata</i>			"C"															

Table B6. North Fork Holston River in Bland County, Virginia. Twelve nominal species of fish from 5 samples. Number of samples (#) are listed. Collections summarized were collected by E.D. Reid in 1933 (EDR 1933), R.D. Ross in 1956 (RDR 1956), and P.A. Myer in 1993 (PAM 1993). C= catalogued specimens; x= species reported.

Scientific Name	EDR 1933 (1)	RDR 1956 (3)	PAM 1993 (1)
<i>Campostoma anomalum</i>		x	
<i>Luxilus chrysocephalus</i>	C	x	
<i>Luxilus coccogenis</i>		x	
<i>Nocomis micropogon</i>		x	
<i>Notropis rubricroceus</i>			C
<i>Rhinichthys atratulus</i>	C	x	
<i>Semotilus atromaculatus</i>	C		
<i>Hypentelium nigricans</i>		x	
<i>Cottus baileyi</i>	C		
<i>Cottus carolinae</i>		x	
<i>Etheostoma rufilineatum</i>		x	
<i>Etheostoma simoterum</i>	C	x	C

APPENDIX C

Table C1. Collection summary of the South Fork Holston River. Scientific names of 76 nominal species of fishes and 2 undescribed taxa taken from 1888 to 1993 in 103 collections. Number of samples (#) per column listed. Data reported in columns, progressing upstream from left to right by counties of Tennessee (TN) and Virginia (VA). From Sullivan County in the vicinity of Kingsport (Kings) or near South Holston Dam (Dam); and from Washington (Wash), and Smyth (Smyth) counties. C= catalogued specimens; x= species reported.

Scientific Name	Kings TN (18)	Dam TN (18)	Wash VA (38)	Smyth VA (29)
<i>Lampetra appendix</i>				C
<i>Dorosoma cepedianum</i>	C	x	C	
<i>Dorosoma petenense</i>			x	
<i>Campostoma anomalum</i>	C	C	C	C
<i>Cyprinella galactura</i>	C	C	C	x
<i>Cyprinella monacha</i>		C		x
<i>Cyprinella spiloptera</i>			C	
<i>Cyprinus carpio</i>	C	x	x	
<i>Erimystax dissimilis</i>	C	C		
<i>Erimystax insignis</i>		C	C	
<i>Hybopsis amblops</i>	C	C	C	C
<i>Luxilus chrysocephalus</i>	C	C	C	x
<i>Luxilus coccogenis</i>	C	C	C	x
<i>Nocomis micropogon</i>	C	C	C	C
<i>Notemigonus crysoleucas</i>			C	x
<i>Notropis leuciodus</i>	C	C	C	C
<i>Notropis photogenis</i>	C	C	C	
<i>Notropis rubellus</i>	C	C	C	x
<i>Notropis rubricroceus</i>		C	C	C
<i>Notropis spectrunculus</i>			C	C

Scientific Name	Kings TN (18)	Dam TN (18)	Wash VA (38)	Smyth VA (29)
<i>Notropis cf. spectrunculus</i>	C	C		
<i>Notropis telescopus</i>	C	C	C	C
<i>Notropis volucellus</i>		C	C	
<i>Phenacobius crassilabrum</i>		C	C	
<i>Phenacobius uranops</i>		C	C	
<i>Pimephales notatus</i>		C	C	
<i>Pimephales promelas</i>			C	x
<i>Rhinichthys atratulus</i>	C	x	C	C
<i>Rhinichthys cataractae</i>		x	C	x
<i>Semotilus atromaculatus</i>			x	C
<i>Carpionodes carpio</i>	C			
<i>Catostomus commersoni</i>	C		C	C
<i>Hypentelium nigricans</i>	C	C	C	C
<i>Moxostoma anisurum</i>		C		
<i>Moxostoma carinatum</i>		C	x	
<i>Moxostoma duquesnei</i>	C	C	C	x
<i>Moxostoma erythrurum</i>	C	C	C	x
<i>Moxostoma macrolepidotum</i>		C	x	
<i>Ameiurus natalis</i>	C			
<i>Ictalurus punctatus</i>			x	x

Table C1. (continued) ... Collection summary of the South Fork Holston River.

Scientific Name	Kings TN (18)	Dam TN (18)	Wash VA (38)	Smyth VA (29)
<i>Noturus eleutherus</i>		C		
<i>Noturus flavus</i>		C	C	
<i>Pylodictus olivaris</i>	C			
<i>Esox lucius</i>			C	
<i>Esox masquinongy</i>				x
<i>Oncorhynchus mykiss</i>	C	x	C	C
<i>Salmo trutta</i>		x	C	x
<i>Salvelinus fontinalis</i>				x
<i>Gambusia affinis</i>	C			
<i>Cottus baileyi</i>				C
<i>Cottus cf. bairdi</i>		C	C	C
<i>Cottus carolinae</i>	C	x	C	C
<i>Ambloplites rupestris</i>	C	C	C	C
<i>Lepomis auritus</i>	C			x
<i>Lepomis cyanellus</i>		x		
<i>Lepomis gibbosus</i>			C	x
<i>Lepomis gulosus</i>		C	x	
<i>Lepomis macrochirus</i>	C	C	C	x
<i>Lepomis megalotis</i>		x		
<i>Lepomis microlophus</i>	C			
<i>Micropterus dolomieu</i>	C	C	C	x

Scientific Name	Kings TN (18)	Dam TN (18)	Wash VA (38)	Smyth VA (29)
<i>Micropterus punctulatus</i>	C			
<i>Micropterus salmoides</i>	C	x	x	x
<i>Pomoxis nigromaculatus</i>		x		x
<i>Etheostoma acuticeps</i>		C	C	
<i>Etheostoma blennioides</i>	C	C	C	
<i>Etheostoma camurum</i>		C		
<i>Etheostoma flabellare</i>		C	C	C
<i>Etheostoma percnurum</i>		C		
<i>Etheostoma rufilineatum</i>	C	C	C	C
<i>Etheostoma simoterum</i>	C	C	C	C
<i>Etheostoma swannanoa</i>			x	C
<i>Etheostoma vulneratum</i>		C	C	
<i>Etheostoma zonale</i>	C	C	C	
<i>Percina aurantiaca</i>			C	
<i>Percina burtoni</i>		C		
<i>Percina caprodes</i>	C	x	C	
<i>Percina evides</i>		C	C	
<i>Percina macrocephala</i>		C		

Table C2. South Fork Holston River at Kingsport in Sullivan County, Tennessee. Thirty-six nominal species and one undescribed taxon collected in 18 samples. Number of samples (#) per column are listed. Collections summarized were collected by the Academy of Natural Sciences of Philadelphia in 1965, 1974, 1980, and 1990 (ANSP 1965, 1974, 1980, and 1990); and J.L. Wilson in 1989 and 1991 (JLW 1989, 1991). C= catalogued specimens; x= species reported.

Scientific Name	ANSP 1965 (3)	ANSP 1974 (4)	ANSP 1980 (5)	ANSP 1990 (4)	JLW 1989 (1)	JLW 1991 (1)
<i>Dorosoma cepedianum</i>			C			
<i>Camptostoma anomalum</i>	C	C	C	C		x
<i>Cyprinella galactura</i>		C	C	C		x
<i>Cyprinus carpio</i>	C					
<i>Erimystax dissimilis</i>		C				
<i>Hybopsis amblops</i>		C				x
<i>Luxilus chrysocephalus</i>	C	C	C			x
<i>Luxilus coccogenis</i>		C	C			x
<i>Nocomis micropogon</i>	C	C	C			
<i>Notropis leuciodus</i>			C			x
<i>Notropis photogenis</i>			C			x
<i>Notropis rubellus</i>		C	C			
<i>Notropis cf. spectrunculus</i>		C	C			x
<i>Notropis telescopus</i>			C	C		x
<i>Rhinichthys atratulus</i>		C				
<i>Carpiodes carpio</i>				C	C	
<i>Catostomus commersoni</i>		C	C		C	
<i>Hypentelium nigricans</i>	C	C	C	C		x
<i>Moxostoma duquesnei</i>		C	C		C	
<i>Moxostoma erythrurum</i>					C	
<i>Ameiurus natalis</i>	C	C	C			x
<i>Pylodictus olivaris</i>		C				
<i>Oncorhynchus mykiss</i>	C					

Scientific Name	ANSP 1965 (3)	ANSP 1974 (4)	ANSP 1980 (5)	ANSP 1990 (4)	JLW 1989 (1)	JLW 1991 (1)
<i>Gambusia affinis</i>	C	C		C		
<i>Cottus caroliniae</i>	C	C	C	C		
<i>Ambloplites rupestris</i>		C	C			x
<i>Lepomis auritus</i>	C	C	C	C		x
<i>Lepomis macrochirus</i>	C		C			
<i>Lepomis microlophus</i>				C		
<i>Micropterus dolomieu</i>		C	C	C		
<i>Micropterus punctulatus</i>	C					x
<i>Micropterus salmoides</i>			C			x
<i>Etheostoma blennioides</i>			C	C		
<i>Etheostoma rufilelineatum</i>				C		C
<i>Etheostoma simoterum</i>	C	C	C	C		x
<i>Etheostoma zonale</i>			C			
<i>Percina caprodes</i>	C					

Table C3. South Fork Holston River in Sullivan County, Tennessee. Fifty-four nominal species of fishes and two undescribed taxa collected in 18 samples from the lotic waters between the headwaters of Boone Lake (SFHR mile 56.0) and the Virginia state border. Number of samples (#) per column are listed. Collections summarized in columns were taken by J.G. Carlson in 1930 (JGC 1930); R.M. Bailey in 1947 and 1949 (RMB 1940s); the Tennessee Game and Fish Commission in 1953 and 1955 (TGFC 1950s); N.M. Burkhead in 1972 (NMB 1972); the Tennessee Valley Authority in 1973 (TVA 1973); and M.H. Hughes in 1992 (MHH 1992).

C= catalogued specimens; x= species reported; ?= questionable identification [Fowler (1930) identified Carlson's specimens as *Phenacobius uranops*, but may have been *Phenacobius crassilabrum* (Jenkins, in litt.)].

Scientific Name	JGC 1930 (3)	RMB 1940s (5)	TGFC 1950s (3)	NMB 1972 (1)	TVA 1973 (3)	MHH 1992 (3)
<i>Dorosoma cepedianum</i>			x		x	
<i>Camptostoma anomalum</i>	x	C	x			
<i>Cyprinella galactura</i>		C				
<i>Cyprinella monacha</i>		C				
<i>Cyprinus carpio</i>			x			
<i>Erimystax dissimilis</i>		C				
<i>Erimystax insignis</i>		C				
<i>Hybopsis amblops</i>		C				
<i>Luxilus chrysocephalus</i>		C			x	
<i>Luxilus coccogenis</i>		C	x			
<i>Nocomis micropogon</i>		C	x			
<i>Notropis leuciodus</i>		C				
<i>Notropis photogenis</i>		C	x			
<i>Notropis rubellus</i>		C				
<i>Notropis rubricroceus</i>		C				
<i>Notropis cf. spectrunculus</i>		C				
<i>Notropis telescopus</i>	x	C				
<i>Notropis volucellus</i>		C				
<i>Phenacobius crassilabrum</i>	?	C				
<i>Phenacobius uranops</i>	?	C				
<i>Pimephales notatus</i>		C				

Scientific Name	JGC 1930 (3)	RMB 1940s (5)	TGFC 1950s (3)	NMB 1972 (1)	TVA 1973 (3)	MHH 1992 (3)
<i>Rhinichthys atratulus</i>			x			
<i>Rhinichthys cataractae</i>			x			
<i>Hypentelium nigricans</i>	x	C	x			
<i>Moxostoma anisurum</i>		C				
<i>Moxostoma carinatum</i>		C	x			
<i>Moxostoma duquesnei</i>	C	C				
<i>Moxostoma erythrum</i>		C				
<i>Moxostoma macrolepidotum</i>		C	x			
<i>Noturus eleutherus</i>	C	C				
<i>Noturus flavus</i>		C	x			
<i>Oncorhynchus mykiss</i>			x		x	
<i>Salmo trutta</i>				x	x	x
<i>Cottus cf. bairdi</i>		C				
<i>Cottus carolinae</i>			x	x	x	x
<i>Ambloplites rupestris</i>		C	x			
<i>Lepomis cyanellus</i>					x	
<i>Lepomis gulosus</i>		C	x			
<i>Lepomis macrochirus</i>		C	x		x	x
<i>Lepomis megalotis</i>			x			
<i>Micropterus dolomieu</i>		C	x			
<i>Micropterus salmoides</i>					x	x

Table C3. (continued) ... South Fork Holston River in Sullivan County, Tennessee.

Scientific Name	JGC 1930 (3)	RMB 1940s (5)	TGFC 1950s (3)	NMB 1972 (1)	TVA 1973 (3)	MHH 1992 (3)
<i>Pomoxis nigromaculatus</i>			x			
<i>Etheostoma acuticeps</i>	C	C				
<i>Etheostoma blennioides</i>	x	C				
<i>Etheostoma caeruleum</i>		C	x			
<i>Etheostoma flabellare</i>		C				
<i>Etheostoma percnurum</i>		C				
<i>Etheostoma rufilineatum</i>		C				

Scientific Name	JGC 1930 (3)	RMB 1940s (5)	TGFC 1950s (3)	NMB 1972 (1)	TVA 1973 (3)	MHH 1992 (3)
<i>Etheostoma simoterum</i>	x	C				
<i>Etheostoma vulneratum</i>	C	C				
<i>Etheostoma zonale</i>	C	C	x			
<i>Percina burtoni</i>		C	x			
<i>Percina caprodes</i>					x	x
<i>Percina evides</i>		C				
<i>Percina macrocephala</i>		C				

Table C4. South Fork Holston River in Washington County, Virginia. Fifty-five nominal species and one undescribed taxon collected in 38 samples. Number of samples (#) per column are listed. Collections summarized in columns were taken by R.M. Bailey in 1947 (RMB 1947); W.R. Taylor in 1959 (WRT 1959); R.D. Suttkus in 1964 (RDS 1964); R.F. Denoncourt in 1967 (RFD 1967); T. Zorach in 1968 (TZ 1968); D.A. Etnier in 1970 (DAE 1970); R.E. Jenkins in 1970 (REJ 1970); R.E. Wollitz in 1970 (REW 1970); R.C. Cashner in 1971 (RCC 1971); N.M. Burkhead in 1971, 1972, and 1973 (NMB 1970s); the Tennessee Valley Authority in 1973 (TVA 1973); the Academy of Natural Sciences of Philadelphia in 1980 (ANSP 1980); N.M. Burkhead in 1983 and 1984 (NMB 1980s); W.H. Haxo in 1984 (WHH 1984); Virginia Polytechnic Institute in 1987 (VPI 1987); and the Tennessee Valley Authority in 1988 (TVA 1988).
C= catalogued specimens; x= species reported.

Scientific Name	RMB 1947 (1)	WRT 1959 (1)	RDS 1964 (1)	RFD 1967 (3)	TZ 1968 (1)	DAE 1970 (2)	REJ 1970 (1)	REW 1970 (3)	RCC 1971 (1)	NMB 1970s (9)	TVA 1973 (1)	ANSP 1980 (1)	NMB 1980s (2)	WHH 1984 (9)	VPI 1987 (1)	TVA 1988 (1)
<i>Dorosoma cepedianum</i>					x	x	x	x		x	x	C	x	x		
<i>Dorosoma petenense</i>											x					
<i>Campostoma anomalum</i>	C		C	C	x	x	x		C	x	x	C	x	x	C	x
<i>Cyprinella galactura</i>	C		C	C		x	x		C	x	x	C		x		
<i>Cyprinella spiloptera</i>	C		C			x			C	x						x
<i>Cyprinus carpio</i>								x								x
<i>Erimystax insignis</i>			C			x							x	x		
<i>Hybopsis amblops</i>	C		C	C	x	x			C	x	x	C			C	x
<i>Luxilus chrysocephalus</i>	C		C	C	x		x		C	x	x			x		x
<i>Luxilus coccogenis</i>	C		C	C		x	x		C	x	x	C	x	x		x
<i>Nocomis micropogon</i>	C		C		x	x	x		C	x	x	C	x	x	C	x
<i>Notemigonus crysoleucas</i>															C	
<i>Notropis leuciodus</i>	C		C	C	x	x	x		C	x	x	C	x	x		x
<i>Notropis photogenis</i>			C			x						C		x		
<i>Notropis rubellus</i>															C	
<i>Notropis rubricroceus</i>				C						x	x		x		C	
<i>Notropis spectrunculus</i>											x				C	
<i>Notropis telescopus</i>	C		C	C	x	x			C	x	x	C	x	x	C	x
<i>Notropis volucellus</i>	C															
<i>Phenacobius crassilabrum</i>			C	C		C	x		C	x	x	C	x	x		x

Table C4. (continued)...SFHR, Washington County, Virginia.

Scientific Name	RMB 1947 (1)	WRT 1959 (1)	RDS 1964 (1)	RFD 1967 (3)	TZ 1968 (1)	DAE 1970 (2)	REJ 1970 (1)	REW 1970 (3)	RCC 1971 (1)	NMB 1970s (9)	TVA 1973 (1)	ANSP 1980 (1)	NMB 1980s (2)	WHH 1984 (9)	VPI 1987 (1)	TVA 1988 (1)
<i>Phenacobius uranops</i>			C	C					C							
<i>Pimephales notatus</i>			C	C	x	x	x		C	x	x					
<i>Pimephales promelas</i>															C	x
<i>Rhinichthys atratulus</i>										x	x		x		C	
<i>Rhinichthys cataractae</i>						x	x			x	x		x		C	x
<i>Semotilus atromaculatus</i>					x						x			x		x
<i>Catostomus commersoni</i>								x		x	x			x	C	x
<i>Hypentelium nigricans</i>	C		C	C	x	x	x	x	C	x	x	C	x	x	C	x
<i>Moxostoma carinatum</i>								x			x					x
<i>Moxostoma duquesnei</i>	C		C		x	x		x	C	x	x		x			x
<i>Moxostoma erythrurum</i>	C									x	x					x
<i>Moxostoma macrolepidotum</i>								x			x					x
<i>Ictalurus punctatus</i>								x			x			x		x
<i>Noturus flavus</i>		C														
<i>Esox lucius</i>															C	
<i>Oncorhynchus mykiss</i>											x			x	C	
<i>Salmo trutta</i>											x				C	x
<i>Cottus cf bairdi</i>	C		C	C					C	x	x		x	x	C	x
<i>Cottus caroliniae</i>	C		C	C	x	x			C	x	x	C	x	x	C	x
<i>Ambloplites rupestris</i>	C		C					x	C	x	x	C	x		C	x
<i>Lepomis gibbosus</i>								x							C	x
<i>Lepomis gulosus</i>																x
<i>Lepomis macrochirus</i>						x		x	C	x	x	C			C	x
<i>Micropterus dolomieu</i>	C			C		x	x	x	C	x	x		x		C	x
<i>Micropterus salmoides</i>																x

Table C4. (continued)...SFHR, Washington County, Virginia.

Scientific Name	RMB 1947 (1)	WRT 1959 (1)	RDS 1964 (1)	RFD 1967 (3)	TZ 1968 (1)	DAE 1970 (2)	REJ 1970 (1)	REW 1970 (3)	RCC 1971 (1)	NMB 1970s (9)	TVA 1973 (1)	ANSP 1980 (1)	NMB 1980s (2)	WHH 1984 (9)	VPI 1987 (1)	TVA 1988 (1)
<i>Etheostoma acuticeps</i>										C			x	x		x
<i>Etheostoma blennioides</i>	C		C	C		x	x		C	x	x		x	x		x
<i>Etheostoma flabellare</i>										x	x		x		C	
<i>Etheostoma rufileatum</i>	C		C	C	x	x	x		C	x	x	C	x	x		x
<i>Etheostoma simoterum</i>	C		C	C	x	x	x		C	x	x	C	x	x	C	x
<i>Etheostoma swannanoa</i>					x					x	x		x	x		
<i>Etheostoma vulneratum</i>	C		C	C			x		C	x			x	x		x
<i>Etheostoma zonale</i>	C		C	C		x	x			x	x		x	x		x
<i>Percina aurantiaca</i>						C										
<i>Percina caprodes</i>			C	C		C	x		C	x	x	C	x	x		x
<i>Percina evides</i>			C	C		x				x						

Table C5. South Fork Holston River in Smyth County, Virginia. Forty nominal species and one undescribed taxon from 29 samples. Number of samples (#) per column are listed. Collections summarized in columns were taken by D.S. Jordan in 1888 (DSJ 1888); E.C. Raney in 1951 (ECR 1951); R.D. Ross in 1951, 1952, 1954, and 1958 (RDR 1950s); C.R. Gilbert in 1954 (CRG 1954); W.P. Davis in 1961 (WPD 1961); the Tennessee Valley Authority in 1973 (TVA 1973); T.M. Cavender in 1976 (TMC 1976); C.R. Ciola in 1979 (CRC 1979); W.R. Whitworth in 1979 (WRW 1979); N.M. Burkhead in 1984 (NMB 1984); and B.R. Kuhajda in 1992 (BRK 1992).
C= catalogued specimens; x= species reported.

Scientific Name	DSJ 1888 (1)	ECR 1951 (1)	RDR 1950s (13)	CRG 1954 (2)	WPD 1961 (3)	TVA 1973 (1)	TMC 1976 (2)	CRC 1979 (1)	WRW 1979 (1)	NMB 1984 (3)	BRK 1992 (1)
<i>Lampetra appendix</i>							C				
<i>Camptostoma anomalum</i>	x		x	C	C	x	C	C	x	x	C
<i>Cyprinella galactura</i>	x		x								
<i>Cyprinella monacha</i>			x			x					
<i>Hybopsis amblops</i>	C		x								
<i>Luxilus chrysocephalus</i>	x		x								
<i>Luxilus coccogenis</i>	x		x								
<i>Nocomis micropogon</i>	x	C	x								
<i>Notemigonus crysoleucas</i>						x			x	x	
<i>Notropis leuciodus</i>	x	C	x								
<i>Notropis rubellus</i>			x								
<i>Notropis rubricroceus</i>	C	C	x	C			C		x	x	C
<i>Notropis spectrunculus</i>	C		x	C					x		
<i>Notropis telescopus</i>	x		x	C	C						C
<i>Pinephales promelas</i>						x					
<i>Rhinichthys atratulus</i>	x		x	C	C		C		x	x	C
<i>Rhinichthys cataractae</i>	x										
<i>Semotilus atromaculatus</i>							C				
<i>Catostomus commersoni</i>	x					x	C			x	
<i>Hypentelium nigricans</i>	x		x			x				x	C
<i>Moxostoma duquesnei</i>			x			x					
<i>Moxostoma erythrurum</i>						x					

Table C5. (continued) South Fork Holston River in Smyth County, Virginia.

Scientific Name	DSJ 1888 (1)	ECR 1951 (1)	RDR 1950s (13)	CRG 1954 (2)	WPD 1961 (3)	TVA 1973 (1)	TMC 1976 (2)	CRC 1979 (1)	WRW 1979 (1)	NMB 1984 (3)	BRK 1992 (1)
<i>Ictalurus punctatus</i>						x					
<i>Esox masquinongy</i>						x					
<i>Oncorhynchus mykiss</i>	x		x		C	x				x	C
<i>Salmo trutta</i>						x				x	
<i>Salvelinus fontinalis</i>	x		x								
<i>Cottus baileyi</i>							C	C		x	
<i>Cottus cf. bairdi</i>		C		C	C		C			x	
<i>Cottus carolinae</i>	C	C	x	C	C	x	C				C
<i>Ambloplites rupestris</i>	x		x			x					C
<i>Lepomis auritus</i>						x					
<i>Lepomis gibbosus</i>			x			x				x	
<i>Lepomis macrochirus</i>			x			x				x	
<i>Micropterus dolomieu</i>			x			x					
<i>Micropterus salmoides</i>						x				x	
<i>Pomoxis nigromaculatus</i>			x								
<i>Etheostoma flabellare</i>	x	C		C	C	x				x	C
<i>Etheostoma rufileatum</i>	C	C			C	x					C
<i>Etheostoma simoterum</i>	x	C	x	C	C	x	C	C	x	x	C
<i>Etheostoma swainsona</i>	x	C	x		C	x			x		

APPENDIX D

Table D1. Collection summary of the Middle Fork Holston River. Fifty-six nominal species and 2 undescribed taxa from 59 samples. Number of samples (#) per county (column) are listed. Data reported in sections (columns) moving upstream from left to right by counties Washington (Wash) and Smyth (Smyth) counties of Virginia (VA). C= catalogued specimens; x= species reported.

Scientific Name	VA Wash (19)	VA Smyth (40)
<i>Icthyomyzon greeleyi</i>		x
<i>Dorosoma cepedianum</i>	x	
<i>Camptostoma anomalum</i>	C	C
<i>Cyprinella galactura</i>	C	C
<i>Cyprinella monacha</i>	C	
<i>Cyprinella spiloptera</i>	C	C
<i>Cyprinus carpio</i>	x	x
<i>Erimystax dissimilis</i>	C	C
<i>Hybopsis amblops</i>	C	C
<i>Luxilus chrysocephalus</i>	C	C
<i>Luxilus coccogenis</i>	C	C
<i>Nocomis micropogon</i>	x	C
<i>Notemigonus crysoleucas</i>	x	C
<i>Notropis leuciodus</i>	C	C
<i>Notropis photogenis</i>	C	C
<i>Notropis rubellus</i>	C	C
<i>Notropis rubricroceus</i>	C	C
<i>Notropis spectrunculus</i>	C	C
<i>Notropis cf. spectrunculus</i>	C	C
<i>Notropis stramineus</i>		x
<i>Notropis telescopus</i>	C	C

Scientific Name	VA Wash (19)	VA Smyth (40)
<i>Notropis volucellus</i>	C	
<i>Phenacobius uranops</i>	C	x
<i>Pimephales notatus</i>	C	x
<i>Rhinichthys atratulus</i>	x	C
<i>Semotilus atromaculatus</i>	x	C
<i>Catostomus commersoni</i>	C	C
<i>Hypentelium nigricans</i>	C	C
<i>Moxostoma carinatum</i>	x	
<i>Moxostoma duquesnei</i>	x	C
<i>Moxostoma erythrurum</i>	C	C
<i>Moxostoma macrolepidotum</i>	x	
<i>Ameiurus natalis</i>	x	C
<i>Ictalurus punctatus</i>	x	
<i>Pylodictus olivaris</i>	x	
<i>Oncorhynchus mykiss</i>		x
<i>Salmo trutta</i>		x
<i>Cottus baileyi</i>	C	C
<i>Cottus cf. bairdi</i>	x	C
<i>Cottus caroliniae</i>	C	C
<i>Ambloplites rupestris</i>	C	C
<i>Lepomis auritus</i>	x	C

Scientific Name	VA Wash (19)	VA Smyth (40)
<i>Lepomis cyanellus</i>	x	x
<i>Lepomis gibbosus</i>	x	x
<i>Lepomis macrochirus</i>	C	C
<i>Lepomis megalotis</i>	x	x
<i>Micropterus dolomieu</i>	C	x
<i>Micropterus salmoides</i>	x	
<i>Pomoxis nigromaculatus</i>	x	x
<i>Etheostoma blennioides</i>	C	C
<i>Etheostoma flabellare</i>	x	C
<i>Etheostoma rufilineatum</i>	C	C
<i>Etheostoma simoterum</i>	C	C
<i>Etheostoma swannanoa</i>		C
<i>Etheostoma vulneratum</i>	x	
<i>Etheostoma zonale</i>	C	C
<i>Percina caprodes</i>	x	
<i>Percina macrocephala</i>	C	

Table D2. Middle Fork Holston River in Washington County, Virginia. Fifty-four nominal fish species and two undescribed taxa from 19 samples. Number of samples (#) per column are listed. Collections summarized in columns were collected by M.C. McDonald in 1885 (MCM 1885); D.S. Jordan in 1888 (DSJ 1888); L.P. Schultz in 1937 (LPS 1937); R.E. Jenkins in 1967 (REJ 1967); R.E. Wollitz in 1969 (REW 1969); N.M. Burkhead in 1972 (NMB 1972); the Tennessee Valley Authority in 1973 (TVA 1973); W.H. Haxo in 1984 (WHH 1984); R.E. Jenkins in 1986 (REJ 1986); the Tennessee Valley Authority in 1986 and 1988 (TVA 1980s); M.H. Hughes in 1993 (MHH 1993).
C= catalogued specimens; x= species reported.

Scientific Name	MCM 1885 (1)	DSJ 1888 (1)	LPS 1937 (1)	REJ 1967 (1)	REW 1969 (2)	NMB 1972 (2)	TVA 1973 (1)	WHH 1984 (3)	REJ 1986 (2)	TVA 1980s (4)	MHH 1993 (1)
<i>Dorosoma cepedianum</i>				x	x	x	x			x	
<i>Camptostoma anomalum</i>	x	x	x	x	x	x	x	x	x	x	C
<i>Cyprinella galactura</i>	x	x		x		x	x	x		x	C
<i>Cyprinella monacha</i>								C			
<i>Cyprinella spiloptera</i>			x			x	x			x	C
<i>Cyprinus carpio</i>						x				x	
<i>Erimystax dissimilis</i>						x	x			x	C
<i>Hybopsis amblops</i>	x	x	x				x		x	x	C
<i>Luxilus chrysocephalus</i>	x	C	x	x		x		x		x	C
<i>Luxilus coccogenis</i>		C	x			x		x		x	C
<i>Nocomis micropogon</i>		x			x	x	x	x		x	
<i>Notemigonus crysoleucas</i>										x	
<i>Notropis leuciodus</i>		C				x		x		x	
<i>Notropis photogenis</i>		C								x	C
<i>Notropis rubellus</i>		C	x								
<i>Notropis rubricroceus</i>	C							x			
<i>Notropis spectrunculus</i>	C	C									

Table D2. (continued) ... Middle Fork Holston River in Washington County, Virginia.

Scientific Name	MCM 1885 (1)	DSJ 1888 (1)	LPS 1937 (1)	REJ 1967 (1)	REW 1969 (2)	NMB 1972 (2)	TVA 1973 (1)	WHH 1984 (3)	REJ 1986 (2)	TVA 1980s (4)	MHH 1993 (1)
<i>Notropis cf. spectrunculus</i>		C	C								
<i>Notropis telescopus</i>	C	C	C				x			x	C
<i>Notropis volucellus</i>			C								
<i>Phenacobius uranops</i>		C					x		x	x	C
<i>Pimephales notatus</i>			x			x	x			x	C
<i>Pimephales promelas</i>										x	
<i>Rhinichthys atratulus</i>	x					x	x			x	
<i>Semotilus atromaculatus</i>							x			x	
<i>Carpionodes cyprinus</i>										x	
<i>Catostomus commersoni</i>	x	x								x	C
<i>Hypentelium nigricans</i>	C	x	x	x	x	x	x	x	x	x	x
<i>Moxostoma carinatum</i>					x					x	
<i>Moxostoma duquesnei</i>		x			x					x	
<i>Moxostoma erythrum</i>		C	x							x	
<i>Moxostoma macrolepidotum</i>					x					x	
<i>Ameiurus natalis</i>							x			x	
<i>Ictalurus punctatus</i>										x	
<i>Pylodictus olivaris</i>					x		x				
<i>Esox lucius</i>										x	
<i>Cottus baileyi</i>		C									
<i>Cottus cf. bairdi</i>						x		x	x		

Table D2. (continued) ... Middle Fork Holston River in Washington County, Virginia.

Scientific Name	MCM 1885 (1)	DSJ 1888 (1)	LPS 1937 (1)	REJ 1967 (1)	REW 1969 (2)	NMB 1972 (2)	TVA 1973 (1)	WHH 1984 (3)	REJ 1986 (2)	TVA 1980s (4)	MHH 1993 (1)
<i>Cottus carolinae</i>		C	C			x	x		x	x	
<i>Ambloplites rupestris</i>	x	C	x		x	x	x			x	
<i>Lepomis auritus</i>						x	x	x		x	x
<i>Lepomis cyanellus</i>											x
<i>Lepomis gibbosus</i>					x					x	
<i>Lepomis macrochirus</i>		C	x	x	x	x	x			x	x
<i>Lepomis megalotis</i>				x	x		x	x			
<i>Micropterus dolomieu</i>		C	x		x		x			x	
<i>Micropterus salmoides</i>					x	x				x	
<i>Pomoxis nigromaculatus</i>					x	x				x	
<i>Etheostoma blennioides</i>		C	x	x		x	x	x	x	x	C
<i>Etheostoma flabellare</i>	x										
<i>Etheostoma rufilineatum</i>	x	C				x	x	x	x	x	C
<i>Etheostoma simoterum</i>	C	x	x				x			x	C
<i>Etheostoma vulneratum</i>							x			x	
<i>Etheostoma zonale</i>		x				x	x	x	x	x	C
<i>Percina caprodes</i>							x	x		x	
<i>Percina macrocephala</i>		C	x								

Table D3. Middle Fork Holston River in Smyth County, Virginia. Forty-five nominal fish species and two undescribed taxa from 40 samples. Number of samples (#) per column are listed. Collections summarized were taken by D.S. Jordan in 1888 (DSJ 1888); E.A. Lachner in 1940 (EAL 1940); R.H. Gibbs in 1952 (RHG 1952); R.D. Ross in 1954, 1956, 1957, and 1958 (RDR 1950's); W.S. Woolcott in 1958 and 1963 (WSW 1958, 1963); W.J. Richards in 1961 and 1962 (WJR 1960's); J.D. Williams in 1970 (JDW 1970); J.R. Reed in 1973 (JRR 1973); the Tennessee Valley Authority in 1973 and 1986 (TVA 1973, 1986); T.M. Cavender in 1976 (TMC 1976); R.E. Jenkins in 1976 (REJ 1976); N.M. Burkhead in 1983, 1984, and 1985 (NMB 1980's); W.H. Haxo in 1984 (WHH 1984); and M.H. Hughes in 1993 (MHH 1993).
C= catalogued specimens; x= species reported.

Scientific Name	DSJ 1888 (1)	EAL 1940 (1)	RHG 1952 (3)	RDR 1950's (7)	WSW 1958 (1)	WJR 1960's (3)	WSW 1963 (1)	JDW 1970 (1)	JRR 1973 (1)	TVA 1973 (2)	TMC 1976 (1)	REJ 1976 (1)	WRW 1979 (1)	NMB 1980's (9)	WHH 1984 (2)	TVA 1986 (1)	MHH 1993 (4)
<i>Ichthyomyzon greeleyi</i>												x		x			
<i>Camptostoma anomalum</i>	x	C	C	x	x	C	x	C	x	x		x	x	x	x	x	C
<i>Cyprinella galactura</i>	x	C	C	x	x	C						x		x		x	x
<i>Cyprinella spiloptera</i>			C														
<i>Cyprinus carpio</i>												x				x	
<i>Erimystax dissimilis</i>				x		C				x							
<i>Hybopsis amblops</i>	x	C	C	x	x	C	x			x		x	x	x		x	
<i>Luxilus chrysocephalus</i>			C	x		C		C		x		x		x	x	x	C
<i>Luxilus coccogenis</i>	x		C	x		C				x		x		x	x	x	C
<i>Nocomis micropogon</i>	x			x		C	x			x		x			x		C
<i>Notemigonus crysoleucas</i>																	C
<i>Notropis leuciodus</i>	x			x		C				x					x		C
<i>Notropis photogenis</i>				x		C						x				x	
<i>Notropis rubellus</i>						C						x		x			
<i>Notropis rubricroceus</i>	x	C	C	x		C	x		x	x		x	x	x	x		C
<i>Notropis spectrunculus</i>	x		C	x	x	C	x			x		x		x			
<i>Notropis cf spectrunculus</i>		C															
<i>Notropis stramineus</i>				x													
<i>Notropis telescopus</i>	x	C	C		x	C		C	x	x		x	x	x	x	C	x
<i>Phenacobius uranops</i>				x													
<i>Pimephales notatus</i>				x					x				x				

Table D3. (continued) ... Middle Fork Holston River in Smyth County, Virginia

Scientific Name	DSJ 1888 (1)	EAL 1940 (1)	RHG 1952 (3)	RDR 1950s (7)	WSW 1958 (1)	WJR 1960s (3)	WSW 1963 (1)	JDW 1970 (1)	JRR 1973 (1)	TVA 1973 (2)	TMC 1976 (1)	REJ 1976 (1)	WRW 1979 (1)	NMB 1980s (9)	WHH 1984 (2)	TVA 1986 (1)	MHH 1993 (4)
<i>Rhinichthys atratulus</i>	x	C	C	x	x				x	x	C	x	x	x			C
<i>Semotilus atromaculatus</i>						C				x		x		x			
<i>Catostomus commersoni</i>	x	C	C	x	x		x			x			x	x		x	C
<i>Hypentelium nigricans</i>	x	C	C	x	x		x	C	x	x		x		x	x	x	x
<i>Moxostoma duquesnei</i>				C												x	
<i>Moxostoma erythrurum</i>	x			C												x	
<i>Ameiurus natalis</i>																	C
<i>Oncorhynchus mykiss</i>														x	x	x	
<i>Salmo trutta</i>														x			x
<i>Cottus baileyi</i>		C	C		x	C			x		C	x		x			
<i>Cottus cf. bairdi</i>		C		C	x		x		x	x		x		x	x		
<i>Cottus carolinæ</i>		C	C	C	x	C	x	C	x	x		x		x	x	x	
<i>Ambloplites rupestris</i>	x		C	C	x	C	x	C		x				x	x	x	C
<i>Lepomis auritus</i>			C														
<i>Lepomis cyanellus</i>										x							
<i>Lepomis gibbosus</i>														x		x	
<i>Lepomis macrochirus</i>				x		C				x						x	
<i>Lepomis megalotis</i>				x													x
<i>Micropterus dolomieu</i>				x						x					x	x	
<i>Pomoxis nigromaculatus</i>																x	
<i>Etheostoma blennioides</i>				C													C
<i>Etheostoma flabellare</i>	x	C			x	C		C	x	x				x			C
<i>Etheostoma rufilineatum</i>	x	C		x	x	C	x	C				x	x	x	x		C
<i>Etheostoma simoterum</i>	x	C	C	x	x	C		C	x	x		x	x	x		x	C
<i>Etheostoma swainsona</i>	x	C		C	x	C	x	C	x			x					
<i>Etheostoma zonale</i>				C													

APPENDIX E

Table E1. Collection summary from the Watauga River. Fifty-eight nominal species from 33 collections. Number of samples (#) per column listed. Collections summarized from Tennessee (TN) and North Carolina (NC) by counties.
C= catalogued specimens; x= species reported.

Scientific Name	TN Carter County (15)	TN Johnson County (4)	NC Watauga County (14)
<i>Ichthyomyzon bdellium</i>	C		
<i>Lampetra appendix</i>	C		
<i>Lepisosteus osseus</i>	x		
<i>Dorosoma cepedianum</i>	x		
<i>Dorosoma petenense</i>	C		
<i>Camptostoma anomalum</i>	C	C	C
<i>Clinostomus funduloides</i>			C
<i>Cyprinella galactura</i>	C	C	C
<i>Cyprinella spiloptera</i>	x	x	
<i>Cyprinus carpio</i>	x		x
<i>Erimystax dissimilis</i>	C		
<i>Hybopsis amblops</i>	C	C	
<i>Luxilus chrysocephalus</i>	C		
<i>Luxilus coccogenis</i>	C	C	C
<i>Nocomis micropogon</i>	C	C	C
<i>Notropis ariommus</i>	C		
<i>Notropis leuciodus</i>	C	C	C
<i>Notropis photogenis</i>	C	x	
<i>Notropis rubellus</i>	C		
<i>Notropis spectrunculus</i>	C	C	
<i>Notropis telescopus</i>	C	C	
<i>Notropis volucellus</i>	C	C	
<i>Phenacobius crassilabrum</i>	C		
<i>Phenacobius uranops</i>	C		

Scientific Name	TN Carter County (15)	TN Johnson County (4)	NC Watauga County (14)
<i>Pimephales notatus</i>	C	x	
<i>Rhinichthys atratulus</i>	C		C
<i>Rhinichthys cataractae</i>	C		C
<i>Catostomus commersoni</i>	C	x	
<i>Hypentelium nigricans</i>	C	C	C
<i>Moxostoma duquesnei</i>	C	C	x
<i>Moxostoma erythrurum</i>	C	x	
<i>Moxostoma macrolepidotum</i>	x		
<i>Ameiurus natalis</i>		x	
<i>Ictalurus furcatus</i>		x	
<i>Ictalurus punctatus</i>	x	x	
<i>Noturus insignis</i>		x	C
<i>Pylodictus olivaris</i>	x		
<i>Oncorhynchus mykiss</i>	x	x	
<i>Salmo trutta</i>	x		
<i>Cottus baileyi</i>		x	
<i>Cottus bairdi</i>	x		
<i>Cottus carolinae</i>	C	C	
<i>Ambloplites rupestris</i>	C	x	C
<i>Lepomis auritus</i>		x	C
<i>Lepomis cyanellus</i>	x	x	
<i>Lepomis macrochirus</i>	x	x	
<i>Micropterus dolomieu</i>	C	C	C
<i>Micropterus salmoides</i>	x	x	

Scientific Name	TN Carter County (15)	TN Johnson County (4)	NC Watauga County (14)
<i>Pomoxis nigromaculatus</i>	x		
<i>Etheostoma blennioides</i>	C	x	
<i>Etheostoma chlorobranchium</i>		x	C
<i>Etheostoma flabellare</i>		x	
<i>Etheostoma rufilineatum</i>	C	C	
<i>Etheostoma simoterum</i>	C		
<i>Etheostoma zonale</i>	C	x	C
<i>Percina aurantiaca</i>		x	C
<i>Percina caprodes</i>		x	
<i>Percina macrocephala</i>	C		
<i>Percina squamata</i>	C	x	

Table E2. Watauga River in Carter County, Tennessee. Forty-nine nominal species from 14 collections. Number of samples (#) per column are listed. Collections summarized were taken by D.S. Jordan in 1888 (DSJ 1888); A.R. Cahn in 1937 (ARC 1937); RMB in 1947 (RMB 1947); the Tennessee Game and Fish Commission in 1953 (TGFC 1953); D.A. Etnier in 1973 (DAE 1973); N.M. Burkhead in 1978 (NMB 1978), the Tennessee Valley Authority in 1988 (TVA 1988); the Tennessee Wildlife Resources Agency in 1988 (TWRA 1988); and M.H. Hughes in 1991 (MHH 1991). C= catalogued specimens; x= species reported.

Scientific Name	DSJ 1888 (1)	ARC 1937 (1)	RMB 1947 (1)	TGFC 1953 (1)	DAE 1973 (1)	NMB 1978 (2)	TVA 1988 (1)	TWRA 1988 (5)	MHH 1991 (1)
<i>Ichthyomyzon bdellium</i>							C		
<i>Lampetra appendix</i>						C	C		
<i>Lepisosteus osseus</i>							x		
<i>Dorosoma cepedianum</i>							x		
<i>Dorosoma petenense</i>							C		
<i>Camptostoma anomalum</i>	x	C	C	x		x		x	C
<i>Cyprinella galactura</i>	x	C	C						
<i>Cyprinella spiloptera</i>						x			
<i>Cyprinus carpio</i>							x		
<i>Erimystax dissimilis</i>	C	C							
<i>Hybopsis amblops</i>	x	C	C						
<i>Luxilus chrysocephalus</i>	x	C							
<i>Luxilus coccogenis</i>	x		C						
<i>Nocomis micropogon</i>	x	C	C	x					
<i>Notropis ariommus</i>	C								
<i>Notropis leucious</i>		C	C						
<i>Notropis photogenis</i>	C						C		
<i>Notropis rubellus</i>			C						
<i>Notropis spectrunculus</i>			C						
<i>Notropis telescopus</i>	C	C	C			x			
<i>Notropis volucellus</i>		C	C						
<i>Phenacobius crassilabrum</i>			C					C	
<i>Phenacobius uranops</i>	C								
<i>Pimephales notatus</i>							C		
<i>Rhinichthys atratulus</i>									C

Scientific Name	DSJ 1888 (1)	ARC 1937 (1)	RMB 1947 (1)	TGFC 1953 (1)	DAE 1973 (1)	NMB 1978 (2)	TVA 1988 (1)	TWRA 1988 (5)	MHH 1991 (1)
<i>Rhinichthys cataractae</i>							C		
<i>Catostomus commersoni</i>	x						C	x	
<i>Hypentelium nigricans</i>	x	C	C				C	x	
<i>Moxostoma duquesnei</i>	C	C	C				C		
<i>Moxostoma erythrurum</i>			C						
<i>Moxostoma macrolepidotum</i>							x		
<i>Ictalurus punctatus</i>							x		
<i>Pylodictus olivaris</i>	x								
<i>Oncorhynchus mykiss</i>				x			x	x	x
<i>Salmo trutta</i>							x	x	x
<i>Cottus bairdi</i>						x	x	x	
<i>Cottus carolinae</i>			C		x	x	x	x	
<i>Ambloplites rupestris</i>	x		C		x		x		
<i>Lepomis cyanellus</i>							x		
<i>Lepomis macrochirus</i>							x	x	
<i>Micropterus dolomieu</i>			C					x	
<i>Micropterus salmoides</i>							x		
<i>Pomoxis nigromaculatus</i>							x		
<i>Etheostoma blennioides</i>		C	C					x	
<i>Etheostoma rufilineatum</i>			C						
<i>Etheostoma simoterum</i>							x		C
<i>Etheostoma zonale</i>			C						
<i>Percina macrocephala</i>			C						
<i>Percina squamata</i>	C								

Table E3. Watauga River in Johnson County, Tennessee. Thirty-seven nominal species from 4 collections. Number of samples per column are listed. Collections summarized per column were taken by R.M. Bailey in 1947 (RMB 1947); D.A. Etnier in 1973 (DAE 1973); and N.M. Burkhead in 1978 (NMB 1978).
C= catalogued specimens; x= species reported.

Scientific Name	RMB 1947 (1)	DAE 1973 (1)	NMB 1978 (2)
<i>Camptostoma anomalum</i>	C	x	x
<i>Cyprinella galactura</i>	C	x	x
<i>Cyprinella spiloptera</i>		x	x
<i>Hybopsis amblops</i>	C	x	
<i>Luxilus coccogenis</i>	C	x	x
<i>Nocomis micropogon</i>	C	x	x
<i>Notropis leuciodus</i>	C	x	x
<i>Notropis photogenis</i>		x	x
<i>Notropis spectrunculus</i>	C		
<i>Notropis telescopus</i>	C		x
<i>Notropis volucellus</i>	C		
<i>Pimephales notatus</i>		x	x
<i>Catostomus commersoni</i>			x
<i>Hypentelium nigricans</i>	C	x	x
<i>Moxostoma duquesnei</i>	C	x	x
<i>Moxostoma erythrum</i>		x	x
<i>Ameiurus natalis</i>			x
<i>Ictalurus furcatus</i>		x	
<i>Ictalurus punctatus</i>		x	
<i>Noturus insignis</i>		x	x

Scientific Name	RMB 1947 (1)	DAE 1973 (1)	NMB 1978 (2)
<i>Oncorhynchus mykiss</i>			x
<i>Cottus baileyi</i>			x
<i>Cottus carolinae</i>	C		
<i>Ambloplites rupestris</i>		x	
<i>Lepomis auritus</i>		x	x
<i>Lepomis cyanellus</i>			x
<i>Lepomis macrochirus</i>		x	x
<i>Micropterus dolomieu</i>	C	x	x
<i>Micropterus salmoides</i>			x
<i>Etheostoma blennioides</i>		x	x
<i>Etheostoma chlorobranchium</i>		x	x
<i>Etheostoma flabellare</i>		x	x
<i>Etheostoma rufilineatum</i>	C	x	x
<i>Etheostoma zonale</i>		x	x
<i>Percina aurantiaca</i>			x
<i>Percina caprodes</i>		x	x
<i>Percina squamata</i>		x	x

Table E4. Watauga River in Watauga County, North Carolina. Seventeen nominal species from 14 collections. Number of samples (#) per column are listed. Collections summarized per column were taken by J.R. Bailey in 1941 (JRB 1941); C.C. Swift in 1964 (CCS 1964); L.R. Goodman in 1972 (LRG 1972); E.F. Menhinick in 1976, 1977 (EFM 1970s) and 1985 (EFM 1977 and 1985); the Tennessee Valley Authority in 1988 (TVA 1988); and M.H. Hughes in 1991 (MHH 1991). C= catalogued specimens; x= species reported.

Scientific Name	JRB 1941 (2)	CCS 1964 (4)	LRG 1972 (2)	EFM 1970s (2)	EFM 1985 (1)	TVA 1988 (1)	MHH 1991 (2)
<i>Campostoma anomalum</i>	x	C	x	x	x	x	C
<i>Clinostomus funduloides</i>		C					
<i>Cyprinella galactura</i>	x	C	x	x	x	x	C
<i>Cyprinus carpio</i>						x	
<i>Luxilus coccogenis</i>	x	C		x		x	C
<i>Nocomis micropogon</i>	x	C	x	x	x	x	C
<i>Notropis leuciodus</i>	x	C	x	x	x	x	C
<i>Rhinichthys atratulus</i>		C					
<i>Rhinichthys cataractae</i>		C					
<i>Hypentelium nigricans</i>	x	C		x		x	x
<i>Moxostoma duquesnei</i>						x	
<i>Noturus insignis</i>		C	C	x	C	x	C
<i>Ambloplites rupestris</i>		C		x	C	x	x
<i>Lepomis auritus</i>				x		x	C
<i>Micropterus dolomieu</i>	x	C		x	C	x	x
<i>Etheostoma chlorobranchium</i>	x	C	C	x	C	x	C
<i>Percina aurantiaca</i>	x	C		x		x	C

APPENDIX F

Table F1. Boone Lake cove rotenone collections, 1953 to 1983 by the Tennessee Valley Authority. Occurrence of 39 fish species recovered in 31 samples. The years collected head the columns followed by the number of samples in parenthesis (#).
x=species reported; ?=questionable record without voucher specimen.

Scientific Name	1953 (3)	1955 (2)	1956 (2)	1959 (2)	1961 (2)	1962 (16)	1982 (2)	1983 (2)
<i>Lepisosteus osseus</i>					x		x	x
<i>Alosa pseudoharengus</i>								x
<i>Dorosoma cepedianum</i>	x	x	x	x	x	x	x	x
<i>Dorosoma petenense</i>						x		
<i>Carassius auratus</i>			x	x	x	x		
<i>Cyprinella galactura</i>							x	x
<i>Cyprinella spiloptera</i>					x			
<i>Cyprinus carpio</i>	x	x	x	x	x	x	x	x
<i>Notemigonus crysoleucas</i>							x	x
<i>Notropis atherinoides</i>							?	?
<i>Pimephales notatus</i>					x		x	x
<i>Pimephales vigilax</i>					x			
<i>Carpiodes carpio</i>					x		x	x
<i>Carpiodes cyprinus</i>					x	x		
<i>Catostomus commersoni</i>	x	x				x	x	
<i>Hypentelium nigricans</i>						x		
<i>Moxostoma carinatum</i>							x	
<i>Moxostoma duquesnei</i>		x			x			
<i>Moxostoma erythrum</i>				x		x		x
<i>Moxostoma macrolepidotum</i>				x				
<i>Ameiurus melas</i>							x	x

Scientific Name	1953 (3)	1955 (2)	1956 (2)	1959 (2)	1961 (2)	1962 (16)	1982 (2)	1983 (2)
<i>Ameiurus natalis</i>				x		x	x	x
<i>Ictalurus furcatus</i>								x
<i>Ictalurus punctatus</i>			x	x		x	x	x
<i>Pylodictis olivaris</i>						x	x	x
<i>Morone chrysops</i>						x	x	x
<i>Morone saxatilis</i>						x	x	
<i>Ambloplites rupestris</i>	x		x			x		
<i>Lepomis auritus</i>				x				
<i>Lepomis cyanellus</i>					x	x	x	x
<i>Lepomis gulosus</i>	x	x	x	x	x	x	x	x
<i>Lepomis macrochirus</i>	x	x	x	x	x	x	x	x
<i>Lepomis megalotis</i>			x		x	x	x	x
<i>Lepomis microlophus</i>					x	x		
<i>Micropterus dolomieu</i>	x			x	x	x	x	
<i>Micropterus salmoides</i>	x	x		x	x	x	x	x
<i>Pomoxis annularis</i>				x	x	x	x	x
<i>Pomoxis nigromaculatus</i>	x	x	x	x	x	x	x	x
<i>Percina caprodes</i>					x		x	x

Table F2. Cherokee Lake cove rotenone collections, 1949 to 1991 by the Tennessee Valley Authority. Occurrence of 61 fish species identified from six decades in 110 samples. The column headings combine collections. The years collected head the column followed in parenthesis by the number of samples taken during that time period, for example 1949 (1) — means that 1 collection was made in 1949. A detailed breakdown of the column headings is given here. The column headings 1949 (1) and 1991 (4) are self explanatory. The heading 1950-1959 (9) consists of the following segments 1950 (1), 1951 (1), 1953 (1), 1955 (1), 1956 (1), 1957 (1), 1958 (1), 1959 (1). The column heading 1960, 1963 (15) equals 1960 (3) and 1963 (12). The column heading 1972-1979 was segmented as follows 1972 (3), 1973 (4), 1974 (3), 1975 (7), 1976 (7), 1977 (7), 1978 (4), 1979 (4). The column heading 1980-1989 was divided into collections from 1980 (6), 1981 (2), 1982 (6), 1983 (4), 1984 (4), 1985 (4), 1986 (4), 1987 (4), 1988 (4), and 1989 (4).

C= catalogued specimens; x= species reported; ?= questionable record without voucher specimens.

Scientific Name	1949 (1)	1950-1959 (9)	1960, 1963 (15)	1972-1979 (39)	1980-1989 (42)	1991 (4)
<i>Lepisosteus osseus</i>			x	x	x	x
<i>Alosa pseudoharengus</i>					x	x
<i>Dorosoma cepedianum</i>	x	x	x	x	x	x
<i>Dorosoma petenense</i>		x	x	x	x	x
<i>Hiodon tergisus</i>			x			
<i>Camptostoma anomalum</i>	C	x		x	x	x
<i>Carassius auratus</i>			x	x	x	x
<i>Cyprinella galactura</i>			x	x	x	
<i>Cyprinella spiloptera</i>	x	x	x	x	x	x
<i>Cyprinus carpio</i>		x	x	x	x	x
<i>Luxilus chrysocephalus</i>				x	x	
<i>Nocomis micropogon</i>	x				x	
<i>Notemigonus crysoleucas</i>			x	x		
<i>Notropis atherinoides</i>				?		
<i>Notropis leuciodus</i>				x		
<i>Notropis photogenis</i>					x	
<i>Notropis rubellus</i>				x		
<i>Notropis stramineus</i>					x	
<i>Pimephales notatus</i>				x	x	x
<i>Pimephales promelas</i>					x	
<i>Pimephales vigilax</i>		x	x	x	x	x
<i>Semotilus atromaculatus</i>					x	
<i>Carpionotus carpio</i>				x	x	x

Scientific Name	1949 (1)	1950-1959 (9)	1960, 1963 (15)	1972-1979 (39)	1980-1989 (42)	1991 (4)
<i>Carpionotus cyprinus</i>			x	x	x	x
<i>Carpionotus velifer</i>				?		
<i>Catostomus commersoni</i>					x	
<i>Hyphessobrycon nigricans</i>	x	x	x	x	x	x
<i>Ictalurus bubalus</i>				x	x	x
<i>Moxostoma carinatum</i>			x	x	x	
<i>Moxostoma duquesnei</i>		x		x	x	x
<i>Moxostoma erythrurum</i>		x	x	x	x	x
<i>Moxostoma macrolepidotum</i>	C	x	x	x	x	
<i>Ameiurus melas</i>				x		
<i>Ameiurus natalis</i>		x	x	x	x	x
<i>Ictalurus furcatus</i>				x	x	
<i>Ictalurus punctatus</i>	C	x	x	x	x	x
<i>Pylodictis olivaris</i>	x	x	x	x	x	x
<i>Gambusia affinis</i>			x	x	x	x
<i>Labidesthes sicculus</i>	x	x	x	x	x	x
<i>Cottus caroliniae</i>				x	x	x
<i>Morone chrysops</i>		x	x	x	x	x
<i>Morone saxatilis</i>				x	x	x
<i>Ambloplites rupestris</i>		x	x	x	x	
<i>Lepomis auritus</i>		x	x	x	x	x
<i>Lepomis cyanellus</i>					x	x
<i>Lepomis gulosus</i>	x	x	x	x	x	x

Table F2. (continued) ... Cherokee Lake cove rotenone collections, 1949 to 1991 by the Tennessee Valley Authority.

Scientific Name	1949 (1)	1950-1959 (9)	1960, 1963 (15)	1972-1979 (39)	1980-1989 (42)	1991 (4)
<i>Lepomis macrochirus</i>	X	X	X	X	X	X
<i>Lepomis megalotis</i>			X	X	X	X
<i>Lepomis microlophus</i>				X	X	X
<i>Micropterus dolomieu</i>	X	X	X	X	X	X
<i>Micropterus punctulatus</i>		X	X	X	X	X
<i>Micropterus salmoides</i>	X	X	X	X	X	X
<i>Pomoxis annularis</i>		X	X	X	X	X
<i>Pomoxis nigromaculatus</i>		X	X	X	X	X
<i>Etheostoma blennioides</i>				X	X	
<i>Etheostoma rufilineatum</i>					X	
<i>Etheostoma simoterum</i>					X	
<i>Percina caprodes</i>	C	X	X	X	X	X
<i>Stizostedion canadense</i>		X	X	X		
<i>Stizostedion vitreum</i>	X	X	X		X	X
<i>Aplodinotus grunniens</i>			X	X	X	X

Table F3. Fort Patrick Henry Lake cove rotenone collections, 1954-1985 by the Tennessee Valley Authority. Occurrence of 24 fish species identified from 8 samples. Years collected head the columns followed by the number of samples in parenthesis (#).
x= species present.

Scientific Name	1954 (2)	1955 (3)	1956 (1)	1960 (1)	1985 (1)
<i>Alosa pseudoharengus</i>					x
<i>Dorosoma cepedianum</i>	x	x		x	x
<i>Camptostoma anomalum</i>					x
<i>Cyprinus carpio</i>	x	x	x	x	x
<i>Catostomus commersoni</i>	x				x
<i>Hypentelium nigricans</i>					x
<i>Moxostoma carinatum</i>		x			
<i>Moxostoma duquesnei</i>		x			
<i>Moxostoma erythrurum</i>		x		x	
<i>Ameiurus natalis</i>		x	x		
<i>Ictalurus punctatus</i>	x	x	x	x	x
<i>Pylodictis olivaris</i>			x		
<i>Cottus carolinae</i>					x
<i>Morone chrysops</i>					x
<i>Ambloplites rupestris</i>	x	x	x	x	
<i>Lepomis auritus</i>			x	x	
<i>Lepomis gulosus</i>	x	x	x	x	x
<i>Lepomis macrochirus</i>		x	x	x	x
<i>Lepomis megalotis</i>	x			x	x
<i>Micropterus dolomieu</i>	x	x	x	x	
<i>Micropterus salmoides</i>	x	x	x	x	x
<i>Pomoxis annularis</i>			x	x	
<i>Pomoxis nigromaculatus</i>	x	x	x	x	x
<i>Percina caprodes</i>	x		x		x

Table F4. South Holston Lake cove rotenone collections, 1951-1985 by the Tennessee Valley Authority. Occurrence of 46 fish species identified from 45 samples. The years collected head the column followed by the number of samples in parenthesis (#). The time period collected heads the column. For example 1985 (2) means—2 collections were made in 1985. A detailed breakdown of the first three column headings is given here. The heading 1950s (7) consists of the following samples per year 1951 (1), 1953 (1), 1955 (1), 1956 (1), 1957 (1), 1958 (1), 1959 (1). The column heading 1960s equals 1960 (3) and 1962 (15). The column heading 1970s equals 1972 (8), 1977 (4), 1978 (4), 1979 (2). x= species reported; ?=questionable record without voucher specimens.

Scientific Name	1950 (7)	1960s (18)	1970s (18)	1985 (2)
<i>Dorosoma cepedianum</i>	x	x	x	x
<i>Dorosoma petenense</i>	x	x	x	x
<i>Camptostoma anomalum</i>	x		x	x
<i>Carassius auratus</i>		x		
<i>Cyprinella galactura</i>	x	x	x	
<i>Cyprinella monacha</i>	x			
<i>Cyprinella spiloptera</i>		c	x	x
<i>Cyprinus carpio</i>	x	x	x	x
<i>Luxilus chrysocephalus</i>			x	
<i>Luxilus coccogenis</i>	x		x	
<i>Notemigonus crysoleucas</i>			x	
<i>Notropis ariommus</i>	?			
<i>Notropis atherinoides</i>			?	
<i>Pimephales notatus</i>	x	x	x	x
<i>Pimephales promelas</i>		x		
<i>Pimephales vigilax</i>		x		
<i>Rhinichthys atratulus</i>		x	x	x
<i>Semotilus atromaculatus</i>			x	
<i>Carpiodes cyprinus</i>		x	x	x
<i>Catostomus commersoni</i>	x			
<i>Hypentelium nigricans</i>	x	x	x	x
<i>Moxostoma anisurum</i>			x	
<i>Moxostoma carinatum</i>	x	x	x	

Scientific Name	1950 (7)	1960s (18)	1970s (18)	1985 (2)
<i>Moxostoma duquesnei</i>	x	x	x	
<i>Moxostoma erythrurum</i>	x	x	x	
<i>Moxostoma macrolepidotum</i>	x	x	x	
<i>Ameiurus natalis</i>		x	x	x
<i>Ictalurus punctatus</i>	x	x	x	x
<i>Pylodictis olivaris</i>	x	x	x	x
<i>Esox masquinongy</i>			x	
<i>Oncorhynchus mykiss</i>			x	
<i>Morone chrysops</i>	x	x	x	x
<i>Ambloplites rupestris</i>	x	x	x	x
<i>Lepomis auritus</i>		x		x
<i>Lepomis gibbosus</i>	x	x	x	x
<i>Lepomis gulosus</i>	x	x	x	x
<i>Lepomis macrochirus</i>	x	x	x	x
<i>Lepomis megalotis</i>	x			
<i>Lepomis microlophus</i>	x		x	
<i>Micropterus dolomieu</i>	x	x	x	x
<i>Micropterus punctulatus</i>			x	
<i>Micropterus salmoides</i>	x	x	x	x
<i>Pomoxis annularis</i>	x	x	x	x
<i>Pomoxis nigromaculatus</i>			x	x
<i>Percina caprodes</i>		x	x	x
<i>Stizostedion vitreum</i>			x	x

Table F5. Watauga Lake cove rotenone collections, 1949-1980 by the Tennessee Valley Authority. Occurrence of 46 fish species identified from 38 samples. Years collected head the column followed by the number of samples in parenthesis (#) taken during that time period, for example 1949 (1) means, one collection was made in 1949. The column headings 1949 (1), 1961 (3) are self explanatory. The heading 1950s (10) consists of 10 samples consisting of 1955 with 2 samples (2) and eight years with one sample (1) each 1950, 1951, 1952, 1954, 1956, 1957, 1958, 1959. The 1970s was collected as follows 1971 (6), 1972 (3), 1973 (3), 1979 (2). The 1980s was segmented as follows 1980 (2), 1981 (2), 1982 (2), 1983 (2), 1984 (2). x= species reported, ?= questionable report without voucher specimens.

Scientific Name	1949 (1)	1950s (10)	1961 (3)	1970s (14)	1980s (10)
<i>Alosa pseudoharengus</i>				x	C
<i>Dorosoma cepedianum</i>		x	x	x	x
<i>Dorosoma petenense</i>		x	x	x	x
<i>Camptostoma anomalum</i>	x			x	x
<i>Carassius auratus</i>				x	
<i>Cyprinella galactura</i>	x			x	x
<i>Cyprinella spiloptera</i>	x				
<i>Cyprinella whipplei</i>				?	?
<i>Cyprinus carpio</i>		x	x	x	x
<i>Hybopsis amblops</i>					x
<i>Luxilus chrysocephalus</i>				x	x
<i>Luxilus coccogenis</i>					x
<i>Nocomis micropogon</i>	x			x	
<i>Notemigonus crysoleucas</i>				x	x
<i>Notropis atherinoides</i>				?	
<i>Notropis telescopus</i>				x	x
<i>Pimephales notatus</i>			x	x	x
<i>Pimephales promelas</i>					x
<i>Pimephales vigilax</i>	x	x			x
<i>Rhinichthys atratulus</i>				x	x
<i>Semotilus atromaculatus</i>					x
<i>Catostomus commersoni</i>		x		x	x
<i>Hypentelium nigricans</i>	x	x	x	x	x

Scientific Name	1949 (1)	1950s (10)	1961 (3)	1970s (14)	1980s (10)
<i>Moxostoma carinatum</i>		x	x	x	x
<i>Moxostoma duquesnei</i>		x	x	x	x
<i>Moxostoma erythrurum</i>		x	x	x	x
<i>Moxostoma macrolepidotum</i>		x	x	x	x
<i>Ameiurus natalis</i>		x	x	x	x
<i>Ictalurus punctatus</i>			x	x	x
<i>Noturus flavus</i>					x
<i>Noturus insignis</i>					x
<i>Pylodictis olivaris</i>		x	x	x	x
<i>Oncorhynchus mykiss</i>			x		
<i>Labidesthes sicculus</i>				x	x
<i>Ambloplites rupestris</i>	x	x	x	x	x
<i>Lepomis auritus</i>					x
<i>Lepomis cyanellus</i>				x	x
<i>Lepomis macrochirus</i>	x	x	x	x	x
<i>Micropterus dolomieu</i>	x	x	x	x	x
<i>Micropterus salmoides</i>	x	x	x	x	x
<i>Pomoxis annularis</i>	x	x	x	x	x
<i>Pomoxis nigromaculatus</i>	x	x	x	x	x
<i>Etheostoma blennioides</i>				x	
<i>Percina caprodes</i>		x	x	x	x
<i>Stizostedion vitreum</i>		x	x	x	
<i>Aplodinotus grunniens</i>			x	x	x

APPENDIX G

Table G1. Boone Lake comparing 3 sampling methods. Occurrence of 39 fish species collected by the Tennessee Valley Authority, electrofishing and gill netting in 1991; and cove rotenone poisoning from 1953-1983. Collection units (#) per column are listed. x= species reported.

Scientific Name	electrofishing 1991 (300 minutes)	gill netting 1991 (30 net nights)	cove rotenone 1953-1983 (31 samples)
<i>Lepisosteus osseus</i>	x	x	x
<i>Alosa pseudoharengus</i>		x	x
<i>Dorosoma cepedianum</i>	x	x	x
<i>Dorosoma petenense</i>	x	x	x
<i>Carassius auratus</i>			x
<i>Cyprinella galactura</i>			x
<i>Cyprinella spiloptera</i>	x		x
<i>Cyprinus carpio</i>	x	x	x
<i>Notemigonus crysoleucas</i>			x
<i>Notropis atherinoides</i>			?
<i>Pimephales notatus</i>			x
<i>Pimephales vigilax</i>			x
<i>Carpionodes carpio</i>			x
<i>Carpionodes cyprinus</i>		x	x
<i>Catostomus commersoni</i>			x
<i>Hypentelium nigricans</i>	x		x
<i>Moxostoma carinatum</i>			x
<i>Moxostoma duquesnei</i>	x	x	x
<i>Moxostoma erythrurum</i>	x		x
<i>Moxostoma macrolepidotum</i>			x
<i>Ameiurus melas</i>			x
<i>Ameiurus natalis</i>			x

Scientific Name	electrofishing 1991 (300 minutes)	gill netting 1991 (30 net nights)	cove rotenone 1953-1983 (31 samples)
<i>Ictalurus furcatus</i>			x
<i>Ictalurus punctatus</i>	x	x	x
<i>Pylodictis olivaris</i>	x	x	x
<i>Morone chrysops</i>	x	x	x
<i>Morone saxatilis</i>		x	x
<i>Ambloplites rupestris</i>	x		x
<i>Lepomis auritus</i>	x		x
<i>Lepomis cyanellus</i>	x	x	x
<i>Lepomis gulosus</i>	x		x
<i>Lepomis macrochirus</i>	x	x	x
<i>Lepomis megalotis</i>	x		x
<i>Lepomis microlophus</i>			x
<i>Micropterus dolomieu</i>	x	x	x
<i>Micropterus salmoides</i>	x	x	x
<i>Pomoxis annularis</i>			x
<i>Pomoxis nigromaculatus</i>	x	x	x
<i>Percina caprodes</i>	x		x

Table G2. Cherokee Lake comparing 3 sampling methods. Occurrence of 42 fish species collected by the Tennessee Valley Authority, 1989-1991. Collection units (#) were minutes of electrofishing, gill nights of gill netting, and samples of cove rotenone poisoning.
x= species present.

Scientific Name	electrofishing			gill netting			cove rotenone	
	1989 (300)	1990 (300)	1991 (300)	1989 (30)	1990 (30)	1991 (29)	1989 (35)	1991 (37)
<i>Lepisosteus osseus</i>		X		X	X		X	X
<i>Alosa pseudoharengus</i>							X	X
<i>Dorosoma cepedianum</i>	X	X	X	X	X	X	X	X
<i>Dorosoma petenense</i>	X	X	X		X		X	X
<i>Camptostoma anomalum</i>			X				X	X
<i>Carassius auratus</i>				X			X	X
<i>Cyprinella spiloptera</i>	X	X	X				X	X
<i>Cyprinus carpio</i>	X	X	X	X	X	X	X	X
<i>Pimephales notatus</i>		X					X	X
<i>Pimephales vigilax</i>	X						X	X
<i>Carpiodes carpio</i>	X	X		X	X		X	X
<i>Carpiodes cyprinus</i>	X		X	X	X	X	X	X
<i>Hypentelium nigricans</i>				X				X
<i>Ictiobus bubalus</i>				X	X	X	X	X
<i>Moxostoma carinatum</i>				X				
<i>Moxostoma duquesnei</i>	X		X				X	X
<i>Moxostoma erythrurum</i>	X	X	X	X	X		X	X
<i>Moxostoma macrolepidotum</i>			X					
<i>Ameiurus natalis</i>							X	X
<i>Ictalurus furcatus</i>						X		
<i>Ictalurus punctatus</i>	X	X		X	X	X	X	X
<i>Pylodictis olivaris</i>	X	X	X	X	X	X	X	X

Scientific Name	electrofishing			gill netting			cove rotenone	
	1989 (300)	1990 (300)	1991 (300)	1989 (30)	1990 (30)	1991 (29)	1989 (35)	1991 (37)
<i>Gambusia affinis</i>							X	X
<i>Labidesthes sicculus</i>	X	X	X				X	X
<i>Cottus caroliniae</i>								X
<i>Morone chrysops</i>				X	X	X		X
<i>Morone saxatilis</i>				X	X	X	X	X
<i>Ambloplites rupestris</i>	X	X	X		X		X	
<i>Lepomis auritus</i>	X	X	X				X	X
<i>Lepomis cyanellus</i>	X	X	X				X	X
<i>Lepomis gulosus</i>	X	X	X				X	X
<i>Lepomis macrochirus</i>	X	X	X	X	X	X	X	X
<i>Lepomis megalotis</i>	X							
<i>Lepomis microlophus</i>	X	X	X				X	X
<i>Micropterus dolomieu</i>	X	X	X	X	X	X	X	X
<i>Micropterus punctulatus</i>	X	X	X		X	X	X	X
<i>Micropterus salmoides</i>	X	X	X	X	X	X	X	X
<i>Pomoxis annularis</i>		X	X	X	X	X	X	X
<i>Pomoxis nigromaculatus</i>	X	X	X	X	X	X	X	X
<i>Percina caprodes</i>		X	X				X	X
<i>Stizostedion vitreum</i>	X	X	X	X	X	X	X	X
<i>Aplodinotus grunniens</i>		X	X	X	X	X	X	X

Table G3. South Holston Lake comparing 3 sampling methods. Occurrence of 46 fish species reported by the Tennessee Valley Authority, electrofishing and gill netting in 1991; and cove rotenone poisoning from 1951-1985. Collection units (#) per column are listed. x= species reported; ?=questionable report without voucher specimens.

Scientific Name	electrofishing 1991 (200 minutes)	gill netting 1991 (20 net nights)	cove rotenone 1951-1985 (45 samples)
<i>Dorosoma cepedianum</i>	x	x	x
<i>Dorosoma petenense</i>			x
<i>Camptostoma anomalum</i>			x
<i>Carassius auratus</i>			x
<i>Cyprinella galactura</i>			x
<i>Cyprinella monacha</i>			x
<i>Cyprinella spiloptera</i>	x		x
<i>Cyprinus carpio</i>			x
<i>Luxilus chrysocephalus</i>			x
<i>Luxilus coccogenis</i>			x
<i>Notemigonus crysoleucas</i>			x
<i>Notropis ariommus</i>			x
<i>Notropis atherinoides</i>	?		?
<i>Pimephales notatus</i>	x		x
<i>Pimephales promelas</i>			x
<i>Pimephales vigilax</i>			x
<i>Rhinichthys atratulus</i>			x
<i>Semotilus atromaculatus</i>			x
<i>Carpiodes cyprinus</i>		x	x
<i>Catostomus commersoni</i>		x	x
<i>Hypentelium nigricans</i>			x
<i>Moxostoma anisurum</i>		x	x
<i>Moxostoma carinatum</i>	x		x
<i>Moxostoma duquesnei</i>	x	x	x
<i>Moxostoma erythrurum</i>	x	x	x

Scientific Name	electrofishing 1991 (200 minutes)	gill netting 1991 (20 net nights)	cove rotenone 1951-1985 (45 samples)
<i>Moxostoma macrolepidotum</i>	x		x
<i>Ameiurus natalis</i>			x
<i>Ictalurus punctatus</i>	x	x	x
<i>Pylodictis olivaris</i>		x	x
<i>Esox masquinongy</i>			x
<i>Oncorhynchus mykiss</i>		x	x
<i>Morone chrysops</i>		x	x
<i>Ambloplites rupestris</i>	x		x
<i>Lepomis auritus</i>			x
<i>Lepomis gibbosus</i>	x		x
<i>Lepomis gulosus</i>	x		x
<i>Lepomis macrochirus</i>	x	x	x
<i>Lepomis megalotis</i>	x		x
<i>Lepomis microlophus</i>			x
<i>Micropterus dolomieu</i>	x	x	x
<i>Micropterus punctulatus</i>			x
<i>Micropterus salmoides</i>	x	x	x
<i>Pomoxis annularis</i>			x
<i>Pomoxis nigromaculatus</i>	x	x	x
<i>Percina caprodes</i>	x		x
<i>Stizostedion vitreum</i>	x	x	x

Table G4. Watauga Lake comparing 3 sampling methods. Occurrence of 49 fish species reported by the Tennessee Valley Authority, electrofishing and gill netting in 1991; and cove rotenone poisoning from 1949-1984. Collection units (#) per column are listed.
x= species reported; ?=questionable report without voucher specimens.

Scientific Name	electrofishing 1991 (200 minutes)	gill netting 1991 (20 net nights)	cove rotenone 1949-1984 (45 samples)
<i>Alsoa pseudoharengus</i>			x
<i>Dorosoma cepedianum</i>	x	x	x
<i>Dorosoma petenense</i>			x
<i>Campostoma anomalum</i>			x
<i>Carassius auratus</i>			x
<i>Cyprinella galactura</i>			x
<i>Cyprinella spiloptera</i>	x		x
<i>Cyprinella whipplei</i>			?
<i>Cyprinus carpio</i>	x	x	x
<i>Hybopsis amblops</i>			x
<i>Luxilus chrysocephalus</i>			x
<i>Luxilus coccogenis</i>			x
<i>Nocomis micropogon</i>			x
<i>Notemigonus crysoleucas</i>			x
<i>Notropis atherinoides</i>			?
<i>Notropis telescopus</i>			x
<i>Pimephales notatus</i>			x
<i>Pimephales promelas</i>			x
<i>Pimephales vigilax</i>			x
<i>Rhinichthys atratulus</i>			x
<i>Semotilus atromaculatus</i>			x
<i>Catostomus commersoni</i>			x
<i>Hypentelium nigricans</i>			x
<i>Moxostoma anisurum</i>		x	

Scientific Name	electrofishing 1991 (200 minutes)	gill netting 1991 (20 net nights)	cove rotenone 1949-1984 (45 samples)
<i>Moxostoma carinatum</i>		x	x
<i>Moxostoma duquesnei</i>			x
<i>Moxostoma erythrurum</i>	x		x
<i>Moxostoma macrolepidotum</i>			x
<i>Ameiurus natalis</i>			x
<i>Ictalurus punctatus</i>	x	x	x
<i>Noturus flavus</i>			x
<i>Noturus insignis</i>			x
<i>Pylodictis olivaris</i>	x	x	x
<i>Oncorhynchus mykiss</i>			x
<i>Labidesthes sicculus</i>			x
<i>Morone chrysops</i>			
<i>Ambloplites rupestris</i>	x	x	x
<i>Lepomis auritus</i>			x
<i>Lepomis cyanellus</i>			x
<i>Lepomis macrochirus</i>	x	x	x
<i>Micropterus dolomieu</i>	x	x	x
<i>Micropterus punctulatus</i>	x	x	
<i>Micropterus salmoides</i>	x		x
<i>Pomoxis annularis</i>			x
<i>Pomoxis nigromaculatus</i>			x
<i>Etheostoma blennioides</i>			x
<i>Percina caprodes</i>			x
<i>Stizostedion vitreum</i>	x	x	x
<i>Aplodinotus grunniens</i>		x	x

APPENDIX H

H1. *Ichthyomyzon bdellium* (Jordan, 1885)
Ohio lamprey

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096901;
Laurel Creek	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
Laurel Creek	
Beaverdam Creek	
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	1973, UT 2.24;
Watauga (Carter Co., TN)	1988, UT 2.171
Doe River	1988, UT 2.174;
Watauga (Sullivan Co., TN)	

H2. *Ichthyomyzon castaneus* Girard, 1858
chestnut lamprey

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	1993, UT 2.222;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
Laurel Creek	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
Laurel Creek	
Beaverdam Creek	
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	
Watauga (Carter Co., TN)	
Beaver Creek	
Doe River	
Elk River	
Stony Creek	
Watauga (Sullivan Co., TN)	

H3. *Ichthyomyzon greeleyi* Hubbs and Trautman, 1937
mountain brook lamprey

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1958, CU 43614;
Laurel Creek	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
Laurel Creek	
Beaverdam Creek	
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	1977, UT 2.78, 2.80;
Watauga (Carter Co., TN)	1978, UT 2.77;
Doe River	1988, UT 2.175;
Elk River	1977, UT 2.65; 1978, UT 2.76;
Stony Creek	
Watauga (Sullivan Co., TN)	

H4. *Lampetra appendix* (DeKay, 1842)
American brook lamprey

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	1940, UMMZ 132016;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
Laurel Creek	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1976, OSUM 43070;
SFHR (Washington Co., VA)	
Laurel Creek	
Beaverdam Creek	
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	
Watauga (Carter Co., TN)	1978, UT 2.77; 1988, UT 2.172, 173;
Beaver Creek	1973, UT 2.22;
Doe River	1988, UT 2.176;
Watauga (Sullivan Co., TN)	

H5. *Lepisosteus osseus* (Linnaeus, 1758)
longnose gar

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	1984, UT 25.30; 1986, TWRA 16.2;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
Laurel Creek	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
Laurel Creek	
Beaverdam Creek	
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	
Roan Creek	
Watauga (Carter Co., TN)	
Doe River	
Watauga (Sullivan Co., TN)	

H6. *Hiodon tergisus* Lesueur, 1818
mooneye

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	1977, UMMZ 201147; 1983, UT 36.13; 1984, UT 36.16;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
Laurel Creek	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
Laurel Creek	
Beaverdam Creek	
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	
Roan Creek	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H7. *Alosa pseudoharengus* (Wilson, 1811)
alewife

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	1986, TWRA 9.7;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
Laurel Creek	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
Laurel Creek	
Beaverdam Creek	
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	1990, UT 29.122;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	
Roan Creek	
Watauga (Carter Co., TN)	1984, UT 29.51; 1985, TWRA 9.5;
Watauga (Sullivan Co., TN)	

H8. *Dorosoma cepedianum* (Lesueur, 1818)
gizzard shad

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	1952, CU 23291;
HR (RM 0.0 - 52.3)	1953, CU 25534;
Mill Spring Branch	1953, CU 25623;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
Laurel Creek	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	1954, ANSP 74249;
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1965, ANSP 110717; 1974, ANSP 132152; 1980, ANSP 146037; 1987, VPI 06010102 020.01;
Laurel Creek	
Beaverdam Creek	
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	1980, ANSP 146078;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	
Roan Creek	
Watauga (Carter Co., TN)	
Doe River	
Watauga (Sullivan Co., TN)	

H9. *Dorosoma petenense* (Gunther, 1867)
threadfin shad

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1990, UT 29.114;
HR (RM 52.3-111)	1985, TWRA 9.6; 1986, TWRA 9.10; 1990, UT 29.114;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
Laurel Creek	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
Laurel Creek	
Beaverdam Creek	
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	
Roan Creek	
Watauga (Carter Co., TN)	1988, UT 29.109;
Doe River	
Watauga (Sullivan Co., TN)	

H10. *Campostoma anomalum* (Rafinesque, 1820)
central stoneroller

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110770; 1974, ANSP 132196; 1990, ANSP 168694; 1992, UAIC 10526.01; UT 44.5797;
Big Creek	1941, UMMZ 221696; 1990, UT 44.4964;
HR (RM 52.3-111)	1949, CU 44024;
Black Oak Branch	1941, UMMZ 221314;
Caney Creek	1941, UMMZ 221737;
Cedar Creek	1941, UMMZ 221620;
Cloud Creek	1941, UMMZ 221758;
Dodsons Creek	1941, UMMZ 221664;
Fall Creek	1941, UMMZ 222491;
German Creek	1941, UMMZ 221814;
Briar Fork	1978, INHS 79159;
Ray Creek	1941, UMMZ 221852;
Honeycutt Creek	1941, UMMZ 221646;
Kellar Creek	1941, UMMZ 221630;
May Spring Branch	1941, UMMZ 221900;
Mossy Creek	1941, UMMZ 221326; 1952, CU 23284, 24626; 1953, CU 25537, 44529, 44873;
Narrow Valley Creek	1941, UMMZ 221883;
Needmore Creek	1941, UMMZ 222503;
Noe Creek	1941, UMMZ 222463;
Panther Creek	1941, UMMZ 221343, 222450;
Panther Springs Creek	1952, CU 44477;
Poor Valley Creek	1941, UMMZ 221794; 1991, UT 44.5480;
Red House Branch	1941, UMMZ 221775;
Spring Creek	1941, UMMZ 221600;
Stubblefield Creek	1941, UMMZ 221584;
Turkey Creek	1941, UMMZ 169552;
Turley Spring	1941, UMMZ 221894;
War Creek	1941, UMMZ 222543;
HR (RM 0.0 - 52.3)	1991, UT 44.5378;
Buffalo Springs	1952, CU 23298, 23306; 1990, UT 44.5229;
Flat Creek	1990, UT 44.5079; 1991, UT 44.1548;
Lost Creek	1952, CU 23289; 1953, CU 25942;
Mill Spring Branch	1941, UMMZ 221861;
Richland Creek	
Roseberry Creek	1990, UT 44.5117;
Swanpond Creek	
North Fork (NFHR)	
NFHR (Bland Co., VA)	

H10. *Campostoma anomalum* (Rafinesque, 1820)
central stoneroller

Locality	Chronological Catalogue Numbers
NFHR (Smyth Co., VA)	1928, UMMZ 096893; 1940, CU 9972; 1954, ANSP 74194; UMMZ 169337; 1967, CU 63541; 1987, VPI 06010101 013.00
Beaver Creek	1928, UMMZ 096870;
Laurel Creek	1951, CU 20934; 1956, UMMZ 171319;
NFHR (Washington Co., VA)	1937, UMMZ 130778; 1954, ANSP 74221; 1978, OSU 42436; 1979, OSUM 38767; 1988, UAIC 8423.01; VPI 06010101 003.08; 1990, INHS 58992; 1992, UAIC 10522.01; 1993, UT 44.5982;
NFHR (Scott Co., VA)	1954, ANSP 74241; 1967, CU 62929; 1987, UAIC 7922.01;
Big Moccasin Creek	1938, UMMZ 129064
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46395; 1965, ANSP 110744; 1974, ANSP 132183; 1989, UT 44.4689; 1990, INHS 59007; 1991, UT 44.5361;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1954, UMMZ 169344; 169366; 1976, OSUM 43071, 43051; 1979, OSUM 38876; 1992, UAIC 10505.01;
Dicky Creek	1940, CU 9932;
SFHR (Washington Co., VA)	1947, UMMZ 157497; 1965, ANSP 110718; 1967, CU 63505; 1974, ANSP 132153; 1980, ANSP 146021; 1987, VPI 06010102 031.01;
Laurel Creek	1947, CU 19178; 1952, CU 21513, 21557; 1961, CU 37710;
Beaverdam Creek	1936, UMMZ 113297; 1981, UT 44.2410; 1982, UT 44.2689; 1991, UTRCF 44.5454;
Straight Creek	1967, CU 63437;
SFHR (Sullivan Co., TN)	1947, UMMZ 157507, 157545, 157566, 157600; 1949, UMMZ 159006; 1974, ANSP 132165, 132171; 1980, ANSP 146019, 146043, 146071, 146081; 1990, ANSP 168681, 168689;
Beaver Creek	1928, UMMZ 096859; 1953, CU 25615, 25727;
Horse Creek	1991, UT 44.5602;
Walker Fork	1993, UT 44.5602;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1938, UMMZ 129091; 1940, CU 9943, 9957; 1952, CU 21494, 21538; 1956, UMMZ 171349; 1961, CU 37899, 38090; 1962, CU 41841, 47909; 1970, UAIC 3799.10; 1993, UT 44.5953;
Bear Creek	1938, UMMZ 129100; 1976, OSUM 43058; 1990, UT 44.5784;
Hungry Mother Creek	1938, UMMZ 129116; 1971, UAIC 3997.02;
MFHR (Washington Co., VA)	
Byer Creek	1990, UT 44.5702;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183658, 183664, 183668, 183678, 1985, UAIC, 9506.01; 1991, UT 44.5475;

H10. *Campostoma anomalum* (Rafinesque, 1820)
central stoneroller

Locality	Chronological Catalogue Numbers
Cove Creek	1964, UMMZ 183581, 183584, 183590,
Watauga (Johnson Co., TN)	1947, UMMZ 157481;
Blue Springs	1947, UMMZ 157382;
Doe Creek	1947, UMMZ 157467; 1977, UT 44.3294;
Roan Creek	1947, UMMZ 157435; 1977, UT 44.3238;
Watauga (Carter Co., TN)	1937, UMMZ 130825; 1947, UMMZ 157390, 157398; 1991, UT 44.5376;
Doe River	1953, CU 24515; 1988, UT 44.4790;
Elk River	1947, UMMZ 157419; 1977, UT 44.2919; 1992, UAIC 10486.01;
Stony Creek	1991, UT 44.5356;
Watauga (Sullivan Co., TN)	

H11. *Clinostomus funduloides* Girard, 1856
rosyside dace

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
Laurel Creek	1993, UT 44.5990;
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
Laurel Creek	
Beaverdam Creek	
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183665;
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1974, ANSP 132197; 1980, ANSP 146094; 1987, TWRA 11.261; 1990, UT 44.4977; 1992, UT 44.5798;
Beech Creek	1990, UT 44.4803;
Big Creek	1941, UMMZ 221707; 1990, UT 44.4965;
HR (RM 52.3-111)	1941, UMMZ 222516;
Caney Creek	1941, UMMZ 221738;
Cedar Creek	1941, UMMZ 221609;
Cloud Creek	1941, UMMZ 221745;
Crockett Creek	1941, UMMZ 221711;
Kellar Creek	1941, UMMZ 221634;
Needmore Creek	1941, UMMZ 222499;
Poor Valley Creek	1987, TWRA 11.285; 1991, UT 44.5481;
Red House Creek	1941, UMMZ 221765;
Spring Creek	
Stubblefield Creek	1941, UMMZ 221579;
War Creek	1941, UMMZ 222530;
HR (RM 0.0 - 52.3)	1977, UMMZ 201150;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1867, ANSP 3381-3444; (Paratopotypes); MCZ 32255 (Paratopotype); USNM 14981 (Lectotype); 1888, USNM 125181; 1928, UMMZ 096891 (Topotypes); 1940, CU 9965, UMMZ 138547; 1951, CU 20694; 1954, ANSP 74182; UMMZ 16933; 1958, UAIC 2571.05; 1967, CU 63546; 1987, VPI 06010101 013.00; 1993, UT 44.5979;
Beaver Creek	1928, UMMZ 096868, 096869;
NFHR (Washington Co., VA)	1937, UMMZ 130770, 130785; 1954, ANSP 74225; 1978, OSUM 42094, 42439; 1979, OSUM 38770; 1988, UAIC 8423.02; VPI 06010101 003.08; 1990, INHS 58999; 1992, UAIC 10522.02;
NFHR (Scott Co., VA)	1954, ANSP 74243; 1967, CU 62934; 1987, UAIC 7922.07;
Big Moccasin Creek	1938, UMMZ 129058;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46403; 1984, TWRA 11.54; 1989, UT 44.4697; 1990, INHS 59012; 1991, UT 44.5362;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1947, UMMZ 157492; 1965, ANSP 110724; 1974, ANSP 132156; 1980, ANSP 146025;
Laurel Creek	1952, CU 21556;

Locality	Chronological Catalogue Numbers
SFHR (Sullivan Co., TN)	1947, UMMZ 157522, 157539, 157569, 157603, 1974, ANSP 132174, 132188; 1980, ANSP 146018, 146068, 146077; 1985, TWRA 11.76; 1990, ANSP 168678;
Horse Creek	1990, ANSP 168712;
Indian Creek	1940, UMMZ 201910;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1938, UMMZ 129093; 1940, CU 9958; 1946, CU 9946; 1952, CU 21563; 1956, UMMZ 171340; 171348; 1961, CU 38092;
Bear Creek	1938, UMMZ 129102;
Hungry Mother Creek	1938, UMMZ 129112; 1971, UAIC 3997.01;
MFHR (Washington Co., VA)	1993, UT 44.5963;
Byer Creek	1990, UT 44.5703;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183671, 183679, 1985, UAIC 9506.02; 1991, UT 44.5476;
Cove Creek	1964, UMMZ 183588, 183592; 1980, UAIC 9425.01;
Watauga (Johnson Co., TN)	1947, UMMZ 157479; 1986, TWRA 11.100;
Roan Creek	1947, UMMZ 157438;
Watauga (Carter Co., TN)	1937, UMMZ 130828; 1947, UMMZ 157394; 1958, UT 44.325; 1986, TWRA 11.98;
Doe River	1953, CU 24502; 1984, UT 44.3174; 1989, UT 44.4794;
Elk River	1947, UMMZ 157411; 1977, UT 44.1728;
Watauga (Sullivan Co., TN)	

H13.

Cyprinella monacha (Cope, 1868)
spotfin chub

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1867, ANSP 2036-2040 (syntypes); 1888, USNM 40475; 1954, ANSP 74181;
NFHR (Washington Co., VA)	1981, RC NMB 612, 613, 614; 1982, RC REJ 949, 950, 951; 1988, VPI 06010101 003.08; 1990, INHS 59000;
NFHR (Scott Co., VA)	1970, RC REJ 376; 1972, RC REJ 552, 568, 569; TVA 68.6; 1974, TU 96409; 1975, USNM 231356; 1976, TVA 68.27; 1981, RC REJ 928, 931; 1982, RC REJ 947; 1987, UAIC 7922.03;
NFHR (Hawkins/Sullivan Co., TN)	1954, CU 50382; UMNH 17606; USNM 177657; 1963, CU 46397; 1975, USNM 231355; 1977, TVA 68.21;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1947, UMMZ 157506, 157534, 157561, 157595;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	1984, RC WHH 302;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1974, ANSP 132200; 1987, TWRA 11.260; 1990, UT 44.4976; 1992, UT 44.5799;
Beech Creek	1941, UMMZ 221683; 1990, UT 44.4804;
Big Creek	1941, UMMZ 221705;
HR (RM 52.3-111)	1941, UMMZ 222524;
Black Oak Branch	1941, UMMZ 221310;
Caney Creek	1941, UMMZ 221735;
Cedar Creek	1941, UMMZ 221622;
Cloud Creek	1941, UMMZ 221757;
Crockett Creek	1941, UMMZ 221712;
Dodsons Creek	1941, UMMZ 221663;
Fall Creek	1941, UMMZ 222484;
German Creek	
Briar Fork	1941, UMMZ 221809; 1978, INHS 79160;
Ray Creek	1941, UMMZ 221856;
Kellar Creek	1941, UMMZ 221631;
May Spring Branch	1941, UMMZ 221907;
Mossy Creek	1952, CU 23290;
Narrow Valley Creek	1941, UMMZ 221878;
Needmore Creek	1941, UMMZ 222504;
Noe Creek	1941, UMMZ 222461;
Panther Creek	1941, UMMZ 221339, 222447;
Poor Valley Creek	1941, UMMZ 221799; 1991, UT 44.5488;
Red House Branch	1941, UMMZ 221776;
Spring Creek	1941, UMMZ 221606;
Stubblefield Creek	1941, UMMZ 221578;
Turkey Creek	1941, UMMZ 169547;
Turley Spring	1941, UMMZ 221897;
War Creek	1941, UMMZ 222532;
HR (RM 0.0 - 52.3)	1953, CU 25533; 1987, TWRA 11.253; 1991, UT 44.5379;
Beaver Creek	1953, CU 25620, 25729;
Mill Spring Branch	1941, UMMZ 221875;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	1937, UMMZ 130787;
NFHR (Scott Co., VA)	1954, ANSP 74233; 1987, UAIC 7922.19;
NFHR (Hawkins/Sullivan Co., TN)	1989, UT 44.4700; 1991, UT 44.5363;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	

Locality	Chronological Catalogue Numbers
SFHR (Washington Co., VA)	1947, UMMZ 157493; 1987, VPI 06010102 020.01;
SFHR (Sullivan Co., TN)	1961, UT 44.284; 1962, UT 44.250; 1966, UT 44.11; 1984, TWRA 11.35; 1985, TWRA 11.74;
Horse Creek	1990, ANSP 168701, 168717;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1940, CU 28495; 1952, CU 28494;
MFHR (Washington Co., VA)	1993, UT 44.5968;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	1977, UT 44.1723; 1985, TWRA 11.64;
Watauga (Carter Co., TN)	
Elk River	1977, UT 44.1724; 1978, UT 44.2950;
Watauga (Sullivan Co., TN)	1987, TWRA 11.293;

H15. *Cyprinus carpio* Linnaeus, 1758
common carp

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110759; 1987, TWRA 11.259;
HR (RM 52.3-111)	1986, TWRA 11.106, 11.108;
Honeycutt Creek	1941, UMMZ 221647;
Mossy Creek	1952, CU 23283; 1953, CU 25538;
Busby Creek	1941, UMMZ 222437;
Spring Creek	1941, UMMZ 221598;
Turkey Creek	1941, UMMZ 169551
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	1954, ANSP 74220; 1988, VPI 06010101 003.08;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1987, VPI 06010102 020.01;
SFHR (Sullivan Co., TN)	1965, ANSP 110745, 110755;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H16. *Erimystax cahni* (Hubbs and Crowe)
slender chub

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	1941, UMMZ 209536;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H17. *Erimystax dissimilis* (Kirtland, 1840)
streamline chub

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1987, TWRA 11.254, 11.264; 1990, UT 44.4990; 1991, UT 44.5387; 1992, UAIC 10526.02;
HR (RM 52.3-111)	1941, UMMZ 222512;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096883
NFHR (Washington Co., VA)	1976, UT 44.3139; 1977, UT 44.4269; 1988, UAIC 8423.03; 1992, UAIC 10522.03; 1993, UT 44.5985;
NFHR (Scott Co., VA)	1967, CU 62931; 1987, UAIC 7922.02;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46401; 1968, UT 44.271; 1984, TWRA 11.57; 1989, UT 44.4691; 1991, UT 44.5364;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1947, UMMZ 157562, 157593; 1974, ANSP 132184;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1961, CU 38088;
MFHR (Washington Co., VA)	1993, UT 44.5962;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	1888, USNM 39929; 1937, UMMZ 130823;
Watauga (Sullivan Co, TN)	

H18. *Erimystax insignis* (Hubbs and Crowe, 1956)
blotched chub

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1964, TU 34581;
SFHR (Sullivan Co., TN)	1947, UMMZ 157511 (Paratype), 157535 (Paratype), 157563 (Paratype), 157594 (Paratypes),
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	1947, UMMZ 157433 (Paratypes)
Watauga (Carter Co., TN)	
Elk River	1947, UMMZ 157415 (Paratype);
Stony Creek	
Watauga (Sullivan Co., TN)	

H19. *Hybopsis amblops* (Rafinesque, 1820)
bigeye chub

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1990, UT 44.4991; 1992, UAIC 10526.03;
Beech Creek	1941, UMMZ 221678; 1990, UT 44.4809;
Big Creek	1941, UMMZ 221703; 1990, UT 44.4966;
HR (RM 52.3-111)	1941, UMMZ 222513;
Black Oak Branch	1941, UMMZ 221317;
Caney Creek	1941, UMMZ 221733;
Cedar Creek	1941, UMMZ 221608;
Cloud Creek	1941, UMMZ 221759;
Crockett Creek	1941, UMMZ 221716;
Dodsons Creek	1941, UMMZ 221650;
Fall Creek	1941, UMMZ 222487;
German Creek	
Briar Fork	1941, UMMZ 221882;
Ray Creek	1941, UMMZ 221848;
Kellar Creek	1941, UMMZ 221629;
May Spring Branch	1941, UMMZ 221906;
Needmore Creek	1941, UMMZ 222494;
Noe Creek	1941, UMMZ 222456;
Panther Creek	1941, UMMZ 221347, 222452;
Poor Valley Creek	1941, UMMZ 221781;
Red House Branch	1941, UMMZ 221767;
Spring Creek	1941, UMMZ 221592;
Turkey Creek	1941, UMMZ 169554;
Turley Spring	1941, UMMZ 221886;
War Creek	1941, UMMZ 222529;
HR (RM 0.0 - 52.3)	1991, UT 44.5380;
Mill Spring Branch	1941, UMMZ 221860;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096894; 1954, ANSP 74185; 1967, CU 63542; 1987, VPI 06010101 013.00;
Beaver Creek	1928, UMMZ 096864;
Laurel Creek	1956, UMMZ 171322;
NFHR (Washington Co., VA)	1937, UMMZ 130775; 1954, ANSP 74223; 1976, UT 44.3137; 1988, UAIC 8423.05; 1992, UAIC 10522.04; 1993, UT 44.5989;
NFHR (Scott Co., VA)	1954, ANSP 74237; 1967, CU 62930;
Big Moccasin Creek	1938, UMMZ 129065;
NFHR (Hawkins/Sullivan Co., TN)	1989, UT 44.4690; 1991, UT 44.4690;
South Fork (SFHR)	

H19. *Hybopsis amblops* (Rafinesque, 1820)
bigeye chub

Locality	Chronological Catalogue Numbers
SFHR (Smyth Co., VA)	1888, UMMZ 061488; USNM 067956;
SFHR (Washington Co., VA)	1947, UMMZ 157488; 1965, ANSP 110720; 1974, ANSP 132154, 132172; 1980, ANSP 146022; 1987, VPI 06010102 031.01;
SFHR (Sullivan Co., TN)	1947, UMMZ 157510, 157536, 157560, 157596;
Horse Creek	1990, ANSP 168705, 168710; 1992, UT 44.5603;
Walker Fork	1992, UT 44.5603;
Sinking Creek	1978, UT 44.1698;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1938, UMMZ 129097; 1940, CU 9944 9956; 1952, CU 21560; 1956, UMMZ 171346; 1961, CU 37893;
Hungry Mother Creek	1938, UMMZ 129114;
MFHR (Washington Co., VA)	1993, UT 44.5964;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	1947, UMMZ 157474;
Roan Creek	1947, UMMZ 157432; 1977, UT 44.1693;
Watauga (Carter Co., TN)	1937, UMMZ 130824; 1947, UMMZ 157390;
Doe River	1953, CU 24508; 1984, UT 44.3169; 1988, UT 44.4791;
Elk River	1947, UMMZ 157417; 1978, UT 44.1712;
Watauga (Sullivan Co., TN)	

H20. *Luxilus chrysocephalus* Rafinesque, 1820
striped shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110762; 1980, ANSP 146095; 1992, UT 44.5800;
Beech Creek	1941, UMMZ 221681; 1990, UT 44.4800;
Big Creek	1941, UMMZ 221704; 1990, UT 44.4967;
HR (RM 52.3-111)	1941, UMMZ 222515;
Black Oak Branch	1941, UMMZ 221311;
Caney Creek	1941, UMMZ 221729;
Cedar Creek	1941, UMMZ 221619;
Cloud Creek	1941, UMMZ 221752;
Crockett Creek	1941, UMMZ 221719;
Dodsons Creek	1941, UMMZ 221669;
Fall Creek	1941, UMMZ 222488;
German Creek	
Briar Fork	1941, UMMZ 221818;
Ray Creek	1941, UMMZ 221845;
Honeycutt Creek	1941, UMMZ 221649;
Kellar Creek	1941, UMMZ 221635;
May Spring Branch	1941, UMMZ 221899;
Mossy Creek	1941, UMMZ 221325;
Narrow Valley Creek	1941, UMMZ 221879;
Needmore Creek	1941, UMMZ 222501;
Noe Creek	1941, UMMZ 222470;
Panther Creek	1941, UMMZ 221338, 222448;
Poor Valley Creek	1941, UMMZ 221791;
Red House Branch	1941, UMMZ 221773;
Spring Creek	1941, UMMZ 221587;
Stubblefield Creek	1941, UMMZ 221582;
Turkey Creek	1941, UMMZ 169545;
Havley Spring Branch	1941, UMMZ 222477;
Turley Spring	1941, UMMZ 221895;
War Creek	1941, UMMZ 222535;
HR (RM 0.0 - 52.3)	1991, UT 44.5381;
Beaver Creek	1953, CU 25730;
Flat Creek	1976, INHS 75138; 1990, UT 44.5080; 1991, UT 44.5269;
Mill Spring Branch	1941, UMMZ 221871;
Roseberry Creek	1990, UT 44.5118;
North Fork (NFHR)	
NFHR (Bland Co., VA)	1933, USNM 102429;
NFHR (Smyth Co., VA)	1928, UMMZ 096887; 1940, CU 9969; 1954, ANSP 74197; UMMZ 169332; 1961, CU 38070; 1967, CU 63544; 1987, VPI 06010101 013.00; 1993, UT 44.5987;

H20.

Luxilus chrysocephalus Rafinesque, 1820
striped shiner

Locality	Chronological Catalogue Numbers
Laurel Creek	1956, UMMZ 171321;
NFHR (Washington Co., VA)	1937, UMMZ 130769, 130784, 130806; 1954, ANSP 74231; 1978, OSUM 42093, 42437; 1979, OSUM 38769; 1988, UAIC 8423.06; VPI 06010101 003.08; 1990, INHS 58993;
NFHR (Scott Co., VA)	1954, ANSP 74245; 1987, UAIC 7922.05;
Big Moccasin Creek	1938, UMMZ 129059;
NFHR (Hawkins/Sullivan Co., TN)	1989, UT 44.4694;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1947, UMMZ 157495;
SFHR (Sullivan Co., TN)	1947, UMMZ 157526, 157537, 157573, 157601, 1965, ANSP 110747; 1974, ANSP 132166, 132173, 132186; 1980, ANSP 146017, 146070; 1989, UT 44.4694; 1990, ANSP 168709, 1991, UT 44.4694;
Beaver Creek	1928, UMMZ 096856;
Horse Creek	1961, CU 38075; 1992, UT 44.5604;
Walker Fork	1992, UT 44.5604;
Reedy Creek	1977, UT 44.1501;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1938, UMMZ 129094; 1940, CU 9951, 9952; 1952, CU 21542, 21562; 1956, UMMZ 171347; 1961, CU 37895, 38085, 38093; 38087; 1970, UAIC 3799.01; 1993, UT 44.5967;
Bear Creek	1867, ANSP 2835-2839; 1938, UMMZ 129103; 1976, OSU 43059; 1990, UT 44.5786;
Hungry Mother Creek	1938, UMMZ 129110; 1971, UAIC 3997.03;
MFHR (Washington Co., VA)	1888, USNM 067963; 1993, UT 44.5967;
Byer Creek	1990, UT 44.5704;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	1947, UMMZ 157441; 1977, UT 44.1717;
Watauga (Carter Co., TN)	1937, UMMZ 130830;
Watauga (Sullivan Co., TN)	

H21.

Luxilus coccogenis (Cope, 1868)
warpaint shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1987, TWRA 11.263; 1992, UAIC 10526.04; UT 44.5801;
Beech Creek	1990, UT 44.4801;
Big Creek	1941, UMMZ 221698; 1990, UT 44.4968;
HR (RM 52.3-111)	
German Creek	
Briar Fork	1941, UMMZ 221815;
Ray Creek	1941, UMMZ 221851;
Narrow Valley Creek	1941, UMMZ 221885;
Poor Valley Creek	1941, UMMZ 221801;
HR (RM 0.0 - 52.3)	
Flat Creek	1976, INHS 75141; 1986, TWRA 11.133;
Beaver Creek	1953, CU 25621, 25733;
Mill Spring Branch	1941, UMMZ 221858;
Roseberry Creek	1990, UT 44.5119;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1867, ANSP 3561-3650 (Lectoparatypes), 5379 (Lectoparatypes); BMNH 1868.1.10.3 (Lectoparatypes); MCZ 35653 (Lectoparatypes); MNHN 4852 (Lectoparatypes); (USNM 36849 (Lectotype); 1928, UMMZ 096888; 1951, CU 20695; 1954, ANSP 74201; UMMZ 169334; 1961, CU 38072; 1967, CU 63545; 1979, OSUM 38840;
Beaver Creek	1928, UMMZ 096867;
Laurel Creek	1951, CU 20930; 1956, UMMZ 171323;
Lick Creek	1993, UT 44.5983;
Locust Cove Creek	1993, UT 44.5983;
NFHR (Washington Co., VA)	1937, UMMZ 130774; 1978, OSUM 42438; 1988, UAIC 8423.07; 1990, INHS 59001; 1992, UAIC 10522.05; 1993, UT 44.5983;
NFHR (Scott Co., VA)	1954, ANSP 74238; 1967, CU 62933; 1987, UAIC 7922.06;
Big Moccasin Creek	1938, UMMZ 129060; 1979, OSUM 38823;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46400; 1989, UT 44.4695; 1991, UT 44.4695, 44.5365;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1888, CU 72010; USNM 067959, 179887;
SFHR (Washington Co., VA)	1947, UMMZ 157491; 1961, CU 37708; 1965 ANSP 110723; 1967, CU 63506; 1974, ANSP 132155; 1980, ANSP 146026;

H21.

Luxilus coccogenis (Cope, 1868)
warpaint shiner

Locality	Chronological Catalogue Numbers
Laurel Creek	1952, CU 21515, 21558;
Beaverdam Creek	1936, UMMZ 113300; 1938, UMMZ 119720, 119723; 1981, UT 44.2412; 1982, UT 44.2691; 1986, TWRA 11.115, 11.138;
SFHR (Sullivan Co., TN)	1947, UMMZ 157521, 157538, 157568, 157602; 1974, ANSP 132187; 1980, ANSP 146067;
Beaver Creek	1928, UMMZ 096855
Reedy Creek	1977, UT 44.1500;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1940, CU 9961; 1952, CU 21540, 21561; ; 1961, CU 38086; 1993, UT 44.5959;
MFHR (Washington Co., VA)	1888, USNM 067964, 179145, 1993, UT 44.5959;
Byer Creek	1990, UT 44.5705;
Hutton Creek	1992, UT 44.5812;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183666, 183670, 1967, INHS 82140; 1968, CU 53824; 1985, UAIC 9506.03; 1991, UT 44.5477;
Watauga (Johnson Co., TN)	1947, UMMZ 157478;
Roan Creek	1947, UMMZ 157436; 1977, UT 44.1485;
Watauga (Carter Co., TN)	1947, UMMZ 157399; 1950, CU 55808;
Doe River	1953, CU 24506; 1988, UT 44.4793;
Laurel Spring Creek	
Elk River	1947, UMMZ 157414; 1978, UT 44.2951; 1992, UAIC 10486.02;
Watauga (Sullivan Co., TN)	1987, TWRA 11.290;

H22.

Lythrurus ardens (Cope, 1868)
rosefin shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
Beech Creek	1990, UT 44.4799;
Big Creek	1990, UT 44.4974;
HR (RM 52.3-111)	
Dodsons Creek	1941, UMMZ 221671;
German Creek	
Briar Fork	1941, UMMZ 221827;
Ray Creek	1941, UMMZ 221847;
Honeycutt Creek	1941, UMMZ 221638;
Poor Valley Creek	1941, UMMZ 221784;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H23. *Macrhybopsis aestivalis* (Girard, 1856)
speckled chub

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	1967, UT 44.180; 1970, UT 44.501; 1992, UT 44.6022;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H25. *Macrhybopsis storeriana* (Kirtland, 1845)
silver chub

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	1993, UT 44.3150;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H25.

Nocomis micropogon (Cope, 1865)
river chub

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110760; 1990, ANSP 168693; 1992, UAIC 10526.05; UT 44.5802;
Beech Creek	1941, UMMZ 221684; 1990, UT 44.4810;
Big Creek	1941, UMMZ 221691; 1990, UT 44.4969;
HR (RM 52.3-111)	1941, UMMZ 222518;
Black Oak Branch	1941, UMMZ 221303;
Caney Creek	1941, UMMZ 221726;
Cedar Creek	1941, UMMZ 221621;
Cloud Creek	1941, UMMZ 221744;
Dodsons Cree	1941, UMMZ 221660;
Fall Creek	1941, UMMZ 222486;
German Creek	
Brair Fork	1941, UMMZ 221817;
Ray Creek	1941, UMMZ 221833;
Kellar Creek	1941, UMMZ 221626;
May Spring Branch	1941, UMMZ 221904;
Mossy Creek	1941, UMMZ 221324;
Narrow Valley Creek	1941, UMMZ 221880;
Needmore Creek	1941, UMMZ 222502;
Noe Creek	1941, UMMZ 222473;
Panther Creek	1941, UMMZ 221352, 222442;
Poor Valley Creek	1941, UMMZ 221802; 1991, UT 44.5482;
Spring Creek	1941, UMMZ 221593;
Stubblefield Creek	1941, UMMZ 221580;
Turkey Creek	1941, UMMZ 169550;
Turley Spring	1941, UMMZ 221896;
War Creek	1941, UMMZ 222526;
HR (RM 0.0 - 52.3)	1970, UT 44.503;
Beaver Creek	1953, CU 25614, 25725;
Mill Spring Branch	1941, UMMZ 221873;
Roseberry Creek	1990, UT 44.5213;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096895; 1940, CU 9970; 1951, CU 20693; 1954, ANSP 74198; UMMZ 169338; 1967, CU 63543; 1987, VPI 06010101 013.00; 1993, UT 44.5958;
Laurel Creek	1951, CU 20932; 1956, UMMZ 171324;
Lick Creek	1993, UT 44.5988;
NFHR (Washington Co., VA)	1937, UMMZ 130776; 1954, ANSP 74224; 1988, UAIC 8423.08; VPI 06010101 003.08; 1990, INHS 58994; 1992, UAIC 10522.06;

H25. *Nocomis micropogon* (Cope, 1865)
river chub

Locality	Chronological Catalogue Numbers
NFHR (Scott Co., VA)	1954, ANSP 74246; 1967, CU 62932; 1987, UAIC 7922.04;
Big Moccasin Creek	1938, UMMZ 129063;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46406; 1989, UT 44.4692; 1990, INHS 59008; 1991, UT 44.5366;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1888, USNM 067957; 1951, CU 20957;
SFHR (Washington Co., VA)	1947, UMMZ 157489; 1965, ANSP 110721; 1980, ANSP 146023;
Laurel Creek	1952, CU 21518, 21554; 1961, CU 37709;
Beaverdam Creek	1936, UMMZ 113298; 1938, UMMZ 119721; 1940, UMMZ 201894; 1981, UT 44.2411; 1982, UT 44.2690; 1986, TWRA 11.118;
SFHR (Sullivan Co., TN)	1947, UMMZ 157533, 157564, 157597; 1949, UMMZ 159005; 1965, ANSP 110738, 110746; 1974, ANSP 132185; 1980, ANSP 146009, 146069;
Beaver Creek	1928, UMMZ 096857;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1961, CU 38068, 38091, 1993, UT 44.5958;
Hungry Mother Creek	1938, UMMZ 129109;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183663, 183669, 183677, 1968, CU 53826; 1985, UAIC 9506.04; 1991, UT 44.5478;
Cove Creek	1964, UMMZ 183586, 183591; 1980, UAIC 9425.02;
Watauga (Johnson Co., TN)	1947, UMMZ 157475;
Roan Creek	1947, UMMZ 157443;
Watauga (Carter Co., TN)	1937, UMMZ 130822; 1947, UMMZ 157389;
Doe River	1953, CU 24514; 1988, UT 44.4792;
Elk River	1947, UMMZ 157416; 1977, UT 44.2953; 1978, UT 44.1711, 44.2948; 1992, UAIC 10486.03;
Watauga (Sullivan Co., TN)	

H26. *Notemigonus crysoleucas* (Mitchill, 1814)
golden shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
Poor Valley Creek	1987, TWRA 11.286; 11.289;
HR (RM 0.0 - 52.3)	
Flat Creek	1986, TWRA 11.134;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1966, UT 44.10; 1987, TWRA 11.292;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1993, UT 44.5957;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H27.

Notropis ariommus (Cope, 1868)
popeye shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1992, UT 44.5803;
HR (RM 52.3-111)	
Poor Valley Creek	1941, UMMZ 221782;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
Laurel Creek	
NFHR (Washington Co., VA)	1978, OSUM 42092; 1979, OSUM 38768; 1988, UAIC 8423.09; 1990, INHS 59002;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1989, UT 44.4693;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	1888, USNM 40527;
Watauga (Sullivan Co., TN)	

H28. *Notropis atherinoides* Rafinesque, 1818
emerald shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	1977, UMMZ 201149; 1993, UT 44.6006;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H29.

Notropis leuciodus (Cope, 1868)
Tennessee shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1987, TWRA 11.262; 1990, ANSP 168692; 1992, UAIC 10526.06; UT 44.5804;
Big Creek	1941, UMMZ 221702; 1990, UT 44.4970;
Beech Creek	1990, UT 44.4802;
HR (RM 52.3-111)	
Little Poor Valley Creek	1991, UT 44.5489;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1867, ANSP 2336 (Lectotype); 2337-2358 (Lectoparatype); MCZ 25161 (Lectoparatype); 1888, USNM 202267; 1928, UMMZ 096886; 1940, CU 10191; UMMZ 138508; 1951, CU 20696; 1954, ANSP 74193; UMMZ 169336; 1967, CU 63547; 1987, VPI 06010101 013.00; 1993, UT 44.5980;
Laurel Creek	1951, CU 20931; 1954, CU 28333; 1990, INHS 59003;
NFHR (Washington Co., VA)	1937, UMMZ 130772; 1976, UT 44.3138; 1979, OSU 38771; 1988, UAIC 8423.11; VPI 06010101 003.08; 1992, UAIC 10522.07;
NFHR (Scott Co., VA)	1987, UAIC 7922.08;
Big Moccasin Creek	1938, UMMZ 129062;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46399; 1984, TWRA 11.55; 1989, UT 44.4698; 1991, UT 44.4698, 44.5367;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1888, UMMZ 108532 USNM 067961, 067993; ; 1951, CU 20958;
SFHR (Washington Co., VA)	1947, UMMZ 157494; 1961, CU 37705; 1965, ANSP 110725; 1967, CU 63507; 1980, ANSP 146028;
Laurel Creek	
Beaverdam Creek	1986, TWRA 11.116;
Straight Creek	1967, CU 63438;
SFHR (Sullivan Co., TN)	1947, UMMZ 157523, 157540, 157572, 157605; 1949, 159004; 1980, ANSP 146066;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1993, UT 44.5960;
MFHR (Washington Co., VA)	1888, USNM 067965, 179146;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183672, 1985, UAIC 9506.05; 1991, UTRCF 44.5479;
Cove Creek	1964, UMMZ 183587, 183593; 1980, UAIC 9425.03;
Watauga (Johnson Co., TN)	1947, UMMZ 157477;

H29.

Notropis leuciodus (Cope, 1868)
Tennessee shiner

Locality	Chronological Catalogue Numbers
Doe Creek	1969, UT 44.418;
Roan Creek	1947, UMMZ 157437;
Watauga (Carter Co., TN)	1937, UMMZ 130826; 1947, UMMZ 157396
Doe River	1953, CU 24507; 1988, UT 44.4795;
Elk River	1947, UMMZ 157412; 1978, UT 44.2949; 1992, UAIC 10486.04;
Watauga (Sullivan Co., TN)	

H30.

Notropis photogenis (Cope, 1865)
silver shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1987, TWRA 11.255; 1990, UT 44.4992;
HR (RM 52.3-111)	1941, UMMZ 222507;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1954, ANSP 74195; 1958, UAIC 2571.04; 1967, CU 63548;
NFHR (Washington Co., VA)	1954, ANSP 74229; 1988, UAIC 8423.10;
NFHR (Scott Co., VA)	1954, ANSP 74236; 1987, UAIC 7922.09;
NFHR (Hawkins/Sullivan Co., TN)	1989, UT 44.4696; 1991, UT 44.5368;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1967, CU 63508; 1980, ANSP 146024, 146063;
SFHR (Sullivan Co., TN)	1947, UMMZ 157574, 157606;
Kendrick Creek	1940, UMMZ 201905;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1961, CU 38080;
MFHR (Washington Co., VA)	1888, UMMZ 187283; 1993, UT 44.5961;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	1973, UT 44.735; 1977, UT 44.1721; 1978, UT 44.1714; 1986, TWRA 11.101;
Roan Creek	1947, UMMZ 157440; 1977, UT 44.1716; 1978, UT 44.1730;
Watauga (Carter Co., TN)	1888, UMMZ 187288; 1949, CU 24006; 1950, CU 24000; 1986, TWRA 11.99; 1988, UT 44.4786;
Doe River	1953, CU 24512; 1988, UT 44.4796;
Elk River	1947, UMMZ 157420; 1977, UT 44.1722; 1978, UT 44.1715;
Watauga (Sullivan Co., TN)	

H31. *Notropis rubellus* (Agassiz, 1850)
rosyface shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1974, ANSP 132198; 1987, TWRA 11.258; 1990, UT 44.4978; 1992, UT 44.5806;
Big Creek	1941, UMMZ 221688;
HR (RM 52.3-111)	1941, UMMZ 222514;
Caney Creek	1941, UMMZ 221741;
Cedar Creek	1941, UMMZ 221611;
Cloud Creek	1941, UMMZ 221743;
Fall Creek	1941, UMMZ 222485;
German Creek	
Briar Fork	1941, UMMZ 221810;
Ray Creek	1941, UMMZ 221850;
Noe Creek	1941, UMMZ 222462;
Panther Creek	1941, UMMZ 221335;
Poor Valley Creek	1941, UMMZ 221789;
Spring Creek	1941, UMMZ 221590;
Turkey Creek	1941, UMMZ 222861;
HR (RM 0.0 - 52.3)	1985, UT 44.4827;
Mill Spring Branch	1941, UMMZ 221857;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1867, ANSP 2842; 2843. 1928, UMMZ 096892; 1951, CU 50591; 1954, ANSP 74186; 1961, CU 38071; 1967, CU 63549;
NFHR (Washington Co., VA)	1978, OSUM 42095, 42440; 1979, OSUM 38772; 1988, UAIC 8423.12;
NFHR (Scott Co., VA)	1954, ANSP 74239; 1967, CU 62935; 1987, UAIC 7922.10;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46404; 1989, UT 44.4702;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1947, UMMZ 157541, 157567, 157604, 1974, ANSP 132189; 1980, ANSP 146064;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1962, CU 41840;
MFHR (Washington Co., VA)	1888, UMMZ 192575;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	1947, UMMZ 157393;
Elk River	1947, UMMZ 157409;

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1990, UT 44.4993;
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	1993, UT 44.5981;
NFHR (Smyth Co., VA)	1987, VPI 06010101 013.00; 1993, UT 44.5981;
Locust Cove Creek	1993, UT 44.5981;
NFHR (Washington Co., VA)	1937, UMMZ 130771;
Tumbling Creek	1867, ANSP 2907 (Lectotype); ANSP 2908-2917 (Lctoparatopotypes).
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1888, USNM 067992; 1951, CU 20955; 1954, UMMZ 169364; 1976, OSUM 43072, 43052; 1992, UAIC 10505.02;
Dickey Creek	1940, CU 9929; UMMZ 138546;
SFHR (Washington Co., VA)	1961, CU 37703; 1987, VPI 06010102 031.01;
Laurel Creek	1940, UMMZ 201888; 1947, CU 19180; 1952, CU 21519;
Beaverdam Creek	1936, UMMZ 113299; 1938, UMMZ 119719, 119724; 1940, UMMZ 201884; 1981, UT 44.2413; 1982, UT 44.2692; 1986, TWRA 11.119, 11.139;
SFHR (Sullivan Co., TN)	1947, UMMZ 157508;
Beaver Creek	1928, UMMZ 096854;
Clark Branch	1989, UT 44.4510;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1938, UMMZ 129092; 1940, CU 9948, 9954, ; UMMZ 138545; 1952, CU 21541; 1961, CU 37892; 1962, CU 41845; 1993, UT 44.5955;
Bear Creek	1938, UMMZ 129104, 1976, OSUM 43060; 1990, UT 44.5788;
Hungry Mother Creek	1938, UMMZ 129113; 1971, UAIC 3997.08;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	1978, UT 44.1691, 44.1718;
Watauga (Carter Co., TN)	
Doe River	1985, UT 44.3170; 1988, UT 44.4797;
Laurel Fork Creek	1985, UT 44.3179;
Little Doe River	1985, UT 44.3183;

H32.

Notropis rubricroceus (Cope, 1868)
saffron shiner

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Locality	Chronological Catalogue Numbers
Stony Creek	1940, UMMZ 201939; 1991, UT 44.5372;
Little Stoney Creek	1969, UT 44.404;
Watauga (Sullivan Co., TN)	

H34. *Notropis spectrunculus* (Cope, 1868)
mirror shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1888, UMMZ 212456; 1954, UMMZ 169347;
SFHR (Washington Co., VA)	1885, USNM 3149234; 1987, VPI 06010102 031.01;
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1952, CU 21537; 1956, UMMZ 171351; 1961, CU 37897;
Bear Creek	1867, ANSP 4363-4373 (Syntypes).
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	1947, UMMZ 157480;
Roan Creek	1947, UMMZ 157442;
Watauga (Carter Co., TN)	1947, UMMZ 157395;
Elk River	1940, UMMZ 201863; 1947, UMMZ 157410;
Watauga (Sullivan Co., TN)	

H33.

Notropis cf. spectrunculus
sawfin shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1974, ANSP 132199; 1987, TWRA 11.257; 1990, UT 44.4994; 1991, UT 44.5388; 1992, UAIC 10526.07;
Big Creek	1941, UMMZ 221708;
HR (RM 52.3-111)	1941, UMMZ 222521;
Caney Creek	1941, UMMZ 221742;
Cedar Creek	1941, UMMZ 221623;
Cloud Creek	1941, UMMZ 221755;
Crockett Creek	1941, UMMZ 221717;
Dodsons Creek	1941, UMMZ 221654;
German Creek	
Ray Creek	1941, UMMZ 221841;
Kellar Creek	1941, UMMZ 221628;
Needmore Creek	1941, UMMZ 222500;
Noe Creek	1941, UMMZ 222458;
Panther Creek	1941, UMMZ 221336, 222445;
Poor Valley Creek	1941, UMMZ 221797;
Spring Creek	1941, UMMZ 221589;
Turkey Creek	1941, UMMZ 222863;
War Creek	1941, UMMZ 222533;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096889; 1951, CU 20698; 1954, ANSP 74187;
NFHR (Washington Co., VA)	1954, ANSP 74227; 1978, OSUM 42097; 1979, OSU 38774; 1988, UAIC 8423.14; VPI 06010101 003.08; 1992, UAIC 10522.09;
NFHR (Scott Co., VA)	1954, ANSP 74234; 1967, CU 62936; 1987, UAIC 7922.12;
NFHR (Hawkins/Sullivan Co., TN)	1968, UT 44.270; 1989, UT 44.4699; 1991, UT 44.5369;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1947, UMMZ 157525, 157543, 157608, 1974, ANSP 132175; 1980, ANSP 146015, 146062;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	1937, USNM 109482;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	

H33.

Notropis cf. spectrunculus
sawfin shiner

Locality	Chronological Catalogue Numbers
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Elk River	1940, UMMZ 201862;
Watauga (Sullivan Co., TN)	

H35. *Notropis stramineus* (Cope, 1865)
sand shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
Beech Creek	1941, UMMZ 221676;
Terrill Creek	1975, UT 44.1127;
HR (RM 52.3-111)	
Black Oak Branch	1941, UMMZ 221306;
Caney Creek	1941, UMMZ 221739;
Cloud Creek	1941, UMMZ 221761;
Crockett Creek	1941, UMMZ 221710;
Dodsons Creek	1941, UMMZ 221655;
German Creek	
Ray Creek	1941, UMMZ 221837;
Honeycutt Creek	1941, UMMZ 221642;
Kellar Creek	1941, UMMZ 222785;
Poor Valley Creek	1991, UT 44.5483;
Turkey Creek	1941, UMMZ 169546;
War Creek	1941, UMMZ 222531;
HR (RM 0.0 - 52.3)	1980, UT 44.2851;
Flat Creek	1991, UT 44.5270;
Little Flat Creek	1991, UT 44.5270;
Swanpond Creek	1991, UT 44.5469;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1990, UT 44.5209;
Horse Creek	1990, ANSP 168700; 1992, UT 44.5605;
Indian Creek	1940, UMMZ 201911
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H36.

Notropis telescopus (Cope, 1868)
telescope shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1980, ANSP 146091; 1987, TWRA 11.256; 1993, UT 44.5805;
Beech Creek	1990, UT 44.4805;
Big Creek	1941, UMMZ 221685; 1990, UT 44.4971;
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1867, ANSP 2157 (Lectotype); ANSP 2158-2254 (Lectoparatypes), 2330-2335 (Lectoparatypes); BMNH 1868.1.10.18 (Lectoparatypes); MCZ 25160 (Lectoparatype); MNHN 4855 (Lectoparatype); 1928, UMMZ 096885; 1940, CU 9967; UMMZ 138509; 1951, CU 20697; 1954, ANSP 74196; UMMZ 169335; 1958, UAIC 2571.03; 1967, CU 63550; 1979, OSUM 38841; 1987, VPI 06010101 013.00;
Beaver Creek	1928, UMMZ 096866;
Laurel Creek	1951, CU 20929; 1954, CU 28334; 1956, UMMZ 171320;
NFHR (Washington Co., VA)	1937, UMMZ 130773; 130786; 1978, OSUM 42096, 42441; 1979, OSUM 38773; 1988, UAIC 8423.13; VPI 06010101 003.08; 1990, INHS 59004; 1992, UAIC 10522.08;
NFHR (Scott Co., VA)	1967, CU 62937; 1987, UAIC 7922.11;
Big Moccasin Creek	1938, UMMZ 129061; 1979, OSUM 38824;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46392; 1984, TWRA 11.56; 1989, UT 44.4701; 1991, UT 44.5370;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1888, UMMZ 187290; USNM 067960; 1954, UMMZ 169346, 169365; 1992, UAIC 10505.TA;
Dickey Creek	1940, CU 9931;
SFHR (Washington Co., VA)	1937, USNM 104063; 1947, UMMZ 157496; 1965, ANSP 110726; 1967, CU 63509; 1974, ANSP 132157; 1980, ANSP 146020; 1987, VPI 06010102 031.01;
Laurel Creek	1947, CU 19182; 1952, CU 21514; 1961, CU 38197;
SFHR (Sullivan Co., TN)	1947, UMMZ 157524, 157542, 157570, 157607; 1980, ANSP 146065; 1990 ANSP 168680, 168687;
Horse Creek	1990, ANSP 168711; 1992, UT 44.5606;
Kendrik Creek	1940, UMMZ 201906;
Middle Fork (MFHR)	

H36.

Notropis telescopus (Cope, 1868)
telescope shiner

Locality	Chronological Catalogue Numbers
MFHR (Smyth Co., VA)	1938, UMMZ 129095; 1940, CU 9939; UMMZ 138551; 1952, CU 21544; 1956, UMMZ 171350; 1958, UAIC 2570.03; 1961, CU 38082; 1970, UAIC 3799.03; 1993, UT 44.5956;
Bear Creek	1938, UMMZ 129101; 1976, OSUM 43061; 1990, UT 44.5787;
Hungry Mother Creek	1938, UMMZ 129111;
MFHR (Washington Co., VA)	1888, UMMZ 187284; 1937, USNM 104082;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	1947, UMMZ 157476;
Blue Springs	1947, UMMZ 157381;
Roan Creek	1947, UMMZ 157439; 1977, UT 44.1733;
Watauga (Carter Co., TN)	1888, UMMZ 187289; 1947, UMMZ 157397;
Doe River	1953, CU 24510; 1984, UT 44.3172; 1988, UT 44.4798;
Elk River	1937, UMMZ 130829, 1947, UMMZ 157413; 1977, UT 44.1729; 1978, UT 44.2952; 1992, UAIC 10486.05;
Stony Creek	1940, UMMZ 201940;
Watauga (Sullivan Co., TN)	

H37.

Notropis volucellus (Cope, 1865)
mimic shiner

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
Beech Creek	1941, UMMZ 221680; 1990, UT 44.4806;
Big Creek	1941, UMMZ 221689; 1990, UT 44.4975;
HR (RM 52.3-111)	1941, UMMZ 222508;
Caney Creek	1941, UMMZ 221734;
Cedar Creek	1941, UMMZ 221624;
Cloud Creek	1941, UMMZ 221760;
Crockett Creek	1941, UMMZ 221713;
Dodsons Creek	1941, UMMZ 221665;
Fall Creek	1941, UMMZ 222490;
German Creek	
Briar Fork Creek	1941, UMMZ 221811;
Ray Creek	1941, UMMZ 221840;
Honeycutt Creek	1941, UMMZ 221639;
Kellar Creek	1941, UMMZ 221627;
Narrow Valley Creek	1941, UMMZ 221876;
Needmore Creek	1941, UMMZ 222498;
Noe Creek	1941, UMMZ 222459;
Panther Creek	1941, UMMZ 221337, 222446;
Poor Valley Creek	1941, UMMZ 221787;
Red House Branch	1941, UMMZ 221768;
Spring Creek	1941, UMMZ 221591;
War Creek	1941, UMMZ 222534;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096890;
NFHR (Washington Co., VA)	1988, VPI 06010101 003.08; 1990, INHS 58995;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1990, INHS 59009;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1947, UMMZ 157590;
SFHR (Sullivan Co., TN)	1947, UMMZ 157571, 183959, 183960,
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	1937, USNM 104162;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	1947, UMMZ 183965;

H37.

Notropis volucellus (Cope, 1865)
mimic shiner

Locality	Chronological Catalogue Numbers
Watauga (Carter Co., TN)	1937, 130827; 1947, UMMZ 157392;
Elk River	1947, UMMZ 183964;
Watauga (Sullivan Co., TN)	

H38. *Phenacobius crassilabrum* Minckley and Craddock, 1962
fatlips minnow

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1967, CU 63510; 1970, UT 44.521; 1980, ANSP 146027;
SFHR (Sullivan Co., TN)	1947, UMMZ 157598;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	1947, UMMZ 157434 (Paratypes); 1977, UT 44.1487, 44.1701, 44.1704, 44.1708;
Watauga (Carter Co., TN)	1947, UMMZ 157391;
Doe River	1969, INHS 82566;
Elk River	1940, UMMZ 201861; 1947, UMMZ 157418 (Paratypes), 179151 (Holotype); 1969, UT 44.405; 1977, UT 44.1690, 44.2954; 1978, UT 44.1702;
Watauga (Sullivan Co., TN)	

H39.

Phenacobius uranops Cope, 1867
stargazing minnow

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1987, TWRA 11.265; 1991, UT 44.5389; 1992, UAIC 10526.08; UT 44.5807;
Big Creek	1941, UMMZ 221693;
HR (RM 52.3-111)	1941, UMMZ 222520;
Caney Creek	1941, UMMZ 221740;
Cloud Creek	1941, UMMZ 221750;
German Creek	
Ray Creek	1941, UMMZ 221844;
Panther Creek	1941, UMMZ 221354;
Turkey Creek	1941, UMMZ 169548;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096884 (Topotypes); 1951, CU 20692; 1954, ANSP 74183; 1967, CU 63551;
NFHR (Washington Co., VA)	1976, UT 44.3140; 1988, UAIC 8423.16; 1988, VPI 06010101 003.08; 1993, UT 44.5984;
NFHR (Scott Co., VA)	1967, CU 62938; 1987, UAIC 7922.13;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46393, 46398; 1984, TWRA 11.58; 1991, UT 44.5371;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1961, TU 35658, 69158; 1967, CU 63511;
SFHR (Sullivan Co., TN)	1947, UMMZ 157544, 157565, 157599,
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	1993, UT 44.5965;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	1888, UMMZ 192567;
Watauga (Sullivan Co., TN)	

H40.

Phoxinus oreas (Cope, 1868)
mountain redbelly dace

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
Surgoinsville Creek	
Terrill Creek	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
Flat Creek	
Unnamed Tributary	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
Lick Creek	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
Laurel Creek	1993, UT 44.6108;
Beaverdam Creek	
SFHR (Sullivan Co., TN)	
Hatcher Creek	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H41. *Phoxinus tennesseensis* Starnes and Jenkins, 1988
Tennessee dace

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
Surgoinsville Creek	1975, UMMZ 198977 (Paratypes); USNM 216212 (Paratypes);
Terrill Creek	1975, UF 21802 (Paratypes); 1976, UAIC 5230.01 (Paratypes); 1990, TWRA (?);
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
Flat Creek	
Brice Branch	1991, UT 44.5266;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
Lick Creek	1973, RC MES 23; 1976, RC REJ 752;
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
Laurel Creek	
Beaverdam Creek	1978, UT 44.1700; 1982, UT 44.2693;
SFHR (Sullivan Co., TN)	
Hatcher Creek	1993, UT 44.5820;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1973, TC TVA 43;
Bear Creek	1867, ANSP 22112, 22113; 1972, RC JRS 1, 2; 1974, RC REJ 666, 667; TU 97995; 1990, UT 44.5789;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	1940, UMMZ 201860; 1973, UT 44.736;
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H42.. *Pimephales notatus* (Rafinesque, 1820)
bluntnose minnow

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110763; 1974, ANSP 132202; 1980, ANSP 146090; 1990, UT 44.4979;
Beech Creek	1990, UT 44.4807;
HR (RM 52.3-111)	
Briar Fork	1978, INHS 79161;
Cloud Creek	1941, UMMZ 221748;
Dodsons Creek	1941, UMMZ 221667;
Mossy Creek	1990, UT 44.4979;
Poor Valley Creek	1941, UMMZ 221786; 1987, TWRA 11.287, 11.288; 1991, UT 44.5484;
Turkey Creek	1941, UMMZ 169555;
Havley Spring Branch	1941, UMMZ 222475;
HR (RM 0.0 - 52.3)	
Flat Creek	1986, TWRA 11.135; 1990, UT 44.5081; 1991, UT 44.5271;
Little Flat Creek	1990, UT 44.5081;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1947, UMMZ 157609; 1962, UT 44.277; 1984, TWRA 11.73; 1987, VPI 06010102 020.01;
Horse Creek	1990, ANSP 168708;
Walker Fork	1992, UT 44.5593;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1940, CU 9953; 1958, UAIC 2570.02;
MFHR (Washington Co., VA)	1993, UT 44.5966;
Byer Creek	1990, UT 44.5706;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	1977, UT 44.1705;
Watauga (Carter Co., TN)	1988, UT 44.4787;
Elk River	1978, UT 44.1688; 1992, UAIC 10486.06;
Watauga (Sullivan Co., TN)	1984, TWRA 11.36; 1987, TWRA 11.291;

H43..

Pimephales promelas Rafinesque, 1820
fathead minnow

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
Beech Creek	1990, UT 44.4808;
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
Flat Creek	1990, UT 44.5082; 1991, UT 44.5082;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1965, ANSP 110719; 1974, ANSP 132159; 1987, VPI 06010102 031.01;
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Doe River	
Clarke Creek	1979, TWRA 11.22;
Watauga (Sullivan Co., TN)	

H44. *Pimephales vigilax* (Baird and Girard, 1853)
bullhead minnow

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1990, UT 44.4980;
Beech Creek	1990, UT 44.4980;
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1985, TWRA 11.75;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H45. *Rhinichthys atratulus* (Hermann, 1804)
blacknose dace

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110764; 1974, ANSP 132203;
Big Creek	1941, UMMZ 221694;
HR (RM 52.3-111)	1941, UMMZ 169549;
Black Oak Branch	1941, UMMZ 221313;
Caney Creek	1941, UMMZ 221723;
Cedar Creek	1941, UMMZ 221610;
Cloud Creek	1941, UMMZ 221746;
Crockett Creek	1941, UMMZ 221718;
Fall Creek	1941, UMMZ 222489;
German Creek	
Briar Fork	1941, UMMZ 221819;
Kellar Creek	1941, UMMZ 221625;
May Spring Branch	1941, UMMZ 221902;
Mossy Creek	1941, UMMZ 221322; 1952, CU 23282, 24625; 1953, CU 25539, 44528, 44874; 1970, UAIC 3902.01;
Narrow Valley Creek	1941, UMMZ 221884;
Needmore Creek	1941, UMMZ 222506;
Noe Creek	1941, UMMZ 222457;
Panther Creek	1941, UMMZ 221349, 222449;
Busby Creek	1941, UMMZ 222436;
Panther Springs	1941, UMMZ 222454; 1952, CU 44476; 1953, CU 23418;
Stubblefield Creek	1941, UMMZ 221586;
Turkey Creek	1941, UMMZ 169549;
Havley Spring Branch	1941, UMMZ 222479;
Turley Spring	1941, UMMZ 221898;
War Creek	1941, UMMZ 222540;
HR (RM 0.0 - 52.3)	
Buffalo Springs	1952, CU 23299, 23305; 23413; 1953, CU 25530, 1990, UT 44.5230;
Flat Creek	1990, UT 44.5083; 1991, UT 44.5272;
Unnamed Tributary	1991, UT 44.5267;
Lost Creek	1952, CU 23288; 1953, CU 23404, 25941;
Mill Spring	1941, UMMZ 221869; 1952, CU 44521; 1953, CU 25625;
Roseberry Creek	1990, UT 44.5121;
North Fork (NFHR)	
NFHR (Bland Co., VA)	1933, USNM 102430;
NFHR (Smyth Co., VA)	
Beaver Creek	1928, UMMZ 096865;
Laurel Creek	1951, CU 23786;
Locust Creek	1993, UT 44.5986;

H45. *Rhinichthys atratulus* (Hermann, 1804)
blacknose dace

NFHR (Washington Co., VA)	1937, UMMZ 130777;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1989, UT 44.4703;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1888, USNM 067958; 1954, UMMZ 169345, 169367; 1976, OSUM 43073, 43053; 1992, UAIC 10505.03;
Dickey Creek	1940, CU 9928;
SFHR (Washington Co., VA)	1987, VPI 06010102 031.01;
Laurel Creek	
Beaverdam Creek	1973, UT 44.732; 1981, UT 44.2414; 1986, TWRA 11.137;
SFHR (Sullivan Co., TN)	1974, ANSP 132177;
Beaver Creek	1928, UMMZ 096858,
Horse Creek	1992, UT 44.5607;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1938, UMMZ 129096; 1940, CU 9938, 9955; 1952, CU 21496; 1976, OSUM 43025; 1993, UT 44.5954;
Bear Creek	1976, OSUM 43062;
Hungry Mother Creek	1938, UMMZ 129115; 1993, UT 44.5954;
MFHR (Washington Co., VA)	
Byer Creek	1990, UT 44.5707;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183659;
Cove Creek	1964, UMMZ 183585;
Watauga (Johnson Co., TN)	
Doe Creek	1947, UMMZ 157466; 1977, UT 44.1687, 44.1706; 1978, UT 44.1707;
Watauga (Carter Co., TN)	1991, UT 44.5377;
Doe River	
Little Doe River	1985, UT 44.3184;
Elk River	
Little Stony Creek	1947, UMMZ 157527
Stony Creek	1991, UT 44.5357;
Watauga (Sullivan Co., TN)	

H47. *Rhinichthys cataractae* (Valenciennes, 1842)
longnose dace

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1987, VPI 06010102 031.01;
Laurel Creek	1947, CU 19177; 1961, CU 37706;
Beaverdam Creek	1973, UT 44.734; 1981, UT 44.2415; 1982, UT 44.2415; 1986, TWRA 11.114, 11.136;
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183660
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	1990, UT 44.4788;
Little Stony Creek	1969, UT 44.401;
Stony Creek	1978, UT 44.1710; 1991, UT 44.5485;
Watauga (Sullivan Co., TN)	

H48. *Semotilus atromaculatus* (Mitchill, 1818)
creek chub

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110765;
Big Creek	1990, UT 44.4972;
HR (RM 52.3-111)	
German Creek	
Briar Fork	1941, UMMZ 221821;
Turkey Creek	1941, UMMZ 169553;
Havley Springs Branch	1941, UMMZ 222478;
War Creek	1941, UMMZ 222527;
HR (RM 0.0 - 52.3)	
Flat Creek	1990, UT 44.5084;
Unnamed Tributary	1991, UT 44.5268;
North Fork (NFHR)	
NFHR (Bland Co., VA)	1933, USNM 102431;
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1976, OSUM 43074;
SFHR (Washington Co., VA)	1965, ANSP 110727;
Laurel Creek	
Beaverdam Creek	1981, UT 44.2417; 1986, TWRA 11.117;
Parks Creek	1973, UT 44.733;
SFHR (Sullivan Co., TN)	
Sinking Creek	1940, UMMZ 201912
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1961, CU 38084;
Bear Creek	1976, OSUM 43063;
Hungry Mother Creek	1971, UAIC 3997.04;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	1973, UT 44.737;
Roan Creek	1972, UT 44.728; 1977, UT 44.1713;
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H49.

Carpiodes carpio (Rafinesque, 1820)
river carpsucker

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	1986, TWRA 7.22;
Spring Creek	1941, UMMZ 221599;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1970, UT 45.113; 1989, UT 45.832; 1990, ANSP 168682;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H50.

Carpiodes cyprinus (Lesueur, 1817)
quillback

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	1972, UT 45.136;
Dodsons Creek	1941, UMMZ 221668;
Poor Valley Creek	1941, UMMZ 221803;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H51. *Catostomus commersoni* (Lacepede, 1803)
white sucker

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110766;
HR (RM 52.3-111)	1941, UMMZ 169543;
Black Oak Branch	1941, UMMZ 221316;
Caney Creek	1941, UMMZ 221727;
Cloud Creek	1941, UMMZ 221763;
Dodsons Creek	1941, UMMZ 221658;
Fall Creek	1941, UMMZ 222480;
German Creek	
Briar Fork	1941, UMMZ 221813;
Ray Creek	1941, UMMZ 221838;
Honeycutt Creek	1941, UMMZ 221643;
May Spring Branch	1941, UMMZ 221903;
Mossy Creek	1941, UMMZ 221323; 1952, CU 23285, 24624; 1953, CU 25712, 44875; 1970, UAIC 3902.02; 1991, UT 45.923; 1992, UT 45.923;
Needmore Creek	1941, UMMZ 222505;
Panther Creek	1941, UMMZ 221340;
Busby Creek	1941, UMMZ 222434;
Panther Springs Creek	1952, CU 24447;
Red House Branch	1941, UMMZ 221764;
Spring Creek	1941, UMMZ 221602;
Stubblefield Creek	1941, UMMZ 221583;
Turkey Creek	1941, UMMZ 169543;
Havley Spring Branch	1941, UMMZ 222476;
Turley Spring	1941, UMMZ 221892;
War Creek	1941, UMMZ 222541;
HR (RM 0.0 - 52.3)	
Buffalo Springs	1952, CU 23296; 1990, UT 45.923;
Lost Creek	1952, CU 23287; 1953, CU 25943;
Mill Spring Branch	1941, UMMZ 221870;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1976, OSUM 43075;
SFHR (Washington Co., VA)	1974, ANSP 132160; 1980, ANSP 146029;

H51. *Catostomus commersoni* (Lacepede, 1803)
white sucker

Laurel Creek	
Beaverdam Creek	1940, UMMZ 201883; 1981, UT 45.388;
SFHR (Sullivan Co., TN)	1974, ANSP 132169, 132178; 1980, ANSP 146016, 146061, 146076; 1989, UT 45.833;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1940, CU 9941, 9959; 1952, CU 21495; 1956, UMMZ 171345 1993, UT 45.1112; 1993, UT 45.1112;
Hungry Mother Creek	1938, UMMZ 129117
MFHR (Washington Co., VA)	1993, UT 45.1112;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	1947, UMMZ 157465;
Watauga (Carter Co., TN)	1990, UT 45.855;
Watauga (Sullivan Co., TN)	

H52. *Hypentelium nigricans* (Lesueur, 1817)
northern hog sucker

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1974, ANSP 132204;
Beech Creek	1941, UMMZ 221673; 1990, UT 45.858;
HR (RM 52.3-111)	
Black Oak Branch	1941, UMMZ 221315;
Caney Creek	1941, UMMZ 221728;
Cedar Creek	1941, UMMZ 221612;
Cloud Creek	1941, UMMZ 221756;
Fall Creek	1941, UMMZ 221483;
German Creek	
Briar Fork	1941, UMMZ 221828;
Ray Creek	1941, UMMZ 221846;
May Spring Branch	1941, UMMZ 221905;
Noe Creek	1941, UMMZ 222469;
Panther Creek	1941, UMMZ 221348, 222441;
Poor Valley Creek	1941, UMMZ 221783;
Spring Creek	1941, UMMZ 221595;
Stubblefield Creek	1941, UMMZ 221585;
Turkey Creek	1941, UMMZ 169544;
Turley Spring	1941, UMMZ 221889;
HR (RM 0.0 - 52.3)	1987, TWRA 7.41; 1991, UT 45.966;
Buffalo Springs	1952, CU 23297, 23304;
Flat Creek	1991, UT 45.956;
Mill Spring Creek	1941, UMMZ 221867;
Roseberry Creek	1990, UT 45.905;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096898; 1940, CU 9968; 1951, CU 20687; 1967, CU 63552; 1979, OSUM 38842;
Beaver Creek	1928, UMMZ 096871;
Laurel Creek	1951, CU 20933; 1956, UMMZ 171317;
NFHR (Washington Co., VA)	1937, UMMZ 130768; 1978, OSUM 42098; 1990, INHS 58996;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46407; 1989, UT 45.826; 1991, UT 45.826;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1992, UAIC 10505.04;
SFHR (Washington Co., VA)	1947, UMMZ 157485; 1961, CU 37707; 1965, ANSP 110729; 1974, ANSP 132161; 1980, ANSP 146030;
Laurel Creek	1952, CU 21517, 21555;

H52. *Hypentelium nigricans* (Lesueur, 1817)
northern hog sucker

Beaverdam Creek	1936, UMMZ 113301; 1938, UMMZ 119718; 1982, UT 45.424;
Straight Creek	1967, CU 63439;
SFHR (Sullivan Co., TN)	1947, UMMZ 157529, 157559, 157592; 1949, UMMZ 159007; 1965, ANSP 110740, 110748; 1974, ANSP 132179, 132190; 1980, ANSP 146014, 146059, 146075; 1990, ANSP 168683, 168713;
Beaver Creek	1928, UMMZ 096860; 1953, CU 25619, 25732;
Horse Creek	1992, UT 45.1014;
Walker Fork	1992, UT 45.1014;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1938, UMMZ 129090; 1940, CU 9940; 1952, CU 21497, 21535, 21559; 1956, UMMZ 171344; 1970, UAIC 3799.04;
Bear Creek	1938, UMMZ 129099
Hungry Mother Creek	1938, UMMZ 129108; 1971, UAIC 3997.05;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183657, 183662, 1968, CU 53823,
Cove Creek	1964, UMMZ 183583, 183589;
Watauga (Johnson Co., TN)	1947, UMMZ 157472
Blue Springs	1947, UMMZ 157380
Doe Creek	1947, UMMZ 157464; 1977, UT 45.289;
Roan Creek	1947, UMMZ 157429;
Watauga (Carter Co., TN)	1937, UMMZ 130820; 1947, UMMZ 157387; 1988, UT 45.854;
Doe River	1953, CU 24505;
Elk River	1947, UMMZ 157408; 1977, UT 45.454; 1992, UAIC 10486.07;
Watauga (Sullivan Co, TN)	

H53.

Ictiobus bubalus (Rafinesque, 1818)
smallmouth buffalo

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1985, TWRA 7.11;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H54.

Ictiobus niger (Rafinesque, 1819)
black buffalo

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	1992, UT 45.997;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H55. *Moxostoma anisurum* (Rafinesque, 1820)
silver redhorse

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
German Creek	
Ray Creek	1941, UMMZ 221831;
HR (RM 0.0 - 52.3)	1991, UT 45.981;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1947, UMMZ 157556;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H56. *Moxostoma carinatum* (Cope, 1870)
river redhorse

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	1941, UMMZ 200893;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1947, UMMZ 157532, 157558, 157591;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H57.

Moxostoma duquesnei (Lesueur, 1817)
black redbhorse

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110767; 1974, ANSP 132205;
Big Creek	1941, UMMZ 221709;
HR (RM 52.3-111)	1968, UT 45.58; 1972, UT 45.135;
Black Oak Branch	1941, UMMZ 221308;
Caney Creek	1941, UMMZ 221736;
German Creek	
Ray Creek	1941, UMMZ 221842;
Mossy Creek	1941, UMMZ 221320;
Noe Creek	1941, UMMZ 222468;
Panther Creek	1941, UMMZ 221356, 222444;
Poor Valley Creek	1941, UMMZ 221790;
Red House Branch	1941, UMMZ 221771;
Spring Creek	1941, UMMZ 221597;
Turkey Creek	1941, UMMZ 169542;
Turley Spring	1941, UMMZ 221890;
HR (RM 0.0 - 52.3)	
Mill Spring Branch	1941, UMMZ 221863;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096896; 1954, CU 48006; 1955, CU 53296; 1956, CU 32059, 48009; 1963, CU 48011; 1967, CU 63553;
Laurel Creek	1956, UMMZ 171318;
NFHR (Washington Co., VA)	1988, VPI 06010101 003.08;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1989, UT 45.828; 1991, UT 45.965;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1947, UMMZ 157487; 1964, TU 34589;
Fifteen Mile Creek	1937, USNM 104136;
SFHR (Sullivan Co., TN)	1930, ANSP 54742; 1947, UMMZ 157520, 157530, 157555, 157590; 1974, ANSP 132167; 1980, ANSP 146013; 1989, UT 45.835;
Reedy Creek	1977, UT 45.264;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1951, CU 21018; 1958, CU 48008;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1963, NCSM 1484-6, 1504-13;

H57. *Moxostoma duquesnei* (Lesueur, 1817)
black redhorse

Locality	Chronological Catalogue Numbers
Watauga (Carter Co., TN)	1888, USNM 40431; 1937, UMMZ 130821; 1947, UMMZ 157388; 1988, UT 45.853;
Doe River	1953, CU 24509; 1988, UT 45.856;
Watauga (Johnson Co., TN)	1947, UMMZ 157473; USNM 162226;
Watauga (Sullivan Co., TN)	
Elk River	1977, UT 45.456;
Roan Creek	1947, UMMZ 157431; 1977, UT 45.291;

H58. *Moxostoma erythrurum* (Rafinesque, 1818)
golden redhorse

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1968, UT 45.57, 45.59;
Beech Creek	1941, UMMZ 221682;
Big Creek	1941, UMMZ 221706;
HR (RM 52.3-111)	1941, UMMZ 222510;
Black Oak Branch	1941, UMMZ 221309;
Caney Creek	1941, UMMZ 221721;
Cloud Creek	1941, UMMZ 221749;
Dodsons Creek	1941, UMMZ 221670;
Fall Creek	1941, UMMZ 222481, 222492;
German Creek	
Briar Fork	1941, UMMZ 221823;
Ray Creek	1941, UMMZ 221854;
Honeycutt Creek	1941, UMMZ 221648;
Keller Creek	1941, UMMZ 221632;
Mossy Creek	1952, CU 24135;
Panther Creek	1941, UMMZ 221357, 222443;
Poor Valley Creek	1941, UMMZ 221808;
Red House Branch	1941, UMMZ 221770;;
Spring Creek	1941, UMMZ 221603;
Turkey Creek	1941, UMMZ 222864;
War Creek	1941, UMMZ 222536;
HR (RM 0.0 - 52.3)	
Flat Creek	1990, UT 45.898;
Mill Spring Branch	1941, UMMZ 221866;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096897; 1940, CU 9966; 1954, CU 47998; 1955, CU 47995; 1956, CU 32040; 1961, CU 38065;
New Cove Creek	1961, CU 48002;
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1989, UT 45.827;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1947, UMMZ 157486;
SFHR (Sullivan Co., TN)	1947, UMMZ 157519, 157531, 157589 187237; 1989, UT 45.834;
Horse Creek	1990, ANSP 168696;
Middle Fork (MFHR)	

H58. *Moxostoma erythrurum* (Rafinesque, 1818)
golden redhorse

Locality	Chronological Catalogue Numbers
MFHR (Smyth Co., VA)	1954, CU 47996, 48000;
MFHR (Washington Co., VA)	1888, UMMZ (IU 8056); USNM 40467;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	1947, UMMZ 157430;
Watauga (Carter Co., TN)	1947, UMMZ 157400;
Elk River	1977, UT 45.455;
Watauga (Sullivan Co., TN)	

H59. *Moxostoma lacera* Jordan and Brayton, 1877
harelip sucker

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1888, UMMZ 144489;
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H60. *Moxostoma macrolepidotum* (Lesueur, 1817)
shorthead redhorse

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1991, UT 45.971;
HR (RM 52.3-111)	1941, UMMZ 222511; 1949, UT 45.94; 1968, UT 45.299;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	1987, UAIC 7922.14;
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1947, UMMZ 157557;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	1978, UT 45.437;
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H61.

Ameiurus natalis (Lesueur, 1819)
yellow bullhead

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110768; 1980, ANSP 146096; 1987, TWRA 15.20; 1992, UAIC 10526.09;
HR (RM 52.3-111)	
Black Oak Branch	1941, UMMZ 221312;
Cedar Creek	1941, UMMZ 221615;
Cloud Creek	1941, UMMZ 221762;
Kellar Creek	1941, UMMZ 221633;
Noe Creek	1941, UMMZ 222472;
Panther Creek	1941, UMMZ 221358;
Poor Valley Creek	1941, UMMZ 221798; 1991, UT 48.741;
Red House Branch	1941, UMMZ 221774;
Robertson Creek	1941, UMMZ 221645;
Spring Creek	1941, UMMZ 221605;
Turkey Creek	1941, UMMZ 169557;
War Creek	1941, UMMZ 222528;
HR (RM 0.0 - 52.3)	
Mill Spring Branch	1941, UMMZ 221868;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	1954, ASNP 74226; 1988, VPI 06010101 003.08; 1990, INHS
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1965, ANSP 110749; 1974, ANSP 132180, 132191; 1980, ANSP 146039, 146060; 1986, TWRA 15.12;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1993, UT 48.794;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H62. *Ictalurus punctatus* (Rafinesque, 1818)
channel catfish

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1990, UT 48.686;
HR (RM 52.3-111)	1941, UMMZ 222517; 1949, CU 44024; 1986, TWRA 15.9, 15.10;
Caney Creek	1941, UMMZ 221732;
Cedar Creek	1941, UMMZ 221616;
Cloud Creek	1941, UMMZ 221754;
Honeycutt Creek	1941, UMMZ 221644;
Noe Creek	1941, UMMZ 222467;
Panther Creek	1941, UMMZ 221359;
Poor Valley Creek	1941, UMMZ 221807;
Sping Creek	1941, UMMZ 221588;
Turkey Creek	1941, UMMZ 169556;
HR (RM 0.0 - 52.3)	1977, UMMZ 201148;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	1988, VPI 06010101 003.08;
NFHR (Scott Co., VA)	1954, ANSP 110730;
NFHR (Hawkins/Sullivan Co., TN)	1989, UT 48.676;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1965, ANSP 110730;
SFHR (Sullivan Co., TN)	1984, TWRA 15.3; 1985, TWRA 15.8;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H63.

Noturus eleutherus Jordan, 1877
mountain madtom

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	1976, UT 44.493;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1984, TWRA 15.4; 1989, UT 48.677; 1990, INHS 59010;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1930, ANSP 54723; 1947, UMMZ 157575, 159008;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H64. *Noturus flavipinnis* Taylor, 1969
yellowfin madtom

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1888, USNM 040455 (Paratype)
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H65.

Noturus flavus Rafinesque, 1818
stonecat

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Big Moccasin Creek	1973, OSUM 77157;
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1959, USNM 190943;
SFHR (Sullivan Co., TN)	1947, UMMZ 157576; 1949, UMMZ 159009;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	1947, UMMZ 157444;
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H66. *Noturus insignis* (Richardson, 1836)
marginated madtom

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1951, CU 20685; 1953, CU 72108; 1967, CU 63555; 1975, UT 48.210; 1993, UT 48.798;
Lick Creek	1993, UT 48.798;
NFHR (Washington Co., VA)	1988, VPI 06010101 003.08; 1992, UAIC 10522.10; 1993, UT 48.798;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183673, 183680; 1968, CU 53827; 1973, UT 48.130; 1985, UAIC 9506.06; 1991, UT 48.740;
Watauga (Johnson Co., TN)	1973, UT 48.270; 1977, UT 48.338;
Roan Creek	1990, UT 48.680;
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H67.

Pylodictis olivaris (Rafinesque, 1818)
flathead catfish

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	1986, TWRA 15.11;
Panther Creek	1941, UMMZ 221341;
Spring Creek	1941, UMMZ 221601;
Turkey Creek	1941, UMMZ 222862;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1991, UT 48.725;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1974, ANSP 132192; 1986, TWRA 15.13;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H68.

Esox lucius Linnaeus, 1758
northern pike

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1987, VPI 06010102 031.01
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H69. *Oncorhynchus mykiss* (Walbaum, 1792)
rainbow trout

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
Bufflao Springs	1990, UT 31.132;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1992, UAIC 10505.05;
Laurel Creek	
Beaverdam Creek	1940, UMMZ 201893;
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1992, UAIC 10505.05;
SFHR (Washington Co., VA)	1987, VPI 06010102 031.01;
Laurel Creek	
Beaverdam Creek	1940, UMMZ 201893;
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	1965, ANSP 110737;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	
Roan Creek	
Watauga (Carter Co., TN)	
Doe River	1984, UT 31.44;
Laurel Spring Creek	
Elk River	
Little Stony Creek	1947, UMMZ 157528
Stony Creek	
Watauga (Sullivan Co., TN)	

H70.

Salmo trutta Linnaeus, 1758
brown trout

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
Laurel Creek	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1987, VPI 06010102 031.01;
Laurel Creek	
Beaverdam Creek	
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
Bear Creek	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Doe River	1979, TWRA 22.2, 22.3; 1984, UT 31.43;
Laurel Spring Creek	
Watauga (Sullivan Co., TN)	

H71.

Fundulus catenatus (Storer, 1846)
northern studfish

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096899;
NFHR (Washington Co., VA)	1937, UMMZ 130779, 130788; 1988, UAIC 8423.17; VPI 06010101 003.08;
NFHR (Scott Co., VA)	1954, ANSP 74235; 1967, CU 62939; 1987; UAIC 7922.15;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46394; 1971, INHS 82726;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H72. *Fundulus notatus* (Rafinesque, 1820)
blackstripe topminnow

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	1982, UT 60.281;
Swanpond Creek	1994, UT 60.281;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H73. *Gambusia affinis* (Baird and Girard, 1853)
mosquitofish

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110769; 1974, ANSP 132207; 1980, ANSP 146089;
Beech Creek	1990, UT 61.89;
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
Buffalo Springs	1952, CU 23415; 1953, CU 25529; 1990, UT 61.97;
Swanpond Creek	1991, UT 61.102;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1965, ANSP 110756; 1974, ANSP 132170; 1985, TWRA 20.1; 1990, ANSP 168686;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H74.

Labidesthes sicculus (Cope, 1865)
brook silverside

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
Beech Creek	1990, UT 158.104;
HR (RM 52.3-111)	1983, TWRA 6.1;
Mossy Creek	1952, CU 23292;
Poor Valley Creek	1987, TWRA 6.5;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H75.

Cottus baileyi Robins, 1961
black sculpin

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	1867, ANSP 11864-11865; 1933, USNM 102433;
NFHR (Smyth Co., VA)	1987, VPI 06010102 013.00;
Laurel Creek	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1976, OSUM 43055, 43077; 1979, OSUM 38878;
Comers Creek	1976, OSUM 43050;
SFHR (Washington Co., VA)	1987, VPI 06010102 031.01;
Laurel Creek	1947, CU 19179; 1961, CU 37711;
Beaverdam Creek	
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1940, CU 22849 (Paratopotypes), 25914 (Holotype), 25915 (Allotype); UMMZ 167171 (Paratopotypes); 1952, CU 24418; 1962, CU 42710; 1976, OSUM 43026;
Bear Creek	1938, UMMZ 129106; 1976, OSUM 43067;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	
Roan Creek	
Watauga (Carter Co., TN)	
Doe River	
Laurel Spring Creek	
Elk River	
Stony Creek	
Watauga (Sullivan Co., TN)	

H76.

Cottus bairdi Girard, 1850
mottled sculpin

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1951, CU 25954 (Holotype), 25955 (Paratopotypes); UMMZ 167173 (Paratopotypes); 1954, UMMZ 169350, 169371; 1976 OSUM 43057;
SFHR (Washington Co., VA)	1947, UMMZ 167364;
SFHR (Sullivan Co., TN)	1947, UMMZ 157619
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1952, CU 21536; 1958, UAIC 2570.01;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	1947, UMMZ 157471; 1953, CU 25953;
Watauga (Carter Co., TN)	
Elk River	1947, UMMZ 157428;
Watauga (Sullivan Co., TN)	

H77.

Cottus carolinae (Gill, 1861)
banded sculpin

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1974, ANSP 132214; 1980, ANSP 146082; 1992, UAIC 10526.10;
Big Creek	1941, UMMZ 221701;
HR (RM 52.3-111)	1941, UMMZ 169565
Black Oak Branch	1941, UMMZ 221307;
Caney Creek	1941, UMMZ 221724;
Cedar Creek	1941, UMMZ 221617;
Dodsons Creek	1941, UMMZ 221652;
Fall Creek	1941, UMMZ 222493;
German Creek	
Briar Fork	1941, UMMZ 221812;
Ray Creek	1941, UMMZ 221853;
May Spring Branch	1941, UMMZ 221901;
Mossy Creek	1953, CU 24443; 1970, UAIC 3902.05;
Narrow Valley Creek	1941, UMMZ 221877;
Needmore Creek	1941, UMMZ 222496;
Noe Creeek	1941, UMMZ 222465;
Panther Creek	1941, UMMZ 221342, 222451;
Busby Creek	1941, UMMZ 222435;
Panther Springs	1941, UMMZ 222453; 1952, CU 24445; 1953, CU 23417;
Poor Valley Creek	1941, UMMZ 221788;
Spring Creek	1941, UMMZ 221596;
Stubblefield Creek	1941, UMMZ 221581;
Turkey Creek	1941, UMMZ 169565;
Turley Spring	1941, UMMZ 221891;
War Creek	1941, UMMZ 222537;
HR (RM 0.0 - 52.3)	1953, CU 25536; 1987, TWRA 10.24; 1991, UT 129.361;
Beaver Creek	1953, CU 25728;
Buffalo Springs	1952, CU 23300, 23303, 23414; 1953, CU 25531;
Indian Cave	
Mill Spring	1941, UMMZ 221872; 1952, 23302; 1953, CU 25622;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096873; 1940, CU 9963; 1958, UR 872, 953; 1967, CU 63554; 1979, OSUM 38846; 1987, VPI 06010101 013.00;
Beaver Creek	1928, UMMZ 096862
Laurel Creek	
NFHR (Washington Co., VA)	1978, OSUM 42448; 1988, VPI 06010101 003.08; 1992, UAIC 10522.11;

H77.

Cottus carolinae (Gill, 1861)
banded sculpin

Locality	Chronological Catalogue Numbers
NFHR (Scott Co., VA)	
Big Moccasin Creek	
Possum Creek	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1888, USNM 067974; 1951, CU 20952; 1954, UMMZ 169370; 1976, OSUM 43056; 1992, UAIC 10505.06;
SFHR (Washington Co., VA)	1947, UMMZ 157505; 1965, ANSP 110736; 1974, ANSP 132164; 1980, ANSP 146036; 1987, VPI 06010102 031.01; 1992, UAIC 10600.01;
Laurel Creek	
Beaverdam Creek	1940, UMMZ 201945
Whitetop Laurel Creek	
Straight Creek	1967, CU 63440;
SFHR (Sullivan Co., TN)	1965, ANSP 110743, 110754; 1974, ANSP 132168; 1980, ANSP 146051 146054; 1990, ANSP 168675, 168685, 168718;
Beaver Creek	1928, UMMZ 096861
Bristol Caverns	1947, CU 11600;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1940, CU 9942 9962; 1952, CU 21491; 1956, UMMZ 171355; 1958, UAIC 2570.04; 1961, CU 37894, 38094; 1962, 41847; 1970, UAIC 3799.01;
Bear Creek	1938, UMMZ 129107; 1976, OSUM 43068;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	1947, UMMZ 157484;
Doe Creek	
Roan Creek	1947, UMMZ 157454
Watauga (Carter Co., TN)	1947, UMMZ 157407
Doe River	
Laurel Spring Creek	
Elk River	
Stony Creek	1940, UMMZ 201944
Watauga (Sullivan Co., TN)	

H78.

Morone chrysops (Rafinesque, 1820)
white bass

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	1954, CU 28522; 1986, TWRA 17.9;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1985, TWRA 17.9;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H79. *Morone mississippiensis* Jordan and Eigenmann, 1887
yellow bass

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	1987, TWRA 17.18; 1992, UT 85.71;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H80. *Morone saxatilis* (Walbaum, 1792)
striped bass

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1990, UT 85.64;
HR (RM 52.3-111)	1986, TWRA 17.15;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H81. *Ambloplites rupestris* (Rafinesque, 1817)
rock bass

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110770; 1974, ANSP 132208; 1992, UAIC 10526.11;
Big Creek	1941, UMMZ 221697;
HR (RM 52.3-111)	1941, UMMZ 222522;
Black Oak Branch	1941, UMMZ 221318;
Caney Creek	1941, UMMZ 221725;
Dodsons Creek	1941, UMMZ 221662;
German Creek	
Briar Fork	1941, UMMZ 221825;
Ray Creek	1941, UMMZ 221832;
Needmore Creek	1941, UMMZ 222497;
Noe Creek	1941, UMMZ 222471;
Panther Creek	1941, UMMZ 221355, 222440;
Poor Valley Creek	1941, UMMZ 221777;
Turley Creek	1941, UMMZ 221893;
Turkey Creek	1941, UMMZ 169561;
War Creek	1941, UMMZ 222542;
HR (RM 0.0 - 52.3)	1991, UT 90.1319;
Beaver Creek	1953, CU 25617;
Flat Creek	1976, INHS 75139;
Mill Spring Branch	1941, UMMZ 221874;
Roseberry Creek	1990, UT 90.1255;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096900, 1954, CU 34259; 1961, CU 38069; 1967, CU 63556; 1987, VPI 06010101 013.00; 1993, UT 90.1543;
Beaver Creek	1928, UMMZ 096872;
Laurel Creek	1956, UMMZ 171328;
NFHR (Washington Co., VA)	1937, UMMZ 130783, 130790; 1953, CU 34265; 1954, CU 34258, 34267, 34273; 1978, OSUM 42442; 1979, OSUM 38775; 1988, VPI 06010101 003.08; 1990, INHS 58997;
NFHR (Scott Co., VA)	1967, CU 62940; 1987, UAIC 7922.16;
Big Moccasin Creek	1938, UMMZ 129068; 1954, CU 34254;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46405; 1974, ANSP 132193; 1989, UT 90.1158; 1990, INHS 59011;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1888, USNM 067955; 1992, UAIC 10505.07;

H81. *Ambloplites rupestris* (Rafinesque, 1817)
rock bass

Locality	Chronological Catalogue Numbers
SFHR (Washington Co., VA)	1947, UMMZ 157504; 1965, ANSP 110731; 1974, ANSP 132162; 1980, ANSP 146032; 1987, VPI 06010102 020.01, 06010102 031.01;
Laurel Creek	1940, UMMZ 201889;
Beaverdam Creek	1936, UMMZ 113296;
SFHR (Sullivan Co., TN)	1947, UMMZ 157518, 157552, 157587, 157618; 1980, ANSP 146049, 146074;
Horse Creek	1992, UT 90.1377;
Walker Fork	1992, UT 90.1377;
Sinking Creek	1940, UMMZ 201913;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1940, CU 9960; 1952, CU 21543, 21564; 1954, CU 34253; 1956, UMMZ 171354; 1961, CU 38095; 1970, UAIC 3799.05; 1993, UT 90.1542;
Bear Creek	1976, OSU 43064;
MFHR (Washington Co., VA)	1888, USNM 040542;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183676; 1985, UAIC 9506.07;
Watauga (Johnson Co., TN)	
Blue Springs	1947, UMMZ 157386;
Roan Creek	1947, UMMZ 157453
Watauga (Carter Co., TN)	1947, UMMZ 157405;
Doe River	1984, UT 90.752; 1988, UT 90.1181;
Elk River	1947, UMMZ 157427; 1978, UT 90.665;
Watauga (Sullivan Co., TN)	

H82. *Lepomis auritus* (Linnaeus, 1758)
 redbreast sunfish

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110771; 1974, ANSP 132209;
Beech Creek	1990, UT 90.1183;
HR (RM 52.3-111)	
Black Oak Creek	1941, UMMZ 221300;
German Creek	
Ray Creek	1941, UMMZ 221849;
Noe Creek	1941, UMMZ 222466;
Poor Valley Creek	1991, UT 90.1344;
Turkey Creek	1941, UMMZ 169564;
HR (RM 0.0 - 52.3)	
Flat Creek	
Unnamed Tributary	1991, UT 90.1256;
Roseberry Creek	1990, UT 90.1256;
Swanpond Creek	1992, UT 90.1256;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	1988, VPI 06010101 003.08;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1971, INHS 82727; 1989, UT 90.1159;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1965, ANSP 110750, 110757; 1974, ANSP 132181; 1980, ANSP 146073; 1990, ANSP 168699, 168714;
Horse Creek	1992, UT 90.1378;
Walker Fork	1992, UT 90.1378;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1952, CU 21492;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1991, UT 90.1343;
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H83. *Lepomis cyanellus* Rafinesque, 1819
green sunfish

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
Poor Valley Creek	1991, UT 90.1342;
HR (RM 0.0 - 52.3)	
Richland Creek	1991, UT 90.1338;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1984, TWRA 8.16;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H84. *Lepomis gibbosus* (Linnaeus, 1758)
pumpkinseed

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1987, VPI 06010102 020.01; 06010102 031.01;
SFHR (Sullivan Co., TN)	1962, UMMZ 179968; UT 90.36; 1985, TWRA 8.32; 1986, TWRA 8.45; 1991, UT 90.1341;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1986, UT 90.1357;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H85. *Lepomis gulosus* (Cuvier, 1829)
warmouth

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1987, VPI 06010102 020.01;
SFHR (Sullivan Co., TN)	1947, UMMZ 157554; 1984, TWRA 8.18;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H86. *Lepomis macrochirus* Rafinesque, 1819
bluegill

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110772; 1974, ANSP 132210;
Beech Creek	1941, UMMZ 221677;
Big Creek	1941, UMMZ 221690;
HR (RM 52.3-111)	1941, UMMZ 169563;
Black Oak Creek	1941, UMMZ 221299;
Crockett Creek	1941, UMMZ 221714;
Dodsons Creek	1941, UMMZ 221651;
Honeycutt Creek	1941, UMMZ 221640;
Mossy Creek	1952, CU 23292;
Panther Creek	1941, UMMZ 221350;
Panther Springs	1953, CU 23419;
Poor Valley Creek	1941, UMMZ 221778;
Red House Branch	1941, UMMZ 221769;
Turkey Creek	1941, UMMZ 169563;
HR (RM 0.0 - 52.3)	1953, CU 25535;
Buffalo Springs	1952, CU 23416;
Mill Springs	1941, UMMZ 221865; 1952, CU 44522;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1987, VPI 06010101 013.00;
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1989, UT 90.1160;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1965, ANSP 110732; 1980, ANSP 146031; 1987, VPI 06010102 020.01, 06010102 031.01;
SFHR (Sullivan Co., TN)	1947, UMMZ 157553; 1965, ANSP 110751; 1980, ANSP 146011, 146041, 146072; 1985, TWRA 8.33;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1961, CU 38081;
MFHR (Washington Co., VA)	1888, USNM 040504;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Elk River	1977, UT 90.667;
Watauga (Sullivan Co., TN)	

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1974, ANSP 132211; 1980, ANSP 146088;
Big Creek	1941, UMMZ 221687;
HR (RM 52.3-111)	1941, UMMZ 222525;
Black Oak Branch	1941, UMMZ 221301;
Caney Creek	1941, UMMZ 221731;
Cedar Creek	1941, UMMZ 221618;
Cloud Creek	1941, UMMZ 221751;
Dodsons Creek	1941, UMMZ 221666;
German Creek	
Ray Creek	1941, UMMZ 221839;
Honeycutt Creek	1941, UMMZ 221641;
Narrow Valley Creek	1941, UMMZ 221881;
Panther Creek	1941, UMMZ 221351;
Poor Valley Creek	1941, UMMZ 221792;
Red House Branch	1941, UMMZ 221772;
Spring Creek	1941, UMMZ 221594;
War Creek	1941, UMMZ 222539;
HR (RM 0.0 - 52.3)	1953, CU 25532;
Flat Creek	1992, UT 90.1395;
Mill Spring Branch	1941, UMMZ 221862;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1888, USNM 040396; 1928, UMMZ 096875; 1954, ANSP 74191;
NFHR (Washington Co., VA)	1937, UMMZ 130781, 130791; 1954, ANSP 74232; 1978, OSUM 42099, 42443; 1988, VPI 06010101 003.08;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1989, UT 90.1161;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1980, ANSP 146042, 146052, 146053, 146079; 1985, TWRA 8.19, 8.28; 1986, TWRA 8.46; 1987, TWRA 8.58;
Horse Creek	1990, ANSP 168704;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	

H87.

Lepomis megalotis (Rafinesque, 1820)
longear sunfish

438

Locality	Chronological Catalogue Numbers
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H88. *Lepomis microlophus* (Günther)
redeer sunfish

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	1982, UT 90.660;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1984, TWRA 8.17; 1990, ANSP 168697;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1974, ANSP 132212;
Big Creek	1941, UMMZ 221700;
HR (RM 52.3-111)	
Black Oak Branch	1941, UMMZ 221305;
Dodsons Creek	1941, UMMZ 221653;
German Creek	
Briar Fork	1941, UMMZ 221820;
Ray Creek	1941, UMMZ 221855;
Noe Creek	1941, UMMZ 222464;
Panther Creek	1941, UMMZ 221346;
Poor Valley Creek	1941, UMMZ 221795;
Robertson Creek	1941, UMMZ 221636;
Spring Creek	1941, UMMZ 221604;
Turkey Creek	1941, UMMZ 169562;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096874; 1961, CU 38067; 1967, CU 63557; 1987, VPI 06010101 013.00;
Laurel Creek	1928, UMMZ 171329;
NFHR (Washington Co., VA)	1937, UMMZ 130782, 130789; 1954, ANSP 74222; 1978, OSUM 42100, 42444; 1988, VPI 06010101 003.08; 1992, UAIC 10522.TA;
NFHR (Scott Co., VA)	1967, CU 62942;
Big Moccasin Creek	1938, UMMZ 129067;
NFHR (Hawkins/Sullivan Co., TN)	1989, UT 90.1162; 1991, UT 90.1313;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1947, UMMZ 157503; 1987, 06010102 020.01, 06010102 031.01;
SFHR (Sullivan Co., TN)	1947, UMMZ 157509, 157551, 157588, 157617; 1949, UMMZ 159018; 1974, ANSP 132194; 1980, ANSP 146058, 146012 146087 1990, ANSP 168688;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	1888, USNM 040433;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183675; 1985, UAIC 9506.08;
Watauga (Johnson Co., TN)	1947, UMMZ 157483;
.. Blue Springs	1947, UMMZ 157385
Roan Creek	1947, UMMZ 157452;

H89. *Micropterus dolomieu* Lacepede, 1802
smallmouth bass

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Locality	Chronological Catalogue Numbers
Watauga (Carter Co., TN)	1947, UMMZ 157406;
Elk River	1947, UMMZ 157426; 1977, UT 90.666;
Watauga (Sullivan Co., TN)	

H90. *Micropterus punctulatus* (Rafinesque, 1819)
spotted bass

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
Beech Creek	1941, UMMZ 221672;
Big Creek	1941, UMMZ 221692;
HR (RM 52.3-111)	1941, UMMZ 222519; 1948, CU 11691;
Caney Creek	1941, UMMZ 221722;
Dodsons Creek	1941, UMMZ 221659;
German Creek	
Ray Creek	1941, UMMZ 221843;
Poor Valley Creek	1941, UMMZ 221779;
Robertson Creek	1941, UMMZ 221637;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1965, ANSP 110752; 1990, ANSP 168707, 168715;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H91. *Micropterus salmoides* (Lacepede, 1802)
largemouth bass

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1974, ANSP 132213; 1980, ANSP 146086;
HR (RM 52.3-111)	1941, UMMZ 169560;
Black Oak Branch	1941, UMMZ 221304;
Mossy Creek	1952, CU 23295;
Panther Creek	1941, UMMZ 221345;
Poor Valley Creek	1941, UMMZ 221805;
Heck Branch	1991, UT 90.1345;
Little Poor Valley Cr	1991, UT 90.1345;
Turkey Creek	1941, UMMZ 169560;
HR (RM 0.0 - 52.3)	
Mill Springs	1952, CU 44523; 1953, CU 25624;
Roseberry Creek	1990, UT 90.1257;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1987, VPI 06010102 020.01;
SFHR (Sullivan Co., TN)	1990, ANSP 168674;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H92. *Pomoxis annularis* Rafinesque, 1818
white crappie

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1965, ANSP 110773;
HR (RM 52.3-111)	1986, TWRA 8.41;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	1954, ANSP 74253;
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H93. *Pomoxis nigromaculatus* (Lesueur, 1829)
black crappie

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
Beech Creek	1990, UT 90.1217;
HR (RM 52.3-111)	1986, TWRA 8.42;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1987, VPI 06010102 020.01;
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H94.

Etheostoma acuticeps Bailey, 1959
sharphead darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1972, RC REJ 608; USNM 211794;
SFHR (Sullivan Co., TN)	1930, ANSP 117307, 65173-65187, 65198-65202, 1949, UMMZ 157585 (Paratopotypes), 159013 (Paratopotypes), 159014 (Holotype);
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H95. *Etheostoma blennioides* Rafinesque, 1819
greenside darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1980, ANSP 146084; 1987, TWRA 18.146; 1991, UT 91.4051; 1992, UAIC 10526.12;
Beech Creek	1990, UT 91.3708;
Big Creek	1941, UMMZ 221699;
HR (RM 52.3-111)	
Black Oak Creek	1941, UMMZ 221302;
Caney Creek	1941, UMMZ 221720;
Dodsons Creek	1941, UMMZ 221657;
German Creek	
Briar Fork Creek	1941, UMMZ 221826;
Narrow Valley Creek	1941, UMMZ 221882;
Panther Creek	1941, UMMZ 222439;
Poor Valley Creek	1941, UMMZ 221793; 1987, TWRA 18.155; 1991, UT 91.4101;
Turkey Creek	1941, UMMZ 169558;
Turley Spring	1941, UMMZ 221888;
HR (RM 0.0 - 52.3)	1991, UT 91.4027; 91.4044, 91.4117;
Beaver Creek	1953, CU 25616, 25726;
Flat Creek	1976, INHS 75140; 1986, TWRA 18.71; 1991, UT 91.3981;
Mill Spring Branch	1941, UMMZ 221859;
Richland Creek	1990, UT 91.3923;
Roseberry Creek	1990, UT 91.3908;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096880; 1940, CU 9973; 1951, CU 20688; 1954, ANSP 74190; UMMZ 169339; 1958, CU 46168; UAIC 2571.02; 1967, CU 63558; 1993, UT 91.4424;
Laurel Creek	1951, CU 20926; 1993, UT 91.4424;
NFHR (Washington Co., VA)	1954, ANSP 74228; 1978, OSUM 42445; 1988, VPI 06010101 003.08; 1990, INHS 58998; 1992, UAIC 10522.12; 1993, UT 91.4424;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46391; 1989, UT 91.3627; 1991, UT 91.3627;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1947, UMMZ 157500; 1967, CU 63513; 1992, UAIC 10600.02;
Straight Creek	1967, CU 63441;

H95. *Etheostoma blennioides* Rafinesque, 1819
greenside darter

Locality	Chronological Catalogue Numbers
SFHR (Sullivan Co., TN)	1947, UMMZ 157516, 157550, 157584, 157615; 1949, UMMZ 159015, 1980, ANSP 146057; 1990, ANSP 168676;
Horse Creek	1990, ANSP 168706, 168716; 1992, UT 91.4166;
Walker Fork	1992, UT 91.4166;
Reedy Creek	1978, UT 91.1517;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1958, CU 46173; 1993, UT 91.4416;
Bear Creek	
MFHR (Washington Co., VA)	1888, UMMZ 213094; 1992, UAIC 10598; 1993, UT 91.4416;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	1973, UT 91.791; 1977, UT 91.1729;
Doe Creek	
Roan Creek	1947, UMMZ 157448; 1977, UT 91.1728;
Watauga (Carter Co., TN)	1937, UMMZ 130831; 1947, UMMZ 157403;
Doe River	1953, CU 24513; 1984, UT 91.2761; 1988, UT 91.3699;
Elk River	1947, UMMZ 157424; 1977, UT 91.2577; 1978, UT 91.1764, 91.1769; 1992, UAIC 10486.09;
Watauga (Sullivan Co., TN)	

H96. *Etheostoma caeruleum* Storer, 1845
rainbow darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	1977, UT 91.1736;
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H97. *Etheostoma camurum* (Cope, 1870)
bluebreast darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1987, TWRA 18.144; 1991, UT 91.4052;
Beech Creek	1990, UT 91.3709;
HR (RM 52.3-111)	
Poor Valley Creek	1941, UMMZ 221800;
HR (RM 0.0 - 52.3)	1978, UT 91.1986; 1985, UT 91.3724;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1951, CU 20690; 1954, ANSP 117308; 1967, CU 63559; 1993, UT 91.4429;
Laurel Creek	1956, CU 51657;
NFHR (Washington Co., VA)	1988, VPI 06010101 003.08;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1970, UT 91.175; 1984, TWRA 18.32; 1989, UT 91.3626; 1990, ANSP 168695; 1991, UT 91.3626, 91.4023, 91.4052;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1930, ANSP 104529, 66204-66218; 1949, UMMZ 159010;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Elk River	1992, UAIC 10486.10;
Watauga (Sullivan Co., TN)	

H98. *Etheostoma chlorobranchium* Zorach, 1972
greenfin darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
Laurel Creek	
Beaverdam Creek	1982, UT 91.2450; 1986, TWRA 18.76; 1991, UT 91.2450; 91.4016;
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1964, UMMZ 183661, 183674, 183681, 1968, CU 53828; 1985, UAIC 9506.09; 1991, UT 91.4106;
Watauga (Johnson Co., TN)	1973, UT 91.789; 1978, UT 91.2004;
Watauga (Carter Co., TN)	
Doe River	1977, UT 91.1981; 1978, UT 91.2001;
Laurel Fork Creek	1978, UT 91.2000;
Elk River	1940, UMMZ 201864; 1977, UT 91.1992, 91.2002; 1978, UT 91.1988;
Stony Creek	1978, UT 91.2003;
Watauga (Sullivan Co., TN)	

H99. *Etheostoma flabellare* Rafinesque, 1819
fantail darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
Beech Creek	1990, UT 91.3710;
Terrill Creek	1975, UT 91.1135;
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
Flat Creek	1991, UT 91.3985;
Roseberry Creek	1990, UT 91.3909;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1888, UMMZ 213096; 1967, CU 63569;
Laurel Creek	1951, CU 20925; 1956, UMMZ 171326;
NFHR (Washington Co., VA)	
Big Tumbling Creek	1993, UT 91.4434;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1951, CU 20953; 1954, UMMZ 169348, 169369; 1992, UAIC 10505.08;
Dickey Creek	1940, CU 9930;
SFHR (Washington Co., VA)	1961, CU 37702; 1987, 06010102 031.01;
Laurel Creek	1940, UMMZ 201980; 1947, CU 19183; 1952, CU 21516;
Beaverdam Creek	1940, UMMZ 201886, 201877; 1978, UT 91.1746; 1981, UT 91.2267; 1982, UT 91.2267; 1991, UT 91.2267; 1986, TWRA 18.74;
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	1947, UMMZ 157583, 157614;
Horse Creek	
Walker Fork	1992, UT 91.4167;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1940, CU 9949; 1956, UMMZ 171352; 1962, CU 41843; 1970, UAIC 3799.06; 1993, UT 91.4413;
Bear Creek	1976, OSUM 43065; 1993, UT 91.4323;
Hungry Mother Creek	1971, UAIC 3997.09;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	1973, UT 91.788;
Blue Springs	1947, UMMZ 157383;

H99. *Etheostoma flabellare* Rafinesque, 1819
fantail darter

Locality	Chronological Catalogue Numbers
Doe Creek	1947, UMMZ 157469; 1969, UT 91.338; 1973, UT 91.793; 1977, UT 91.1747, 91.1763; 91.2885; 1978, UT 91.1740; 1985, UT 91.2845;
Roan Creek	1947, UMMZ 157451; 1977, UT 91.1758, 91.1762, 91.1763; 1978, UT 91.1768, 91.1983;;
Laurel Creek	1973, UT 91.806;
Watauga (Carter Co., TN)	
Doe River	1978, UT 91.1756; 1984, TWRA 18.14;
Laurel Fork Creek	1984, UT 91.2776;
Little Doe River	1984, UT 91.2763; 1985, UT 91.2781;
Elk River	1947, UMMZ 157383; 1969, UT 91.338; 1977, UT 91.1754, 91.1761, 91.1766, 91.1767; 1978, UT 91.2574; 1992, UAIC 10486.11;
Stony Creek	1978, UT 91.1749; 1991, UT 91.4017, 91.4026;
Little Stony Creek	1969, UT 91.338;
Watauga (Sullivan Co., TN)	

H100. *Etheostoma flavum* Etnier and Bailey, 1989
rainbow darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
Mossy Creek	1970, UAIC 3902.03;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H101. *Etheostoma jessiae* (Jordan and Brayton, 1878)
blueside darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
Beech Creek	1941, UMMZ 221675; 1990, UT 91.3713;
HR (RM 52.3-111)	
Cloud Creek	1941, UMMZ 221747;
German Creek	
Briar Fork Creek	1941, UMMZ 221816;
Ray Creek	1941, UMMZ 221830;
Poor Valley Creek	1941, UMMZ 221785;
HR (RM 0.0 - 52.3)	
Flat Creek	1986, TWRA 18.69; 1990, UT 91.3889, 1991, UT 91.3984, 91.3987;
Swanpond Creek	1991, UT 91.4100;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
Possum Creek	1970, CU 68500;
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Horse Creek	1992, UT 91.4169;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H102. *Etheostoma kennicotti* (Putnam, 1863)
stripetail darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
Swanpond Creek	1991, UT 91.4098;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H103. *Etheostoma percnurum* Jenkins, 1994
duskytail darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1947, UMMZ 197681;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1980, ANSP 146083; 1990, ANSP 168698; 1991, UT 91.4053; 1992, UAIC 10526.13; UT 91.4327;
Beech Creek	1990, UT 91.3711;
Big Creek	1941, UMMZ 221686; 1990, UT 91.3814;
HR (RM 52.3-111)	
German Creek	
Ray Creek	1941, UMMZ 221835;
Poor Valley Creek	1941, UMMZ 221796; 1987, TWRA 18.154; 1991, UT 91.4102;
HR (RM 0.0 - 52.3)	1978, UT 91.1989; 1991, UT 91.4028, 91.4045, 91.4119;
Flat Creek	1966, UT 91.40; 1976, INHS 75142; 1986, TWRA 18.72; 1990, UT 91.3887; 1991, UT 91.3982;
Roseberry Creek	1990, UT 91.3910;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096878; 1940, CU 9971, UMMZ 138519; 1951, CU 20689; 1954, ANSP 74188; UMMZ 169341; 1958, UAIC 2571.07; 1961, CU 38066; 1967, CU 63562; 1979, OSUM 38843; 1988, VPI 06010101 013.00; 1993, UT 91.4430;
Laurel Creek	1951, CU 20928; 1956, CU 51656; UMMZ 171325;
NFHR (Washington Co., VA)	1978, OSUM 42446; 1988, UAIC 8423.18; VPI 06010101 003.08; 1990, INHS 59005; 1992, UAIC 10522.13; 1993, UT 91.4425;
Big Tumbling Creek	1993, UT 91.4430;
NFHR (Scott Co., VA)	1954, ANSP 74240, 74242, 74244; 1987, UAIC 7922.17;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46243; 1968, UT 91.217; 1990, UT 91.3625;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1888, UMMZ 213093; 1951, CU 20956; 1992, UAIC 10505.09;
SFHR (Washington Co., VA)	1947, UMMZ 157499; 1965, ANSP 110733; 1967, CU 63515; 1980, ANSP 146033;
SFHR (Sullivan Co., TN)	1930, UT 91.23; 1947, UMMZ 157513, 157546, 157580; 1949, UMMZ 159012; 1977, UT 91.1518; 1978, UT 91.1755; 1980, ANSP 146056; 1990, ANSP 168677;
Horse Creek	1990, ANSP 168719; 1992, UT 91.4170;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1940, CU 9947, UMMZ 138520; 1961, CU 37898, 38083; 1962, CU 41844; 1970, UAIC 3799.07; 1993, UT 91.4414;

Locality	Chronological Catalogue Numbers
Hungry Mother Creek	1971, UAIC 3997.06;
MFHR (Washington Co., VA)	1888, UMMZ 213095; 1992, UAIC 10598.02; 1993, UT 91.4414;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	1947, UMMZ 157482; 1973, UT 91.790; 1978, UT 91.1987;
Doe Creek	
Roan Creek	1947, UMMZ 157446; 1977, UT 91.1743, 91.1748;
Watauga (Carter Co., TN)	1947, UMMZ 157404;
Doe River	1990, UT 91.3700;
Elk River	1947, UMMZ 157422; 1977, UT 91.1732; 1992, UAIC 10486.12;
Watauga (Sullivan Co., TN)	

H105. *Etheostoma simoterum* (Cope, 1868)
snubnose darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1980, ANSP 146085; 1992, UAIC 10526.14; UT 91.4328;
Beech Creek	1941, UMMZ 221674; 1990, UT 91.3712;
Big Creek	1941, UMMZ 221695; 1990, UT 91.3813;
HR (RM 52.3-111)	1941, UMMZ 222509;
Caney Creek	1941, UMMZ 221730;
Cedar Creek	1941, UMMZ 221613;
Cloud Creek	1941, UMMZ 221753;
Crockett Creek	1941, UMMZ 221715;
Dodsons Creek	1941, UMMZ 221656;
German Creek	
Briar Fork	1941, UMMZ 221824;
Ray Creek	1941, UMMZ 221834;
Mossy Creek	1941, UMMZ 221319;
Needmore Creek	1941, UMMZ 222495;
Panther Creek	1941, UMMZ 221353, 222438;
Poor Valley Creek	1941, UMMZ 221804; 1987, TWRA 18.153, 18.157; 1991, UT 91.4103;
Heck Branch	1991, UT 91.4103;
Red House Branch	1941, UMMZ 221766;
Turkey Creek	1941, UMMZ 169559;
Turley Spring	1941, UMMZ 221887;
War Creek	1941, UMMZ 222538;
HR (RM 0.0 - 52.3)	1991, UT 91.4029, 91.4046, 91.4118;
Beaver Creek	1969, CU 54799; 1953, CU 25731;
Buffalo Springs	1990, UT 91.3959;
Flat Creek	1976, INHS 75143; 1986, TWRA 18.70; 1990, UT 91.3888; 1991, UT 91.3983, 91.3986;
Mill Spring Branch	1941, UMMZ 221864;
Roseberry Creek	1990, UT 91.3911;
Swanpond Creek	1991, UT 91.4099;
North Fork (NFHR)	
NFHR (Bland Co., VA)	1933, USNM 102432; 1993, UT 91.4433;
NFHR (Smyth Co., VA)	1867, ANSP 14039-14054 (Syntypes) 14036-14038, 14499-14503, MNHN 4856; USNM 36604; 1928, UMMZ 096882; 1940, CU 9964; 1954, UMMZ 169340; 1958, UAIC 2571.06; 1967, CU 63563; 1979, OSUM 38844;
Beaver Creek	1928, UMMZ 096863;
Laurel Creek	1951, CU 20927; 1956, UMMZ 171327;
Lick Creek	1993, UT 91.4433;

H105. *Etheostoma simoterum* (Cope, 1868)
snubnose darter

Locality	Chronological Catalogue Numbers
NFHR (Washington Co., VA)	1937, UMMZ 130780; 1978, OSUM 42102; 1979, OSUM 38776; 1992, UAIC 10522.14;
NFHR (Scott Co., VA)	
Big Moccasin Creek	1938, UMMZ 129066;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46395; 1971, INHS 82728; 1990, INHS 59013; 1991, UT 91.4024, 91.4039;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1951, CU 20954; 1954, UMMZ 169349, 169368; 1976, OSUM 43076, 43054; 1979, OSUM 38877; 1992, UAIC 10505.10;
SFHR (Washington Co., VA)	1965, ANSP 110734; 1974, ANSP 132163; 1980, ANSP 146035;
Laurel Creek	1940, UMMZ 201891; 1961, CU 37704;
Beaverdam Creek	1940, UMMZ 201885; 1978, UT 91.1759; 1981, UT 91.2268; 1982, UT 91.2451; 1986, TWRA 18.62, 18.73;
Whitetop Laurel Creek	
SFHR (Sullivan Co., TN)	1947, UMMZ 157515, 157549, 157586, 157616, 159017; 1965, ANSP 110741, 110753; 1974, ANSP 132182, 132195; 1980, ANSP 146010, 146080; 1990, ANSP 168673, 168679, 168684, 168699;
Beaver Creek	1928, UMMZ 096853
Horse Creek	1990, ANSP 168702; 1992, UT 91.4168;
Walker Fork	1992, UT 91.4168;
Sinking Creek	1978, UT 91.1750;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1938, UMMZ 129098; 1940, CU 9950; 1952, CU 21493, 21539; ; 1956, UMMZ 171353; 1958, UAIC 2570.05; 1961, CU 37896; 1962, CU 41846; 1970, UAIC 3799.08; 1993, UT 91.4415;
Bear Creek	1938, UMMZ 129105; 1976, OSUM 43066; 1993, UT 91.4324;
Hungry Mother Creek	1971, UAIC 3997.10;
MFHR (Washington Co., VA)	1947, UMMZ 157502; 1993, UT 91.4415;
Byer Creek	1990, UT 91.4233;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Blue Springs	1947, UMMZ 157384;
Doe Creek	1947, UMMZ 157470; 1978, UT 91.1751, 91.1752;
Roan Creek	1947, UMMZ 157449;
Watauga (Carter Co., TN)	1991, UT 91.4043;
Doe River	1984, UT 91.2762; 1988, UT 91.3701;
Stony Creek	
Little Stony Creek	1969, UT 91.333;
Watauga (Sullivan Co., TN)	

H106.

Etheostoma spectabile (Agassiz)
orangethroat darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096877;
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H107. *Etheostoma swannanoa* Jordan and Evermann, 1889
Swannanoa darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	1888, USNM 39861 (Lectotype), 196771 (Paralectotype); 1951, CU 20951;
SFHR (Washington Co., VA)	
Laurel Creek	1947, CU 19181; 1952, CU 21511; 1961, CU 37630;
Beaverdam Creek	1940, UMMZ 201892; 1968, UT 91.185; 1973, UT 91.777; 1978, UT 91.1967; 1981, UT 91.2269; 1986, TWRA 18.75;
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1940, CU 9945; UMMZ 138521; 1958, CU 52372; 1961, CU 37900; 1962, CU 41842; 1970, UAIC 3799.09;
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	1947, UMMZ 157468; 1978, UT 91.1737; 1985, UT 91.2884;
Roan Creek	1947, UMMZ 157450; 1977, UT 91.1727, 91.1738; 1978, UT 91.1730;
Watauga (Carter Co., TN)	
Doe River	1978, UT 91.1753; 1984, TWRA 18.75; 1985, UT 91.2765; 1986, UT 91.2933;
Laurel Fork Creek	1984, UT 91.2777;
Elk River	1947, UMMZ 157423; 1977, UT 91.1735; 1983, UT 91.2575; 1992, UAIC 10486.13;
Watauga (Sullivan Co., TN)	

H108. *Etheostoma vulneratum* (Cope, 1870)
wounded darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1888, UMMZ 213097; 1928, UMMZ 104320; 1940, CU 10188; 1967, CU 63561; 1993, UT 91.4431;
NFHR (Washington Co., VA)	1993, UT 91.4431;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1947, UMMZ 157498; 1967, CU 63514;
SFHR (Sullivan Co., TN)	1930, ANSP 65188, 65189; 1947, UMMZ 157548, 157581, 157612; 1949, UMMZ 159011;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H109. *Etheostoma zonale* (Cope, 1868)
banded darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1987, TWRA 18.147; 1991, UT 91.4054; 1992, UAIC 10526.15;
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	1991, UT 91.4030;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1867, ANSP 13799 (Lectotype), 13800-13801 (Paralectotype); 1888, UMMZ 213099; 1928, UMMZ 096876; 1951, CU 20691; 1954, ANSP 74184; UMMZ 169342; 1967, CU 63564; 1979, OSUM 38845; 1993, UT 91.4432;
NFHR (Washington Co., VA)	1978, OSUM 42101, 42447; 1988, UAIC 8423.19; VPI 06010101 003.08; 1992, UAIC 10522.15; 1993, UT 91.4432;
NFHR (Scott Co., VA)	1987, UAIC 7922.18;
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46220; 1989, UT 91.3628;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1947, UMMZ 157501; 1967, CU 63516;
SFHR (Sullivan Co., TN)	1930, ANSP 66354-66355; 1947, UMMZ 157514, 157547, 157582, 157613; 1949, UMMZ 159016; 1980, ANSP 146055;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	1958, CU 52371;
MFHR (Washington Co., VA)	1992, UAIC 10598.03; 1993, UT 91.4417;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	1978, UT 91.1757;
Roan Creek	1947, UMMZ 157447;
Watauga (Carter Co., TN)	1947, UMMZ 157402;
Doe River	1988, UT 91.3702;
Laurel Spring Creek	
Elk River	1947, UMMZ 157421; 1978, UT 91.1741; 1992, UAIC 10486.14;
Watauga (Sullivan Co., TN)	

H110.

Percina aurantiaca (Cope, 1868)
tangerine darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1980, TVA 144.120, 144.121; 1990, UT 91.3822; 1991, UT 91.4055; 1992, UAIC 10526.16;
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1867, ANSP 13789 (Lectotype), ANSP 13790 (Paralectotype); 1976, TVA 144.49;
NFHR (Washington Co., VA)	1988, VPI 06010101 003.08;
NFHR (Scott Co., VA)	1972, RC REJ 669;
NFHR (Hawkins/Sullivan Co., TN)	1970, UT 91.497; 1976, TVA 144.48; 1991, UT 91.4025;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1970, UT 91.540;
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	1941, UMMZ 156985; 1964, UMMZ 183682, 1981, UNCC 81-920; 1991, UT 91.4107;
Watauga (Johnson Co., TN)	
Doe Creek	1977, UT 91.1510;
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H111. *Percina burtoni* Fowler, 1945
blotchside darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1867, ANSP 13707 (Paratype); 1951, CU 20686; 1976, UT 91.1964;
Laurel Creek	1973, UT 91.882;
NFHR (Washington Co., VA)	1993, UT 91.4423;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1947, UMMZ 157579, 157611;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H112.

Percina caprodes (Rafinesque, 1818)
logperch

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1992, UT 91.4329;
Beech Creek	1941, UMMZ 221679; 1990, UT 91.3714;
HR (RM 52.3-111)	1941, UMMZ 222523; 1949, CU 44025; 1952, CU 23293;
Briar Fork	1978, INHS 79162;
Dodsons Creek	1941, UMMZ 221661;
Mossy Creek	1952, CU 23293; 1991, UT 91.4277;
Poor Valley Creek	1941, UMMZ 221806; 1991, UT 91.4104;
HR (RM 0.0 - 52.3)	1991, UT 91.4031;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096881;
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1965, ANSP 110735; 1967, CU 63517; 1970, UT 91.542; 1980, ANSP 146034; 1992, UAIC 10600.03;
SFHR (Sullivan Co., TN)	1965, ANSP 110742; 1984, TWRA 18.16;
Horse Creek	1990, ANSP 168703;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	1973, UT 91.787;
Roan Creek	1973, UT 91.794;
Watauga (Carter Co., TN)	
Elk River	1969, UT 91.358; 1977, UT 91.2576; 1978, UT 91.1760;
Watauga (Sullivan Co., TN)	

H113. *Percina evides* (Jordan and Copeland, 1877)
gilt darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	1991, UT 91.4056;
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	1968, UT 91.151;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	1988, VPI 06010101 003.08; 1990, INHS 59006;
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	1963, CU 46402; 1968, UT 91.191; 1989, UT 91.3630;
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	1959, USNM 190946; 1964, TU 34585; USNM 188651; 1967, CU 63518;
SFHR (Sullivan Co., TN)	1947, UMMZ 157517, 157578;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Roan Creek	1947, UMMZ 157445; 1977, UT 91.1726;
Watauga (Carter Co., TN)	
Doe River	1953, CU 24511; 1984, UT 91.2764; 1988, UT 91.3703;
Elk River	1947, UMMZ 157425; 1992, UAIC 10486.15;
Stony Creek	
Watauga (Sullivan Co., TN)	

H114. *Percina macrocephala* (Cope, 1869)
longhead darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 096879;
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1947, UMMZ 157577, 157610;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	1888, USNM 40595;
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	1947, UMMZ 157401;
Doe River	1984, UT 91.2760;
Watauga (Sullivan Co., TN)	

H115.

Percina maculata (Girard)
orangethroat darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	1928, UMMZ 119678;
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Doe Creek	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H116.

Percina sciera (Swain)
dusky darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
Cedar Creek	1941, UMMZ 221614;
German Creek	
Ray Creek	1941, UMMZ 221836;
Noe Creek	1941, UMMZ 222455;
Panther Creek	1941, UMMZ 221344;
Poor Valley Creek	1941, UMMZ 221780; 1987, TWRA 18.156, 18.183; 1991, UT 91.4105;
Spring Creek	1941, UMMZ 221607;
HR (RM 0.0 - 52.3)	
Richland Creek	1990, UT 91.3924; 1991, UT 91.3924;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H117. *Percina squamata* (Gilbert and Swain, 1887)
olive darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	1973, UT 91.786; 1977, UT 91.1723;
Watauga (Carter Co., TN)	1888, UMMZ 187259;
Watauga (Sullivan Co., TN)	

H118.

Percina tanasi Etnier
snail darter

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	1991, UT 91.4267;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H119.

Stizostedion canadense (Smith, 1834)
sauger

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	1948, CU 11696;
HR (RM 0.0 - 52.3)	
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	1985, TWRA 18.42;
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

H120. *Aplodinotus grunniens* Rafinesque, 1819
freshwater drum

Locality	Chronological Catalogue Numbers
Holston River (HR)	
HR (RM 111-142)	
HR (RM 52.3-111)	
HR (RM 0.0 - 52.3)	1977, UMMZ 201151;
North Fork (NFHR)	
NFHR (Bland Co., VA)	
NFHR (Smyth Co., VA)	
NFHR (Washington Co., VA)	
NFHR (Scott Co., VA)	
NFHR (Hawkins/Sullivan Co., TN)	
South Fork (SFHR)	
SFHR (Smyth Co., VA)	
SFHR (Washington Co., VA)	
SFHR (Sullivan Co., TN)	
Middle Fork (MFHR)	
MFHR (Smyth Co., VA)	
MFHR (Washington Co., VA)	
Watauga River (Watauga)	
Watauga (Watauga Co., NC)	
Watauga (Johnson Co., TN)	
Watauga (Carter Co., TN)	
Watauga (Sullivan Co., TN)	

APPENDIX I

Holston River proper
36 collections from
HRM 0-52.3

1951, June 4-5. Holston River from Cherokee tailwater in spillway immediately below dam. Gill net and 2 hoop-nets. Grainger/Jefferson counties, Tennessee. Tennessee Game and Fish Commission. Best Source: Pfitzer (1954).

1952, October 23. Holston River at mouth of Mill Springs, 5.1 miles from Carson Newman College. Jefferson County, Tennessee. W.S. Woolcott (WSW 2356B) and Ecology Class. Best Source: CU 23302, 44521-44523.

1953, February 21. Holston River at mouth of Mill Springs, 5.1 miles west of Jefferson City. Jefferson County, Tennessee. W.S. Woolcott (WSW 2367) and Ecology Class. Best Source: CU 25532-25536.

1953, May 7. Holston River 1.5 miles downstream from Cherokee Dam. Grainger/Jefferson counties, Tennessee. Tennessee Game and Fish Commission. Rotenone sample. Best Source: Pfitzer (1954).

1953, May 16. Holston River 8 miles (HRM 44) downstream from dam at Blue Springs. Grainger/Jefferson counties, Tennessee. Tennessee Game and Fish Commission. Rotenone sample. Best Source: Pfitzer (1954).

1967, August 1. Holston River 1.5 miles below US 11E bridge (HRM 4). Knox County, Tennessee. D.A. Etnier and UT Ichthyology Class. Best Source: UT 44.180.

1968, April 9. Holston River 0.5 mile below US 11E bridge (HRM 4). Knox County, Tennessee. D.A. Etnier, R. Bouchard, Mackiewicz. Best Source: UT 91.151.

1969, August 7. Holston River 1.0 mile below US 11E bridge (HRM 4). Knox County, Tennessee. D.A. Etnier and UT Ichthyology Class.

1970, June 4. Holston River 1.0 mile below US 11E bridge on east side of island (HRM 4). Knox County, Tennessee. S.V. Gregory, H.L. Stirewalt, Mike Conover, D.A. Etnier (night seining). Best Source: UT 44.501, 44.503.

1974, October 10. Holston River at HRM 25.2. Grainger County, Tennessee. TVA crew. Best Source: Hill and Brown (1980).

1974, October 10. Holston River at HRM 51.2. Grainger County, Tennessee. TVA crew. Best Source: Hill and Brown (1980).

1977, June 27. Holston River to 6 miles above junction of French Broad River and Tennessee River. Knox County, Tennessee. W.J. Rainboth (WJR 77-10), Buth, and Etnier. Best Source: UMMZ 201147 - 201151.

1978, December. Holston River at Monday Island (HRM 14.1). Knox County, Tennessee. TVA. Best Source: UT 91.1986.

1980, November 20. Holston River 1.0 mile below US 11E bridge (HRM 4). Knox County, Tennessee. B.A. Bauer, D.A. Etnier, and UT Ichthyology Class. Best Source: UT 44.2851.

1983. Holston River near Strawberry Plains (HRM 14-17). J.R. Shute angling. Best Source: UT 36.13.

1985, May 20. Holston River at I-40. Knox County, Tennessee. C.F Saylor, Steve Ahlsted, Karley. Best Source: UT 44.4827, 91.3724.

1987, July 21-22. Holston River at Nance Ferry (HRM 33.3). Boat shocking and backpack shocking. TWRA. R.D. Bivens, David Lane, C.J. Ellison, S. Lambert, S. Strader. Best Source: Bivens (1988). TWRA 7.41, 10.24, 11.253, 17.18.

1989, Jan-May. Holston River at HRM 5-6. Repeated collections during 4 month period day and night collecting with boat shockers. TVA. Best Source: Yeager and Tomljanovich (1990).

1989, May. Holston River at HRM 44.0 at Blue Springs (Indian Cave). TVA IBI Station. Grainger/Jefferson counties, Tennessee. TVA crew. Best Source: Yeager and Tomljanovich (1990).

1989, May. Holston River at HRM 33.2 at Nance's Ferry. TVA IBI Station. Grainger/Jefferson counties, Tennessee. TVA Crew. Best Source: Yeager and Tomljanovich (1990).

1989, May. Holston River at HRM 25.0 McKinney Island. TVA IBI Station. Grainger County, Tennessee. TVA Crew. Best Source: Yeager and Tomljanovich (1990).

1991, April 8. Holston River at east side of island, 0.25 mi. downstream from I-40 bridge. Knox County, Tennessee. R.T. Bryant, W.C. Starnes. Best Source: UT 91.4267.

1991, May 6. Holston River at HRM 44.0 at Blue Springs (Indian Cave). TVA IBI Station. Grainger/Jefferson counties, Tennessee. TVA crew. Best Source: E. Scott, Norris Tennessee.

1991, May 8. Holston River at HRM 33.2 at Nance's Ferry. TVA IBI Station. Grainger/Jefferson counties, Tennessee. TVA Crew. Best Source: E. Scott, Norris Tennessee.

1991, May 9. Holston River at HRM 25.0 McKinney Island. TVA IBI Station. Grainger County, Tennessee. TVA Crew. Best Source: E. Scott, Norris Tennessee.

1991, July 5. Holston River at HRM 16.8 at East Bridge and Masot. Knox Co., Tennessee. David J. Eisenhour, Lynn V. Eisenhour, L.G. Hughes, and M.H. Hughes. (MHH 91.19) Best Source: UT 91.4027-91.4031, 129.361.

1991, Aug 22. Holston River at HRM 25.1 at Howell Rd. Grainger Co., Tennessee. David J. Eisenhour, Lynn V. Eisenhour, and M.H. Hughes (MHH 91.20). Best Source: UT 44.5378-44.5381, 45.966, 90.1319, 91.4044-91.4046, 129.364.

1991, Nov 19. Holston River at HRM 4.5 and 0.5 air miles below I-40 bridge. Knox Co., Tennessee. M.H. Hughes (MHH 91.54) and Patrick A. Myer.

1991, Nov 19. Holston River at HRM 16.8 at East Bridge and Masot. Knox Co., Tennessee. M.H. Hughes (MHH 91.55) and Patrick A. Myer.

1991, Nov 19. Holston River at HRM 44.0 at Mr. Ballinger's house and spring. Grainger Co, Tennessee. M.H. Hughes (MHH 91.56) and Patrick A. Myer.

1992, May 23. Holston River at island downstream of I-40 bridge. HRM 4.5. Knox County, Tennessee. David A. Eisenhour, Steve Frayley, Mark H. Hughes (MHH 92.42). Best Source: UT 44.6022, 85.71.

1993, May 9-10. Holston River at HRM 25.0 McKinney Island. TVA IBI Station. Grainger County, Tennessee. TVA Crew. Burns, Fales, Hansbourough, Matthews, Pickett, Scott, Trently.

1993, May 11. Holston River at HRM 44.0 at Blue Springs (Indian Cave). TVA IBI Station. Best Source: E. Scott, Norris Tennessee.

1993, May 11. Holston River at HRM 33.2 at Nance's Ferry. TVA IBI Station. Grainger County, Tennessee. TVA Crew. Best Source: E. Scott, Norris Tennessee.

1993, May 13. Holston River at HRM 44.0 at Blue Springs (Indian Cave). TVA IBI Station. Best Source: E. Scott, Norris Tennessee.

1993, May 9.. Holston River at HRM 4.5 and 0.5 air miles below I-40 bridge. Knox Co., Tennessee. M.H. Hughes (MHH 93.29).

Holston River (Cherokee Lake)
297 collections from
HRM 52.5-111

1940, Aug 9. Holston River at Brights Ferry. Hamblin County, Tennessee. C.S. Shoup. Tennessee Department of Conservation. Best Source: UMMZ 132016.

1941, April-June. Holston River near the dam site (*HRM 52.3*). *Fifty hoop-net lifts (1/24 hour period). Considered to be 50 collections. No county given.* C.G. Smith and TVA. Best Source: Smith and Miller (1942).

1941, April-June. Holston River about a mile below Morristown, Tennessee, about 23 miles upstream from the dam (*HRM 75.3*). *Fifty-seven hoop-net lifts (1/24 hour period). Considered to be 57 collections. No county given.* C.G. Smith and TVA. Best Source: Smith and Miller (1942).

1941, June. Holston River near Cherokee Dam. *No county given.* Smith. Best Source: Accession number Z200893 and cat no UMMZ 200893. (This specimen was probably one of the *Moxostoma* species reported in Smith and Miller (1942) based on the collection locality and date, but no connection has been made, yet.)

1941, Sept 10. Black Oak Branch just above mouth at Holston River. Tarzwell, Smith, and White (TVA 1941 S-50). Jefferson County, Tennessee. (Talbot, Tn 163-NW, 1940). Best Source: UMMZ 221299-221318.

1941, Sept 10. Mossy Creek 2 mile above mouth. Tarzwell, Smith, and White (TVA 1941 S-51). Jefferson County, Tennessee. (Joppa, Tn 155-NE, 1939). Best Source: UMMZ 221319-221326.

1941, Sept 10. Byrd's Spring Brook, trib to Mossy Creek, just above mouth. Tarzwell, Smith, and White (TVA 1941 S-52). Jefferson County, Tennessee. (Joppa, Tn 155-NE, 1939). Best Source: *Specimens at UMMZ but not catalogued.*

1941, Sept 10. Hull Branch at spring, trib to Holston River, Tarzwell, Smith, and White (TVA 1941 S-53). Hamblen County, Tennessee. (Talbott, Tn 163-NW, 1940). Best Source: UMMZ 221333-221334.

1941, Sept 10. Panther Creek just above mouth and below lowest highway crossing. Tarzwell, Smith, and White (TVA 1941 S-54). Hamblen County, Tennessee. (Talbott, Tn 163-NW, 1940).

1941, Sept 11. Busby Creek trib to Panther Creek, at Lawrence Mill, main stream and spring. Tarzwell, Smith, and White (TVA 1941 S-55). Hamblen County, Tennessee. (Talbott, Tn 163-NW, 1940). Best Source: UMMZ 222434-222437.

1941, Sept 11. Panther Creek, trib to Holston River, at second road crossing upstream. Tarzwell, Smith, and White (TVA 1941 S-56). Hamblen County, Tennessee. (Talbott, Tn 163-NW, 1940).

1941, Sept 11. Panther Creek, spring at headwaters. Tarzwell, Smith, and White (TVA 1941 S-57). Hamblen County, Tennessee. (Talbott, Tn 163-NW, 1940).

1941, Sept 11. Noe Creek, trib to the Holston River, at mouth and upstream 100 yards. Tarzwell, Smith, and White (TVA 1941 S-58). Hamblen County, Tennessee. (Avondale, Tn 162 SW, 1938).

1941, Sept 12. Spring Branch trib to Holston River where road crosses not far from Rock of Ages School. Tarzwell, Smith, and White (TVA 1941 S-59). Hamblen County, Tennessee. (Avondale, Tn 162 SW, 1938). Best Source: UMMZ 222474.

1941, Sept 12. Havley Spring Branch near jct with Turkey Creek. Tarzwell, Smith, and White (TVA 1941 S-60). Hamblen County, Tennessee. (Morristown, Tn 163 NE). Best Source: UMMZ 222475-222479.

1941, Sept 12. Turkey Creek, lower 100 yards. Tarzwell, Smith, and White (TVA 1941 S-61). Hamblen County, Tennessee. (Bean Station, Tn 162 SE). Best Source: UMMZ 169542-169565, 222861-222864.

1941, Sept 13. Stubblefield Branch, trib to Spring Creek. Tarzwell, Smith, and White (TVA 1941 S-62). Hamblen County, Tennessee. (Morristown, Tn 163 NE). Best Source: UMMZ 221578-221586.

1941, Sept 13. Spring Creek at mouth, trib to Holston River. Tarzwell, Smith, and White (TVA 1941 S-63). Hamblen County, Tennessee. (Bean Station, Tn 162 SE). Best Source: UMMZ 221587-221607.

1941, Sept 13. Cedar Creek, trib to the Holston River, at mouth. Tarzwell, Smith, and White (TVA 1941 S-64). Hamblen County, Tennessee. (Russelville, Tn 171 SW). Best Source: UMMZ 221608-221624.

1941, Sept 13. Fall Creek, trib to Holston River, 0.5 mi above mouth. Tarzwell, Smith, and White (TVA 1941 S-65). Hamblen County, Tennessee. (Russelville, Tn 171 SW). Best Source: UMMZ 222480-222493.

1941, Sept 13. Kellar Branch 0.5 mi above mouth, trib to Holston River. Tarzwell, Smith, and White (TVA 1941 S-66). Hamblen County, Tennessee. (Russelville, Tn 171 SW). Best Source: UMMZ 221625-221635, 222785.

1941, Sept 13. Needmore Creek at mouth and lower 150 yards. Tarzwell, Smith, and White (TVA 1941 S-67). Hamblen County, Tennessee. (Russelville, Tn 171 SW).

1941, Sept 14. Holston River at island 3 miles above Three Springs. Near Watermelon and Bingham Islands. Tarzwell, Smith, and White (TVA 1941 S-68). Hamblen County, Tennessee. (Russelville, Tn 171 SW).

1941, Sept 14. War Creek at mouth of Holston River. Tarzwell, Smith, and White (TVA 1941 S-69). Hawkins County, Tennessee. (Bulls Gap, Tn 171 SE).

1941, Sept 14. Robertson Creek at lowest highway x-ing near mill. Tarzwell, Smith, and White (TVA 1941 S-70). Hamblen County, Tennessee. (Bulls Gap, Tn 171 SE). Best Source: UMMZ 221636-221637. *Additional specimens at UMMZ not catalogued.*

1941, Sept 15. Honeycut Creek, trib to Holston River, at ,mouth from highway bridge down toward river. Tarzwell, Smith, and White (TVA 1941 S-71). Hawkins County, Tennessee. (Bulls Gap, Tn 171 SE). Best Source: UMMZ 221638-221649.

1941, Sept 15. Dodson's Creek, trib to Holston River, at highway bridge about 0.5 mi above mouth. Tarzwell, Smith, and White (TVA 1941 S-72). Hawkins County, Tennessee. (McCloud, Tn 180 SW). Best Source: UMMZ 221650-221671.

1941, Sept 15. Beech Creek at Highway running up Webster Valley. Tarzwell, Smith, and White (TVA 1941 S-73). Hawkins County, Tennessee. (Burem, Tn 180 NW).

1941, Sept 15. Big Creek trib to Holston River at lowest highway cbridge at mouth of Amis Branch. Tarzwell, Smith, and White (TVA 1941 S-74). Hawkins County, Tennessee. (Burem, Tn 180 NW).

1941, Sept 16. Crockett Creek about 2.25 miles above mouth. Tarzwell, Smith, and White (TVA 1941 S-75). Hawkins County, Tennessee. (171 NE). Best Source: UMMZ 221710-221719.

1941, Sept 16. Caney Creek at U.S. Hwy 11 bridge. Tarzwell, Smith, and White (TVA 1941 S-76). Hawkins County, Tennessee. (171 NE). Best Source: UMMZ 221720-221742.

1941, Sept 16. Cloud Creek, tributary to Holston River, at U.S. Hwy 11W bridge. Tarzwell, Smith, and White (TVA 1941 S-77). Hawkins County, Tennessee. (171 NE). Best Source: UMMZ 221743-221763.

1941, Sept 17. Red House Branch, tributary to the Holston River, just above U.S. 11W bridge. Tarzwell, Smith, and White (TVA 1941 S-78). Hawkins County, Tennessee. (Russellville, TN 171 NE).

1941, Sept 17. Poor Valley Creek at Highway bridge on U.S. 11W. Tarzwell, Smith, and White (TVA 1941 S-79). Hawkins County, Tennessee. (Russellville, TN 171 SW).

1941, Sept 17. Briar Fork and German Creek at junction. Tarzwell, Smith, and White (TVA 1941 S-80). Grainger County, Tennessee. (Bean Station, TN 162 SW). Best Source: UMMZ 221809-221828.

1941, Sept 17. Ray Creek at junction with German Creek. Tarzwell, Smith, and White (TVA 1941 S-81). Grainger County, Tennessee. (Bean Station, TN 162 SW). Best Source: UMMZ 221830-221856.

1941, Sept 18. Mill Spring Branch, tributary to the Holston River. Tarzwell, Smith, and White (TVA 1941 S-82). Grainger County, Tennessee. (Bean Station, TN 162 SW).

1948, Mar 29. Cherokee Reservoir. R.H Stroud (RHS 48 Mar 29). TVA Collection. *No county given.* Best Source: CU 11691, 11696.

1949-1991. Cherokee Lake. Cove rotenone samples by the Tennessee Valley Authority. *110 samples.* The number of annual samples is parenthesized and follows the year collected. 1949 (1), 1950 (1), 1951 (1), 1953 (1), 1955 (1), 1956 (1), 1957 (1), 1958 (1), 1959 (1), 1960 (3), 1963 (12), 1972 (3), 1973 (4), 1975 (7), 1976 (7), 1977 (7), 1978 (4), 1979 (4), 1980 (6), 1981 (2), 1982 (6), 1983 (4), 1984 (4), 1985 (4), 1986 (4), 1987 (4), 1988 (4), 1989 (4), and 1991 (4)

1949, Sept 20. Cherokee Reservoir at church graveyard near German Creek. Grainger County, Tennessee. W.W. Hassler (WWH 49 Sep 20). CU 44021-44025.

1949, Sept 20. Cherokee Reservoir, Riverside Church. *No county given.* TVA Collection. Best Source: UT 45.94. *This collection is surely the same as the one listed above.*

1952, Oct 10. Mossy Creek at mouth into Cherokee Reservoir. Jefferson County, Tennessee. W.S. Woolcott (WSW 2355), Max Bohner. Best Source: CU 24135, 23290-23295.

1954, Dec 8. Cherokee Reservoir near Jefferson City. Jefferson County, Tennessee. Joe Chapman. Best Source: CU 28522.

1968, May 10. Holston River just below John Sevier Steam Plant. Rogersville, Tennessee. *No county given.* Dave Bishop, Tennessee Game and Fish Commission, with shocker. Best Source: UT 45.58.

1972, April 4. Upper Cherokee Lake (Holston River) above Caney Creek embayment. Hawkins County, Tennessee. D. Bishop and F.L. Oakberg. Best Source: Oakberg (1973). UT 45.135-136.

1975, Sept. Cherokee Reservoir at US 25E and north of Morristown. (*No County given*) W.C. Starnes and L.B. Starnes. Best Source: UT Summary Collections of Fishes for 1975, or W.C. Starnes, USNM.

1983, Jan. 28. Cherokee reservoir at German Creek. Grainger County, Tn. Michael Humphreys. Best Source: TWRA 6.1,

1985, Dec 3. Cherokee reservoir D.E. Lane. Best Source: TWRA 9.6,

1986, April 18. Cherokee reservoir. Hamblen County, Tn. D.E. Lane. Best Source: TWRA 8.41, 8.42, 9.7,

1986, July 22. Cherokee reservoir. HRM 91.3. D.E. Lane. Hawkins County, Tn. Best Source: TWRA 11.106, 15.9, 15.10, 16.2, 17.14,

1986, Aug 7. Cherokee reservoir. HRM 91.3. D.E. Lane. Hawkins County, Tn. Best Source: TWRA 7.23, 9.10, 11.108, 15.11, 17.15,

1989, Fall. Cherokee reservoir. Inflow zone (*HRM 91.0*). Gill-netting (10 net nights), and electrofishing (100 minutes). *No county given*. TVA crew. Best Source: Hickman et al. (1991).

1989, Fall. Cherokee reservoir. Transition zone (*HRM 75.5*). Gill-netting (10 net nights), and electrofishing (100 minutes). *No county given*. TVA crew. Best Source: Hickman et al. (1991).

1989, Fall. Cherokee reservoir. Forebay zone (*HRM 53.0*). Gill-netting (10 net nights), and electrofishing (100 minutes). *No county given*. TVA crew. Best Source: Hickman et al. (1991).

1990, Fall. Cherokee reservoir. Inflow zone (*HRM 91.0*). Gill-netting (10 net nights), and electrofishing (100 minutes). *No county given*. TVA crew. Best Source: Hickman et al. (1991).

1990, Fall. Cherokee reservoir. Transition zone (*HRM 75.5*). Gill-netting (10 net nights), and electrofishing (100 minutes). *No county given*. TVA crew. Best Source: Hickman et al. (1991).

1990, Fall. Cherokee reservoir. Forebay zone (*HRM 53.0*). Gill-netting (10 net nights), and electrofishing (100 minutes). *No county given*. TVA crew. Best Source: Hickman et al. (1991).

1990, Aug 24. Holston River Mile between Southern Railroad and Hwy 66 Bridge and 2.5 air miles south of Rogersville. Hawkins Co., Tennessee. David J. Eisenhour, M.H. Hughes (MHH 90.34), and Patrick A. Myer. Best Source: UT 44.4977, 44.5117-44.5121, 45.905, 90.1255-90.1257, 91.3908-91.3911, 129.343.

1991, Nov 5. Cherokee Reservoir HRM 53.0. *No county given*. Gill-netting (10 net nights), and electrofishing (100 minutes). TVA crew. Best Source: Scott (1992).

1991, Nov 6. Cherokee Reservoir HRM 75.5. *No county given.* Gill-netting (10 net nights), and electrofishing (100 minutes). TVA crew. Best Source: Scott (1992).

1991, Nov 7. Cherokee Reservoir HRM 91.0. *No county given.* Gill-netting (9 net nights), and electrofishing (100 minutes). TVA crew. Best Source: Scott (1992).

1992, March 22. Poor Valley Creek embayment of Cherokee Lake. Hawkins County, Tennessee. Brad Houck angling on 8 lb test line. Specimen provided by Mark Fagg and Carl Williams of Tennessee Wildlife Authority. Best Source: UT 45.997

Holston River
14 collections from
HRM 111-126

1965, June 17. Holston River (in area known as Smith Bend), just SE of U.S. Hwy 11 at Church Hill. (HRM 136). Hawkins County, Tennessee. J.J. Loos and D. Yelton. ANSP Department of Limnology. Best Source: ANSP (1965), ANSP 110758-110773.

1974, June 28. Holston River near Rt. 11 bridge (HRM ? 142). N.R. Foster. ANSP. Best Source: ANSP 132196-132214.

1980, July 10. Holston River, SW of Church Hill at the McPheeter Bend Bridge (HRM 133). Hawkins County, Tennessee. P.E. Stacey and G.D. Constantz. Best Source: ANSP 146082-146096.

1987, May 13. Holston River at (HRM 119). C.F. Saylor and Baxter. TVA Crew. Best Source: Original Data sheets on file in UT Miscellaneous Fish Collections, or C.F. Saylor, TVA Water Resources, Norris, Tn..

1987, May 28. Holston River (HRM 118). C.F. Saylor and Baxter. TVA Crew. Best Source: Original Data sheets on file in UT Miscellaneous Fish Collections, or C.F. Saylor, TVA Water Resources, Norris, Tn..

1987, May 29. Holston River at Honeycutt Creek (HRM 113). C.F. Saylor and Baxter. TVA Crew. Best Source: Original Data sheets on file in UT Miscellaneous Fish Collections, or C.F. Saylor, TVA Water Resources, Norris, Tn..

1987, July 24. Holston River upstream from Surgoinsville Bridge (HRM 119.1). Hawkins County, Tennessee. R.D. Bivens, C.J. Ellison, D. Pollard, and E. Seay. Best Source: Bivens (1988). TWRA 8.59, 11.255, 15.20, 17.19.

1987, Aug 5. Holston River at Negro Island (HRM 135.9). Hawkins County, Tennessee. R.D. Bivens and C.J. Ellison. Best Source: Bivens (1988). TWRA 7.42, 10.25, 11.256-11.265, 18.144-18.147.

1990, July 2. Holston River (HRM 118), a TVA IBI site at Cox Island, near Surgoinsville. Hawkins County, Tennessee. C.F. Saylor and TVA crew. UT 44.4990-44.4994, 44.5797-44.5807, 91.3822, 91.4051-91.4056, 91.4327-29. and 129.414.

1990, July 21. Holston River (HRM 133) southwest of Church Hill, at McPheeter Bend Bridge. Hawkins County, Tennessee. ANSP. Best Source: ANSP 168692-168695, 168698.

1990, Aug 24. Holston River at Honeycutt Creek (HRM 113) between railroad crossing and Hwy 66 bridge, 2.5 air miles south of Rogersville. Hawkins County, Tennessee. M.H. Hughes (MHH 90.34), D.J. Eisenhour, and P.A. Myer. Best Source: UT 29.114, 44.4976-4980, 48.686, 85.64.

1991, June 12. Holston River (HRM 118), a TVA IBI site at Cox Island and at shoal below bridge at Surgoinsville. Hawkins County, Tennessee. Charlie F. Saylor and TVA crew. Best Source: UT Miscellaneous Fish Collections. UT 44.5387-44.5389, 45.971, 91.4051-91.4056, 129.368.

1992, June 24.. Holston River (HRM 118), a TVA IBI site at Cox Island, near Surgoinsville. Hawkins County, Tennessee. E.M. Scott and TVA crew. UT Miscellaneous Fish Collections. UT 44.4990-44.4992, 44.4994, 44.5797-44.5807, 91.3822, 91.4051-91.4052, 91.4054, 91.4327-29. and 129.414.

1992, Sept 25. Holston River (HRM 119) along River Rd., 1 mi E of Surgoinsville. Hawkins County, Tennessee. R.L. Mayden, B.R. Huhajda, R.M. Wood. Best Source: UAIC 10526.01-10526.16.

North Fork Holston River (Main Channel),
17 collections from
Hawkins/Sullivan counties, Tennessee.

1954, June 1. NFHR above mouth about 0.3 mi north of rt 11 crossing. T.M. Smith and R.D. Ross (554). VPIFC # 554.

1954, July 9. NFHR above mouth, about 0.2 mi north of rt 11 crossing. T.M. Smith and R.D. Ross (558). VPIFC # 558.

1954, July 9. NFHR 1/4 mi south of Va.-Tenn. state line, above cantilever bridge on Cleveland-Morrison City road. T.M. Smith and R.D. Ross (559). Best Source: CU 50382. VPIFC # 559.

1954, Aug 31. NFHR 0.5 mi above the mouth. T.M. Smith and R.D. Ross (611). Best Source: VPIFC # 611.

1954, Aug 31. NFHR 1/4 mi south of Va.-Tenn. state line, above cantilever bridge on Cleveland-Morrison City road. T.M. Smith and R.D. Best Source: Ross (612). VPIFC # 612.

1963, Aug 8. NFHR at Virginia/Tennessee state line in Hawkins County, Tennessee. E. Kotkas, T. Zorach, and C.F. Tsai. Best Source: CU 46220.

1963, Aug 9. NFHR approximately 2 air miles northwest of Kingsport on secondary road. E. Kotkas, T. Zorach (TZ 001), and C. F. Tsai. Best Source: CU 46243, 46391-46407.

1968, July 10. NFHR at Tenn Hwy 23. 0.25 miles south of Virginia state line. Sullivan County, Tennessee. Smythe, Gniska, Comiskey, Etnier. Best Source: UT 44.271,

1975, April 26. NFHR at Cloud Ford, river mi 4.6 ca. 4.2 air miles NW center of Kingsport, Tn. Robert E. Jenkins (702) and R.L. Dudley.

1975, Aug 4. NFHR at river mi 0.2 mi and at US Hwy 11W crossing. J. C. Feeman, Donley M. Hill, and TVA crew.

1975, Aug 26. NFHR at river mile 2.2. Robert E. Jenkins (927) , Noel M. Burkhead (701), and R.L. Dudley.

1976, Aug 7. NFHR at river mi 0.2 mi and at US Hwy 11W crossing. J. C. Feeman, and TVA crew.

1981, June 17. NFHR at river mile 2.2. off unnumbered county route. Robert E. Jenkins (927) , Noel M. Burkhead (577), M.D. Gibson (12), and W.H. Haxo (12).

1989, Dec 5. NFHR at TN 346. C.F. Saylor and TVA crew, Rick Bivens and TWRA crew. Best Source: UT 44.4689-4703, 45.826-828, 48.676-48.677, 91.3625-3630, 90.1158-901162.

1990, June 23. NFHR at rt 346 bridge. Larry M. Page, P.A. Ceas, D.A. Carney, Melvin L. Warren, and Brooks M. Burr. Best Source: INHS 59007-59013.

1991, June 28. NFHR between Clinchfield Railroad Bridge and 11W bridge. Hawkins County, Tennessee. David A. Eisenhour, Lynn V. Eisenhour, Lisa G. Hughes, Mark H. Hughes (MHH 91.11). Best Source: UT 44.4700, 44.5361-44.5371, 45.965, 90.1313, 91.4023-91.4025,

1991, Aug 15. NFHR at Hwy 346. Hawkins/ Sullivan County, Tennessee. David J. Eisenhour, Lynn V. Eisenhour, M.H. Hughes (MHH 91.14), and P.A. Myer. Best Source: UT 44.4690, 44.4692, 44.4694, 44.4695, 44.4698-44.4701, 45.826, 48.677, 48.725, 90.1158, 91.3626-91.3628, 91.3630.

North Fork Holston River (Main Channel)
57 collections from
Scott County, Virginia.

1954, June 12. NFHR 1.2 mi southeast of Hilton at the bridge east of Otter House Bluff. T. M. Smith and R.D. Ross. (RDR 555). Best Source: VPIFC # 555 (Ross and Carico, 1963).

1954, June 28. NFHR about 2 mi south of Big Moccasin Gap and 0.5 mi upstream from Jct St Rt 614. John Cairns, Jr and ANSP Dept Limnology (HOL54-4). Best Source: ANSP 74233-74255.

1954, July 18. NFHR at Hilton at steel bridge at Rt 58 crossing. W. Keeton and R. D. Ross (RDR 571). Best Source: VPIFC # 571. (Ross and Carico, 1963).

1954, Aug 7. NFHR at Holston Mill, above Hilton. T. M. Smith and R.D. Ross. (RDR 603). Best Source: VPIFC # 603. (Ross and Carico, 1963).

1954, Aug 7. NFHR at Tenn.-Va. state line. T. M. Smith and R.D. Ross. (RDR 604). Best Source: VPIFC # 604. (Ross and Carico, 1963).

1954, Aug 18. NFHR Foust Ford, below Hilton. T. M. Smith and R.D. Ross. (RDR 613). Best Source: VPIFC # 613. (Ross and Carico, 1963).

1954, Aug 31. NFHR Foust Ford, below Hilton. T. M. Smith and R.D. Ross. (RDR 614). Best Source: VPIFC # 614. (Ross and Carico, 1963).

1955, Aug 4. NFHR at Tenn.-Va. state line. F. Burleson and R.D. Ross. (RDR 630). Best Source: VPIFC # 630. (Ross and Carico, 1963).

1955, June 17. NFHR at Tenn.-Va. state line. F. Burleson and R.D. Ross. (RDR 638). Best Source: VPIFC # 638. (Ross and Carico, 1963).

1955, Oct 9. NFHR at Hilton at steel bridge at Rt 58 crossing. W. Keeton and R. D. Ross (RDR 640). Best Source: VPIFC # 640. (Ross and Carico, 1963).

1955, June 18. NFHR at Holston Mill, above Hilton. F. Burleson and R.D. Ross. (RDR 645). Best Source: VPIFC # 645. (Ross and Carico, 1963).

1955, July 1. NFHR at Tenn.-Va. state line. F. Burleson and R.D. Ross. (RDR 656). Best Source: VPIFC # 656. (Ross and Carico, 1963).

1955, July 2. NFHR at Holston Mill, above Hilton. F. Burleson and R.D. Ross. (RDR 642). Best Source: VPIFC # 642. (Ross and Carico, 1963).

1956, May 19. NFHR at U.S. rt 23 crossing. F. Burleson and R.D. Ross. (RDR 660). Best Source: VPIFC # 660. (Ross and Carico, 1963).

1956, June 2. NFHR at US Rt 23 crossing. R.D. Ross. (RDR 673). Best Source: VPIFC # 673. (Ross and Carico, 1963).

1967, July 25. NFHR off st rt 714 and 2.5 air mi southwest of Gate City. Robert F. Denoncourt and family. (RFD 67-66). Best Source: CU 62929-62942.

1970, Aug 1. NFHR at Click Island, river mi 6.2 and 0.5 river mi above confluence with Opossum (*sic*) Creek. 2.5 air mi south of Gate City. and Jct of 640 and 714. Robert E. Jenkins (376), and Tim Zorach.

1971, May 18. NFHR at Click Island, river mi 6.2 and 0.5 river mi above confluence with Opossum (*sic*) Creek. 2.5 air mi south of Gate City. Robert E. Jenkins (467), Noel M. Burkhead (8), and Mark A. Kuhl..

1971, June 26. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1972, March 13. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1972, May 16. NFHR 9.1 air mi ENE center of Gate City along rt 689. Robert E. Jenkins (552) and Noel M. Burkhead (37).

1972, June 4. NFHR at mill dam along rt 689, and 7.5 air mi east center Gate City. Robert E. Jenkins (568) and J. D. Jenkins.

1972, June 4. NFHR at island along rt 689; 9.1 air mi ENE center Gate City. Robert E. Jenkins (569) and J. D. Jenkins.

1972, June 12. NFHR at Holston Mill along Rt. 689 and 7.5 air mi east of center of Gate City. Robert E. Jenkins (575) and E. A. Lachner.

1972, June 12. NFHR at island along rt 689; 9.1 air mi ENE center Gate City. Robert E. Jenkins (576) and E. A. Lachner..

1972, June 16. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1973, Jan 18. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1973, April 17. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1973, July 9. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1973, Aug 27. NFHR 3.0 air mi SSW of center of Gate City at Click Island. Dick Fitz, C.F. Saylor, and TVA crew; and Noel M. Burkhead (153). Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1973, Aug 28. NFHR at Freeman Island off st rt 778 and 0.3 rd mi east of Jct st rt 614 and st rt 778. Dick Fitz and TVA crew; and Noel M. Burkhead (154). Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1974, April 22. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1974, May 20. NFHR at island along rt 689; 14.7 air km ENE center Gate City. Robert E. Jenkins (668) and Noel M. Burkhead (171).

1974, May 21. NFHR at Holston Mill along Rt. 689 and 7.5 air mi east of center of Gate City. Robert E. Jenkins (669) and Noel M. Burkhead (172).

1974, June 11. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1974, Aug 16. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. J.C. Feeman, Dick Fitz, C.F. Saylor, and TVA crew. Best Source: Thomas A. McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1974, Sept 17. NFHR at Freeman Island off st rt 778 and 0.3 rd mi east of Jct st rt 614 and st rt 778. Dick Fitz and TVA crew; and Noel M. Burkhead (154). Best Source: Thomas A. McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1975, April 24. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. J.C. Feeman, C.F. Saylor, TVA crew. Best Source: Thomas A. McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1975, Aug 5. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. J.C. Feeman, Donley M. Hill, and TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1975, Aug 5. NFHR at Freeman Island (river mi 13.4) off st rt 778 and 0.3 rd mi east of Jct st rt 614 and st rt 778. TVA crew. Best Source: Thomas A. McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1975, Aug 16. NFHR at Click Island, river mi 6.2 and 0.5 river mi above confluence with Opossum (sic) Creek. 2.5 air mi south of Gate City. Robert E. Jenkins (467), Noel M. Burkhead, and M.A. Kuhl..

1975, Aug 27. NFHR at Dorter Mill (RM 12.2). Robert E. Jenkins (705) and R.L. Dudley.

1975, Aug 27. NFHR at Holston Mill along Rt. 689 and 7.5 air mi east of center of Gate City. Robert E. Jenkins (706) and R.L. Dudley.

1975, Aug 27. NFHR at unnamed island, ri km 41.2, at mouth of Blue Springs Branch. Robert E. Jenkins (707) and R.L. Dudley.

1975, Aug 27. NFHR at Jett Ford, Rt. 689 & 6.6 air miles ENE Hilton. Robert E. Jenkins (708) and R.L. Dudley.

1976, April 21. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. J.C. Feeman, Donley M. Hill, and TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1976, Aug 3. NFHR at Click Island, river mi 6.3 and 0.8 river mi above confluence with Possum Creek. 36°35'55" N, 82°35'32" W. J.C. Feeman and TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980).

1976, Aug 3. NFHR at Freeman Island (river mi 13.4) off st rt 778 and 0.3 rd mi east of Jct st rt 614 and st rt 778. J.C. Feeman and TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980). Best Source: UT 44.3139.

1981, June 17. NFHR at Click Island, river mi 6.2 and 0.5 river mi above confluence with Opossum (sic) Creek. 2.5 air mi south of Gate City. Robert E. Jenkins (926), Noel M. Burkhead (576), W.H. Haxo (11) and MDG (11).

1981, June 17. NFHR at island at mouth of Blue Springs Branch along rt 689. Robert E. Jenkins (928), Noel M. Burkhead (578), W.H. Haxo (13) and MDGibson (13).

1981, June 18. NFHR rm 7.6 off co rt 614 near Weber City. Robert E. Jenkins (930), Noel M. Burkhead (580), M.D. Gibson (15), W.H. Haxo (15).

1981, June 18. NFHR at Holston Mill, rt 689, RM 23.4. Robert E. Jenkins (931), Noel M. Burkhead (581), Gibson (16), Haxo (16).

1981, June 18. NFHR at Hanes Island at RM 18.1 beyond end rt 896 (REJ) or 986 (NMB) Robert E. Jenkins (932), Noel M. Burkhead (582), M.D. Gibson (17), W.H. Haxo (17).

1983, June 16. NFHR at island at mouth of Blue Springs Branch along rt 689. Robert E. Jenkins (983), Noel M. Burkhead (766), Haxo (85), Maulfair (19), and S.P. McInish (46).

1984, June 6. NFHR at Holston Mill, rt 689, RM 23.4. and 1.5 mi air mi SE Hilton. Robert E. Jenkins (1101), Noel M. Burkhead (886), and Haxo (259).

1985, April 27. NFHR at Holston Mill off co rt 689. Noel m. Burkhead (938) and VIMS.

1987, Sept 22. NFHR on Co Rd 689 at Holston Mill, 2 miles ESE of Hilton. R.L. Mayden (RLM 87-59), B.R. Kuhajda, R.H. Matson. Best Source: 7922.01-7922.19.

North Fork Holston River (Main Channel)
89 collections from
Washington County, Virginia.

1937, Oct 7. NFHR below Saltville. TVA Map 212 SE. (at word "north"). A.R. Cahn and TVA crew. Best Source: UMMZ 130784-130791.

1953, Oct 8. NFHR at Mendota and steel bridge near BM 13-1348. T.M. Smith and R.D. Ross. (RDR 522). Best Source: VPIFC # 522. (Ross and Carico, 1963). CU 72108.

1953, Oct 8-9. NFHR at Mendota and steel bridge near BM 13-1348 on Oct 8 (see above collection RDR 522). In addition, on Oct 9 collected at Barker Mill, Mendota. T. M. Smith and R. D. Ross (RDR 523). Best Source: VPIFC # 523. (Ross and Carico, 1963). CU 34265;

1953, Oct 9. NFHR at Holston, 1.4 mi east (above) Holston bridge on Rt 58 crossing, formerly rt 19. T. M. Smith and R.D. Ross (RDR 524). Best Source: # 524. (Ross and Carico, 1963).

1954, June 13. NFHR at Mendota and steel bridge near BM 13-1348. T.M. Smith and R.D. Ross. (RDR 556). Best Source: VPIFC # 556. (Ross and Carico, 1963).

1954, June 28. NFHR 0.25 mi east (upstream) Jct St Rt 614 and St Rt 623. John Cairns, Jr. and ANSP Limnology Dept (HOL54-3). Best Source: ANSP 74220-74232.

1954, July 10. NFHR at Mendota and steel bridge near BM 13-1348. T. M. Smith and R.D. Ross (RDR 562). Best Source: VPIFC # 562. (Ross and Carico, 1963). CU 34267.

1954, July 10. NFHR 1.7 mi east of Holston at the ford, 0.3 mi west of Mongel Spring. T.M. Smith and R.D. Ross. (RDR 563). Best Source: VPIFC #563. (Ross and Carico, 1963).

1954, July 18. NFHR at Hayter's Gap and Rt 80 crossing. R.D. Ross. (RDR 560). Best Source: VPIFC # 560. (Ross and Carico, 1963).

1954, Aug 6. NFHR 6 river mi above Hayter's Gap and 6.5 mi below Hertytown bridge west of Saltville. R.D. Ross. (RDR 593). Best Source: VPIFC # 593. (Ross and Carico, 1963).

1954, Aug 6. NFHR 3 river mi above Hayter's Gap and 2.3 mi from Hayter's Gap on azimuth 89. T. M. Smith and R. D. Ross. (RDR 594). Best Source: VPIFC # 594. (Ross and Carico, 1963).

1954, Aug 6. NFHR 2 river mi above Hayter's Gap and 2 mi from Hayter's Gap on azimuth 99. T. M. Smith and R. D. Ross. (RDR 595). Best Source: VPIFC # 595. (Ross and Carico, 1963).

1954, Aug 16 (? 6). NFHR 1 river mi above Hayter's Gap and 1 mi from Hayter's Gap on azimuth 123.5. T. M. Smith and R. D. Ross. (RDR 596). Best Source: VPIFC # 596. (Ross and Carico, 1963).

1954, Aug 6. NFHR at Hayter's Gap and Rt 80 crossing. T. M. Smith and R. D. Ross. (RDR 598). Best Source: VPIFC # 598. (Ross and Carico, 1963).

1954, Aug 6. NFHR 2.1 mi west of Holston at west end of Hines Island; and 1.9 mi from Holston an azimuth 264. T. M. Smith and R. D. Ross. (RDR 600). Best Source: VPIFC # 600. (Ross and Carico, 1963). CU 34273.

1954, Aug 6. NFHR at Mendota and steel bridge near BM 13-1348. T.M. Smith and R.D. Ross. (RDR 601). Best Source: VPIFC # 601. (Ross and Carico, 1963).

1954, Sept 10. NFHR at Mendota and steel bridge near BM 13-1348. T.M. Smith and R.D. Ross. (RDR 616). Best Source: (Ross and Carico, 1963).

1954, Sept 10. Nordyke Bridge. T.M. Smith and R.D. Ross. (RDR 617). Best Source: (Ross and Carico, 1963).

1954, Sept 10. Fleenor Mill Pond and Ford. T.M. Smith and R.D. Ross. (RDR 618). Best Source: (Ross and Carico, 1963).

1954, Sept 10. NFHR 2.1 mi west of Holston at west end of Hines Island; and 1.9 mi from Holston an azimuth 264. T.M. Smith and R.D. Ross. (RDR 619). Best Source: (Ross and Carico, 1963).

1954, Sept 11. NFHR 1.7 mi east of Holston at the ford, 0.3 mi west of Mongel Spring. T.M. Smith and R.D. Ross. (RDR 620). Best Source: (Ross and Carico, 1963).

1954, Sept 11. Mendota, at the Mill Dam. T.M. Smith and R.D. Ross. (RDR 621). Best Source: (Ross and Carico, 1963).

1954, Oct 9. NFHR at Mendota and steel bridge near BM 13-1348. T.M. Smith and R.D. Ross. (RDR 639). Best Source: (Ross and Carico, 1963).

1955, June 18. NFHR at Mendota and steel bridge near BM 13-1348. F. Burleson and R.D. Ross. (RDR 629). Best Source: (Ross and Carico, 1963).

1955, July 1. Two miles below Saltville. F. Burleson and R.D. Ross. (RDR 641). Best Source: (Ross and Carico, 1963).

1955, July 2. NFHR at Hayter's Gap and Rt 80 crossing. F. Burleson and R.D. Ross. (RDR 648). Best Source: (Ross and Carico, 1963).

1955, Aug 3. NFHR at Hayter's Gap and Rt 80 crossing. F. Burleson and R.D. Ross. (RDR 653). Best Source: (Ross and Carico, 1963).

1955, Aug 3. NFHR at Mendota and steel bridge near BM 13-1348. F. Burleson and R.D. Ross. (RDR 634). Best Source: (Ross and Carico, 1963).

1955, Aug 3. NFHR 1.7 mi east of Holston at the ford, 0.3 mi west of Mongel Spring. F. Burleson and R.D. Ross. (RDR 647). Best Source: (Ross and Carico, 1963).

1955, Sept (?). Holston. F. Burleson and R.D. Ross. (RDR 382). Best Source: (Ross and Carico, 1963).

1955, Sept (?). NFHR at Mendota and steel bridge near BM 13-1348. F. Burleson and R.D. Ross. (RDR 384). Best Source: (Ross and Carico, 1963).

1956, May 19. NFHR at Mendota and steel bridge near BM 13-1348. T.M. Smith and R.D. Ross. (RDR 659). Best Source: VPIFC # 659. (Ross and Carico, 1963).

1956, June 2. NFHR at Mendota and steel bridge near BM 13-1348. T.M. Smith and R.D. Ross. (RDR 674). Best Source: VPIFC # ??? (Ross and Carico, 1963).

1956, June 2. NFHR at Holston. R.D. Ross. (RDR 677). Best Source: VPIFC # 677. (Ross and Carico, 1963).

1956, Aug 25. NFHR at Mendota and steel bridge near BM 13-1348. R.D. Ross. (RDR 743). Best Source: VPIFC # 743. (Ross and Carico, 1963).

1957, Oct 5. NFHR at Hayter's Gap and Rt 80 crossing. P.C. Holt, B. Abbott and R.D. Ross. (RDR 922). Best Source: VPIFC # 922. (Ross and Carico, 1963).

1957, Oct 5. NFHR near Mongel Spring; 2 mi above Rt 58 alternate crossing. P.C. Holt, B. Abbott and R.D. Ross. (RDR 923). Best Source: VPIFC # 923. (Ross and Carico, 1963).

1963, July 9. NFHR 1 mi east of Hayter's Gap and Logan Creek at bridge. William S. Woolcott and University of Richmond class (WSW 141). Best Source: UR 1593-1602.

1972, June 15. NFHR at Hayter's Gap (river mi 69.7). TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1972, Aug 11. NFHR at Hayter's Gap (river mi 69.7). TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1973, Jan 18. NFHR at Hayter's Gap (river mi 69.7). TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1973, Jan 19. NFHR 2 mi east of Rt. 80 bridge. R.E. Wolitz (REW 41).

1973, April 18. NFHR at Hayter's Gap (river mi 69.7). TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1973, April 18. NFHR off St Rt. 611 at Swinging Bridge (river mile 72.4) and 4 rd mi and 1.6 air mi northeast of Jct St Rt 80 and St Rt 611. TVA crew. . Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1973, July 10. NFHR at Hayter's Gap (river mi 69.7). TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1973, Aug 25. NFHR off St Rt 802 and 0.3 air mi southwest of Roebuck and 2.5 rd mi south of Jct of county rd 802 and US Hwy 19 at Hines Island (river mile 56.3). TVA crew and Noel M. Burkhead (NMB 155). Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1973, Aug 28. NFHR off St Rt 614 and 100 yds southwest of Jct St Rt 614 and St Rt 623. River mile 48 at Wooten's Gap. TVA crew and Noel M. Burkhead (155). Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1973, Aug 30. NFHR off St Rt. 611 at Swinging Bridge (river mile 72.4) and 4 rd mi and 1.6 air mi northeast of Jct St Rt 80 and St Rt 611. Dick Fitz, C.F. Saylor, and TVA crew and Noel M. Burkhead (157). Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1973, Aug 30. NFHR both sides of McKenna Island (river mile 78) off county rd. 611, and 1.6 river miles below confluence with Tumbling Creek. Dick Fitz, Charlie F. Saylor and TVA crew. Best Source: C.F. Saylor, Norris, TN. (Hill et al, 1980).

1974, April 22. NFHR off St Rt. 611 at Swinging Bridge (river mile 72.4) and 4 rd mi and 1.6 air mi northeast of Jct St Rt 80 and St Rt 611. J.C. Feeman, C.F. Saylor and TVA crew Best Source: C.F. Saylor, Norris, TN. (Hill et al, 1980).

1974, June 11. NFHR off St Rt. 611 at Swinging Bridge (river mile 72.4) and 4 rd mi and 1.6 air mi northeast of Jct St Rt 80 and St Rt 611. J.C. Feeman, C.F. Saylor and TVA crew Best Source: C.F. Saylor, Norris, TN. (Hill et al, 1980).

1974, Aug 17. NFHR off St Rt 614 and 100 yds southwest of Jct St Rt 614 and St Rt 623. River mile 48 at Wooten's Gap. Dick Fitz, C.F. Saylor, and TVA crew Best Source: C.F. Saylor, Norris, TN. (Hill et al, 1980).

1974, Aug 18. NFHR off St Rt 802 and 0.3 air mi southwest of Roebuck and 2.5 rd mi south of Jct of county rd 802 and US Hwy 19 at Hines Island (river mile 56.3). Dick Fitz, Charlie F. Saylor, Joe E. Feeman and TVA crew. Best Source: C.F. Saylor, Norris, TN. (Hill et al, 1980).

1974, Sept. 18. NFHR off St Rt. 611 at Swinging Bridge (river mile 72.4) and 4 rd mi and 1.6 air mi northeast of Jct St Rt 80 and St Rt 611. J.C. Feeman, C.F. Saylor and TVA crew Best Source: C.F. Saylor, Norris, TN. (Hill et al, 1980).

1974, Sept 19. NFHR both sides of McKenna Island (river mile 78) off county rd. 611, and 1.6 river miles below confluence with Tumbling Creek. Dick Fitz, Charlie F. Saylor and TVA crew. Best Source: C.F. Saylor, Norris, TN. (Hill et al, 1980).

1975, April 23. NFHR off St Rt. 611 at Swinging Bridge (river mile 72.4) and 4 rd mi and 1.6 air mi northeast of Jct St Rt 80 and St Rt 611. J.C. Feeman and TVA crew Best Source: C.F. Saylor, Norris, TN. (Hill et al, 1980).

1975, Aug 6. NFHR at Hayter's Gap (river mi 69.7). Joe E. Feeman and TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1975, Aug 8. NFHR off St Rt. 611 at Swinging Bridge (river mile 72.4) and 4 rd mi and 1.6 air mi northeast of Jct St Rt 80 and St Rt 611. J.C. Feeman, C.F. Saylor and TVA crew Best Source: C.F. Saylor, Norris, TN. (Hill et al, 1980).

1975, Aug 11. NFHR off St Rt 614 and 100 yds southwest of Jct St Rt 614 and St Rt 623. River mile 48 at Wooten's Gap. Donley Hill, Joe C. Feeman and TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1975, Aug 12. NFHR off St Rt 802 and 0.3 air mi southwest of Roebuck and 2.5 rd mi south of Jct of county rd 802 and US Hwy 19 at Hines Island (river mile 56.3). Donley Hill, Joe C. Feeman and TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1975, Aug 12. NFHR both sides of McKenna Island (river mile 78) off county rd. 611, and 1.6 river miles below confluence with Tumbling Creek. Donley Hill, Joe C. Feeman and TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1976, July 13. NFHR on Rt (?) off Hwy 58 and 3 mi below 58 bridge. Robert E. Jenkins (758) and Gene Grubitz. Best Source: Robert E. Jenkins (Roanoke College).

1976, Aug 5. NFHR off St Rt 802 and 0.3 air mi southwest of Roebuck and 2.5 rd mi south of Jct of county rd 802 and US Hwy 19 at Hines Island (river mile 56.3). Joe C. Feeman and TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1976, Aug 8. NFHR off St Rt. 611 at Swinging Bridge (river mile 72.4) and 4 rd mi and 1.6 air mi northeast of Jct St Rt 80 and St Rt 611. J.C. Feeman, C.F. Saylor and TVA crew Best Source: C.F. Saylor, Norris, TN. (Hill et al, 1980).

1976, Aug 8. NFHR off St Rt 614 and 100 yds southwest of Jct St Rt 614 and St Rt 623. River mile 48 at Wooten's Gap. Joe C. Feeman and TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1976, Aug 8-9. NFHR both sides of McKenna Island (river mile 78) off county rd. 611, and 1.6 river miles below confluence with Tumbling Creek. Joe C. Feeman and TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, TN. (Hill et al, 1980).

1978, July 2. NFHR at St Rt 19 and 6.75 mi northeast of Abingdon at town of Holston. Craig C. Ciola, K.L. Ciola and Gary M. Wargowsky. (OSU 1978: VII:5). Best Source: OSU 42092-42102.

1978, Oct 9. NFHR at St Rt 19 bridge and 6.75 mi northeast of Abingdon at Holston. Craig C. Ciola, and Gary M. Wargowsky. (OSU 1978: X:13). Best Source: OSU 42436-42448

1979, March 21. NFHR at st rt bridge 19 and 6.8 mi northwest of Abingdon at village of Holston. Craig C. Ciola (CRC 79-6). Best Source: (OSU 1979:IV:10). OSU 38767-38776.

1982, May 19. NFHR at rt 614 bridge at Mendota, RKM 62.9. Elevation 1335'. Robert E. Jenkins (949), Haxo (56); McIninch (10). Best Source: Robert E. Jenkins (Roanoke College).

1981, Aug 13. NFHR at Barker Mill off co rt 614, 0.6 air mi southwest of Jct 614-615 in Mendota. Noel M. Burkhead (610), M.D. Gibson (37) and W.H. Haxo (37).

1981, Aug 14. NFHR just below Fleenor Mill Ford off co rt 614, and 2.4 air mi ENE of Mendota. Noel M. Burkhead (612), W.H. Haxo (39), and M.D. Gibson (39).

1981, Aug 14. NFHR off co rt 614 at Hobbs Ford, and 1 air mi E of Mendota. Noel M. Burkhead (613), W.H. Haxo (40), and M.D. Gibson (40).

1981, Aug 14. NFHR off co rd 615 at island, 0.45 air mi south of Jct Co Rts 614 and 615. Noel M. Burkhead (614), W.H. Haxo (41) and MDG (4).

1983, June 16. NFHR at Hobbs Ford, Rm 42.5-42.7 and 1 air mi ENE Mendota. Robert E. Jenkins (982), Noel M. Burkhead (765), W.H. Haxo (84), M.D. Maulfair (18) and S.P. McIninch (45). Best Source: Robert E. Jenkins (Roanoke College).

1983, June 22. NFHR at Fleenor Mill Ford RM 44.6 and at southward bend of river and 0.5 rd mi below Hobbs Ford and at Hobbs Ford. Robert E. Jenkins (993), Noel M. Burkhead (776), Haxo (95), Maulfair (29) and McIninch (56). Best Source: Robert E. Jenkins (Roanoke College).

1983, June 22. NFHR at Barker Mill Dam and 0.65 air mi W Mendota off co rt 614. Robert E. Jenkins (994), Noel M. Burkhead (777), Haxo (96), Maulfair (30) and McIninch (57). Best Source: Robert E. Jenkins (Roanoke College).

1983, June 22. NFHR at island off co rt 615 and 0.8 air mi S Mendota. Robert E. Jenkins (995), Noel M. Burkhead (778), Haxo (97), Maulfair (31) and McIninch (58). Best Source: Robert E. Jenkins (Roanoke College).

1983, July 6. NFHR at "peatail island" off co rt 802, 0.95 rd mi ESE North Fork Holston Church at end private rd. Noel M. Burkhead (779), W.H. Haxo (117), and S.P. McIninch (78).

1983, July 6. NFHR at end co rt 872 at Buffalo Ford, ca river mile 51.3. Noel M. Burkhead (780), W.H. Haxo (119), and S.P. McNinch (80).

1983, July 6. NFHR at Hobbs Ford, 1.0 air mi ENE Mendota. Noel M. Burkhead (781), W.H. Haxo (118), and S.P. McNinch (79).

1984, June 6. NFHR at Buffalo Ford rm 51.3, co rt 872, 1.6 air mi E Zenobia. Robert E. Jenkins (1102), Noel M. Burkhead (887), and W.H. Haxo (260).

1984, June 6. NFHR at "Peatail Island" Rm 52.3-52.6, ford on unnumbered dirt road, 2.5 air mi E. Zenobia, and 0.95 rd mi ESE of North Fork Holston Church. Robert E. Jenkins (1103), Noel M. Burkhead (888), and Haxo (261).

1988, July 1. NFHR at Hobbs Ford, 1.9 km east of Mendota off County Road 614. B.R. Kuhajda, R.L. Mayden (RLM 88-43), M.T. Ferguson, R.H. Matson. Best Source: UAIC 8423.01-8423.19.

1988, Aug 26. NFHR (at Mendota) 1 km downstream from the rt 615 bridge. Mendota quadrangle. (longitude 821909 and latitude 364210). Best Source: VPI 06010101 003.08.

1990, June 23. NFHR 1.5 mi SW Mendota. Larry M. Page, P.A. Ceas, D.A. Carney, Melvin L. Warren, and Brooks M. Burr. Best Source: INHS 58992-59006.

1992, Sept 26. NFHR just NE of Mendota along co rd, near VA Hwy 640 and 802. B.J. Kuhajda, R.L. Mayden, R.M. Wood. Best Source: 10522.01-10522.15.

1993, June 27. NFHR off st rt 611 and 2.0 rd km west of Washington/Smyth county line. Tracy Hartman, P.A. Myer (PAM 106). Best Source: UT 44.5983, 44.5989, 48.798, 91.4413, 91.4432.

North Fork Holston River (Main Channel).
44 collections from
Smyth County, Virginia.

1867, October. NFHR vicinity of Saltville, Smyth County, Virginia. Edward Drinker Cope. Best Source: (Cope, 1867; Fowler 1907; Fowler, 1913; Colette and Knapp, 1967; Tsai and Raney, 1974; Jenkins in litt., 1993, Jenkins and Burkhead, 1994) ANSP.

1888, Aug 8. NFHR at ford in the river 1 mi north of Saltville. Various places for about 0.25 mi. above the ford and about 1 mi. below the ford. David Starr Jordan et al. Best Source: UMMZ, 144489, USNM 040455 (Jordan et al, 1889).

1928, July 9. NFHR, above Saltville. H.R. Becker (HRB 28-29, 30) and party. Best Source: UMMZ 096873-096901.

1933, Sept 12. NFHR at Broadford. George S. Myers (GSM 17) and Reid. Best Source: Robert E. Jenkins (Roanoke College).

1940, April 1. NFHR 2 mi northeast of Saltville. E. A. Lachner and E.C. Raney. (ECR 0710). Best Source: CU 9963-9973, 10188, 10191.

1951, June 8. NFHR 2.3 mi. southwest of Broadford on Str Rt. 91. E.C. Raney (ECR 2039) and C.R. Robins. Best Source: CU 20685-20698, 50591.

1954, June 28. NFHR just above St. Rt. 633 bridge and 3 mi. above (West) of Saltville. John Cairns, Jr. (HOL54-1) Best Source: ANSP 74181-74201.

1954, July 17. NFHR 1.8 mi east of Broadford. W. Keeton and R. D. Ross. (RDR 566). Best Source: VPIFC #566. (Ross and Carico, 1963).

1954, July 17. NFHR at bridge 6 mi. east of Saltville and one mi. east of North Holston and 2.9 mil east of McCrady. W. Keeton and R.D. Ross. (RDR 568). Best Source: VPIFC #568. (Ross and Carico, 1963).

1954, July 17. NFHR at Saltville, at bridge just east of town cemetery. W. Keeton and R.D. Ross (RDR 569). Best Source: VPIFC # 569. (Ross and Carico, 1963).

1954, Aug 5. NFHR 1.2 mi. from Chatham Hill on azimuth 77.5. T.M. Smith and R.D. Ross. (RDR 587). Best Source: VPIFC # 587. (Ross and Carico, 1963).

1954, Aug 5. NFHR at Chatham Hill. T.M. Smith and R.D. Ross. (RDR 588). Best Source: VPIFC # 588, (Ross and Carico, 1963) CU 34259, 47998, 48006.

1954, Aug 5. NFHR at Riverside, 6 mi. from Chatham Hill on azimuth 249. T.M. Smith and R.D. Ross. (RDR 588). Best Source: VPIFC # 588. (Ross and Carico, 1963).

1954, Aug 5. NFHR at bridge 1.5 mi. from Chatham Hill on azimuth 239. T.M. Smith. Best Source: VPIFC # 590. (Ross and Carico, 1963)..

1954, Aug 5. NFHR at Saltville, at bridge just east of town cemetery. T.M. Smith. Best Source: VPIFC # 591. (Ross and Carico, 1963)..

1955, July 1. NFHR 0.25 mi. east of bridge on St. Rt. 91. northeast of Saltville. Carter R. Gilbert and E.M. Gilbert. (CRG 8). Best Source: UMMZ 169332-169342.

1955, July 1. NFHR 1 mile below Chatham Hill. F. Burleson and R.D. Ross. (RDR 637). Best Source: VPIFC # 637. (Ross and Carico, 1963). CU 47995, 53296.

1956, June 1. NFHR 1 mile below Chatham Hill. R. Hoffman, F. Burleson D. Robinson and R.D. Ross. (RDR 689). Best Source: VPIFC # 689. (Ross and Carico, 1963). CU 32040, 32059, 48009.

1958, July 9. NFHR 0.5 mi. north of St Rt 16 bridge and 1.4 mi southeast of Jct St Rt 16 and St Rt 47. Chatham Hill area. William S. Woocott and Universtiy of Richmond class. (WSW 62). Best Source: UR 938-958, and UAIC 2571.01-2571.07.

1958, July 10. NFHR off St Rt. 42 and 3.8 mi north of Jct St Rt 16 and St Rt 42. William S. Woolcott and University of Richmond class (WSW 64). Best Source: UR 899-916.

1958, Sept 10. NFHR at Riverside, 6 mi. from Chatham Hill on azimuth 249. J. T. Wakeman, I.K. Cook and R.D. Ross. (RDR 1024). Best Source: VPIFC # 1024. (Ross and Carico, 1963). CU 43614, 46168.

1959 Sept 4. NFHR 0.25 mi. east of bridge on St. Rt. 91, northeast of Saltville. R. Taylor and Kanazansa. Best Source: USNM 190972.

1961, June 9. NFHR 3 mi downstream from Broadford. W.J. Richards, G.W. Bane and R. Miller. (WJR 111). Best Source: CU 38065-38072.

1963, July 2. NFHR at Nebo. R.D.Ross (RDR 1397), Robert E. Jenkins (#75), W.S. Woolcott and Mountain Lake Ichthyology class. Best Source: Robert E. Jenkins (Roanoke College).

1963, July 2. NFHR 1 mi east of Riverside at bridge and Jct of Co Rd 620 and Co Rd 716. R.D.Ross (RDR 1398), Robert E. Jenkins (#76), W.S. Woolcott and Mountain Lake Ichthyology class. Best Source: Robert E. Jenkins (Roanoke College). VPIFC # 1398, UR 1977 and CU 48011.

1967, Nov 24. NFHR 2.5 rd mi WSW of Broadford at Rt 91. Robert F. Denoncourt et al (RFD 67-156). Best Source: CU 63541-63564.

1970, Aug 5. NFHR off Rt. 91 at east edge of Saltville, and 0.5 rd mi above rt 91 bridge. Robert E. Jenkins and Tim Zorach. Best Source: Robert E. Jenkins (Roanoke College).

1971, June 28. NFHR on Rt. 16 at Rich Valley. Frank J. Schwartz (FJS 3). Best Source: Robert E. Jenkins (Roanoke College).

1971, June 30. NFHR at Neil Bridge (RM 88.6) off county Rd 633 and 0.5 rd mi south of Jct with Hwy 91. TVA crew. Best Source: Thomas A. McDonough, TVA Knoxville, TN. (Hill et al, 1980).

1971, Aug 4. NFHR at old Broad Ford (RM 91.4) off Hwy 91 and 4.5 mi northeast of McCready. Fitz, C.F. Saylor and TVA crew. Best Source: C.F. Saylor, TVA, Norris, TN. (Hill et al, 1980).

1973, Aug 31. NFHR at Neil Bridge (RM 88.6) off county Rd 633 and 0.5 rd mi south of Jct with Hwy 91. Fitz, C.F. Saylor and TVA crew. Best Source: C.F. Saylor, TVA, Norris, TN. (Hill et al, 1980).

1973, May 5. NFHR at east end of Saltville along Rt 41-42 in McCready suburb. Robert E. Jenkins (638), J.A. Musick (73-74), Noel M. Burkhead (139), R.K. Johnson, and VIMS class. Best Source: Robert E. Jenkins (Roanoke College).

1973, Oct 6. NFHR off St Hwy 91 and east of Saltville. James R. Reed and Virginia Commonwealth University class. (JRR 1033). Best Source: Robert E. Jenkins (Roanoke College).

1974, May 19. NFHR at old Broad Ford (RM 91.4) off Hwy 91 and 4.5 mi northeast of McCready. Fitz, C.F. Saylor and TVA crew. Best Source: C.F. Saylor, TVA, Norris, TN. (Hill et al, 1980).

1974, June 10. NFHR at old Broad Ford (RM 91.4) off Hwy 91 and 4.5 mi northeast of McCready. TVA crew. Best Source: C.F. Saylor, TVA, Norris, TN. (Hill et al, 1980).

1975, April 28. NFHR at old Broad Ford (RM 91.4) off Hwy 91 and 4.5 mi northeast of McCready. Fitz, C.F. Saylor and TVA crew. Best Source: C.F. Saylor, TVA, Norris, TN. (Hill et al, 1980).

1975, Aug 7. NFHR at Chatham Hill bridge. Donley M. Hill, Joe C. Feeman and TVA crew. Best Source: Thomas A. McDonough, TVA Knoxville, TN. (Hill et al, 1980).

1975, Aug 13. NFHR at old Broad Ford (RM 91.4) off Hwy 91 and 4.5 mi northeast of McCready. Donley M. Hill, Joe C. Feeman and TVA crew. Best Source: Thomas A. McDonough, TVA Knoxville, TN. (Hill et al, 1980).

1975, Aug 13. NFHR at Neil Bridge (RM 88.6) off county Rd 633 and 0.5 rd mi south of Jct with Hwy 91. Donley M. Hill, Joe C. Feeman and TVA crew. Best Source: Thomas A. McDonough, TVA Knoxville, TN. (Hill et al, 1980).

1976, Feb 20. NFHR at old Broad Ford (RM 91.4) off Hwy 91 and 4.5 mi northeast of McCready. TVA crew. Best Source: Thomas A. McDonough, TVA Knoxville, TN. (Hill et al, 1980).

1976, June 15. NFHR at Rt 16 crossing, 0.5 miles west of Chatham Hill. E.R. Cooper (ELC-B-1680) and R.E. Strauss (RES 4).

1976, Aug 10. NFHR at old Broad Ford (RM 91.4) off Hwy 91 and 4.5 mi northeast of McCready. Joe C. Feeman TVA crew. Best Source: Thomas A. McDonough, TVA Knoxville, TN. (Hill et al, 1980).

1976, Aug 10. NFHR at Chatham Hill bridge. Joe C. Feeman and TVA crew. Best Source: Thomas A. McDonough, TVA Knoxville, TN. (Hill et al, 1980).

1979, March 22. NFHR above Saltville at St Rt 630, behind Rich Valley High School, 8.3 mi ENE of Saltville, and 8.8 mi northwest of Marion. Craig C. Ciola. (CC 79-11.) Best Source: OSU 38839-38846.

1981. NFHR at Saltville, river mile 86.9. J.C. Widlak. Best Source: (Feeman, 1986).

North Fork Holston River (Main Channel)
5 collections from
Bland County, Virginia.

1933, June 5. NFHR 3 mi south of Sharon Springs off Rt. 427. Earl D. Reid. (EDR 12). Best Source: USNM 102429.

1956., April 20. NFHR 0.5 mi. northeast of Ceres on Rt. 42, F. Burleson and R.D. Ross. (RDR 657). Best Source: VPIFC 657. (Ross and Carico, 1963).

1956, April 20. NFHR at Tilson's Mill. F. Burleson and R.D. Ross. (RDR 676). Best Source: Best Source: VPIFC 676. (Ross and Carico, 1963)..

1956, April 20. NFHR 0.5 mi. from the Jct of Rt. 621 and Rt. 622. F. Burleson and R.D. Ross. (RDR 676). Best Source: Best Source: VPIFC 676. (Ross and Carico, 1963).

1993, June 30. NFHR at Jct of St Rts 622 and 626. P.A. Myer (PAM 119). Best Source: 44.5981, 91.4433.

South Fork Holston River (main channel).
18 collections from
TN Sullivan County
at Kingsport

1965, June 17. SFHR at Kingsport, ca 3.5 mi SW of jct. of Hwy. 81A and U.S. Hwy. 23, 2 mi from Ft Patrick Henry Dam (HOL 65-2). J.Loos and ANSP Dept. Limnology

1965, June 17. SFHR at Kingsport, by-pass sluice, ca. 2000 ft above confluence with South Fork of Holston R., just S of Hwy. 11W (HOL 65-4) J.Loos and ANSP Dept. Limnology

1965, June 17. SFHR at Kingsport, just upstream from the confluence of the North and South Forks. (HOL 65-5). J.Loos and ANSP Dept. Limnology

1974, June 27. SFHR at Kingsport, below Ridgefield C.C. above confluence North and South Forks. (HOL 74-5). N.R. Foster and ANSP.

1974, June 28. SFHR at Kingsport, sluice 2000 ft above confluence with the South Fork. (HOL 74-4). N.R. Foster and ANSP.

1974, June 29. SFHR, at Kingsport, 1.5 miles below Wilcox Bridge. (HOL 74-3). N.R. Foster and ANSP.

1974, June 29. SFHR at Kingsport, 2 mi below Ft Patrick Henry Dam (HOL 74-2). N.R. Foster and ANSP.

1980, July 11. SFHR at Kingsport, just upstream of confluence with N. Fork Holston River on the S. Fork Holston River, right bank (HOL 80-5). P.E. Stacey, G.D. Constantz, ANSP.

1980, July 12. SFHR at Kingsport, just upstream of confluence with N. Fork Holston River on the S. Fork Holston River, left bank (HOL 80-5L). P.E. Stacey, G.D. Constantz, ANSP.

1980, July 12. SFHR at Kingsport, sluiceway 2000 ft above confluence with S. Fork Holston River (HOL 80-4). P.E. Stacey, G.D. Constantz, ANSP.

1980, July 14. SFHR at Kingsport, 1.5 miles below Ft. Patrick Henry Dam (HOL 80-2). P.E. Stacey, E.K. Jankowski, and ANSP.

1980, July 14. SFHR at Kingsport, off Rt. 93A ca 1.5 miles below Wilcox Drive Bridge (HOL 80-3L). P.E. Stacey, G.D. Constantz, ANSP.

1989, Dec 12. SFHR at Kingsport, just above mouth of North Fork. J.L. Wilson, John Taylor, Brian Brazil, Marcia Sossamon, Dana Simerly. Electrofishing. Best Source: UT 45.832;

1990, July 15. SFHR at Kingsport, approx 1.5 miles below Ft. Patrick Henry Dam ; below Route 36 and above Route 93. (HOL 90-2). ANSP Dept Environ.

1990, July 15. SFHR at Kingsport, Big Sluice, 2000 ft above its confluence with South Fork up to RR bridge. (HOL 90-4). ANSP Dept Environ.

1990, July 16. SFHR at Kingsport, off Rt. 93A ca 1.5 miles below Wilcox Drive Bridge (HOL 90-3). ANSP Dept Environ.

1990, July 17. SFHR at Kingsport, between Ridgefields Rd. and confluence with N. Fork Holston River. (HOL 90-5). ANSP Dept Environ.

1991, Sept 26. SFHR at Kingsport, electrofishing. J.L. Wilson, D.R. Lindbom, C.E. Skelton, et al.

South Fork Holston River (main channel).
18 collections from
TN Sullivan County
lotic collections in vicinity of South Holston Dam

1930, June 18. SFHR 4 miles above Bluff City. J.G. Carlson and T. Kerr. Best Source: (Jenkins and Burkhead, 1975) ANSP 117307.

1930, June 20. SFHR 6 or 7 miles above and just below Muddy Creek. Bluff City. J.G. Carlson and T. Kerr. Best Source: (Jenkins and Burkhead, 1975) ANSP 65173-65187.

1930, June 20. SFHR at Bluff City. J.G. Carlson and T. Kerr. Best Source: (Jenkins and Burkhead, 1975) ANSP 65198-65202.

1947, Sept 20. SFHR, mouth of Jacob Creek, elevation 1570 ft, 1.5 miles south VA st line. Reeve M. Bailey, Stroud, Chance, and Gentry.(RMB 47-43B). Best Source: 157510 - 157518, and 183959.

1947, Sept 22. SFHR near mouth of Fish Dam Cr. 2 miles east northeast of south Holston Dam site, elevation 1525. Reeve M. Bailey, Stroud, Chance, and Gentry.(RMB 47-46). Best Source: UMMZ 157529-157554.

1947, Sept 23. SFHR , 0.25 miles above South Holston Dam site, elevation 1490. Reeve M. Bailey, Stroud, Chance, and Gentry.(RMB 47-47). Best Source: UMMZ 157555-157588, and 187237.

1947, Sept 23. SFHR, 1 mile below Virginia line, 1610 ft elevation. R. M. Bailey, R. W. Eschmeyer, J. Chance.(RMB 47-48). Best Source: UMMZ 157589-157619, and 183960.

1949, June 23. SFHR, 500 yards above south Holston Dam, 7 miles southeast of Bristol, Tennessee drainage. R.M. Bailey (RMB 49-11), G.P. Cooper, J.D. Kilby. Best Source: UMMZ 159004 - 159018.

1953, Jan 9 or 29. South Holston Reservoir tailwater, 1 mile downstream of dam. Tennessee Game and Fish Commission.

1953, Nov 13. South Holston Reservoir tailwater, 8 miles downstream of dam at Rock Hole Church. Tennessee Game and Fish Commission.

1955, June 5. South Holston Reservoir tailwater, 0.5 miles downstream of Big Spring and 7 miles downstream of dam. Price Wilkins, Bill Carroll and assistants.

1972, Nov. 11. SFHR about 300 yards above steel bridge at Riverside, and 3.8 air miles east northeast of Bluff City. Noel M. Burkhead (NMB 116), Robert E. Jenkins (REJ 609), M.A. Kuhl, D.R. Robotham.

1973, Aug 22. SFHR in South Holston tailwaters, rkm 79.6. TVA. Best Source: S.A. Ahlstedt, K.T. Henn, and D.M. Hill.

1973, Aug 22. SFHR in South Holston tailwaters, rkm 71.4. TVA. Best Source: S.A. Ahlstedt, K.T. Henn, and D.M. Hill.

1973, Aug 22. SFHR in South Holston tailwaters, rkm 63.1. TVA. Best Source: S.A. Ahlstedt, K.T. Henn, and D.M. Hill.

1992, Mar 9. SFHR at mouth of Dry Creek and at Jct of St Rt 44 (Dry Branch Road) and Chiquapin Grove Road. Sullivan County, Tennessee. M.H. Hughes (MHH 92.29) and P.A. Myer (PAM 61).

1992, Mar 9. SFHR one mile east of mouth of Hatcher Creek off Big Springs Road. Sullivan County, Tennessee. M.H. Hughes (MHH 92.30) and P.A. Myer (PAM 62).

1992, Mar 9. SFHR 100 yards downstream of South Holston Dam. Sullivan County, Tennessee. M.H. Hughes (MHH 92.34) and P.A. Myer (PAM 66).

South Fork Holston River (Main Channel).

38 collections from
Washington County, Virginia.

1947, Sept 20. SFHR 1.8 mi northwest of Damascus at Rt 91 bridge. . Reeve M. Bailey, Chance, Gentry, and Stroud. Best Source: UMMZ 157485 - 157505.

1959, Sept 4. SFHR off rt 91 bridge and 5.8 miles southwest of Lodi. W.R. Taylor (WRT 59-22) and Kanazana. Best Source: USNM-B-114 and USNM 190943.

1964, Sept 8. SFHR 3.0 air miles north of Damascus on rt 91. Royal D. Suttikus (RDS 3581) and Ramsey. Best Source: TU 34566-34589.

1967, July 23. SFHR at rt 724 and 3.2 air miles north of Damascus. Robert F. Donocourt and family (RFD 67-61). Best Source: CU 62786-62792.

1967, July 23. SFHR at rt 91 bridge and 2.1 air miles north northwest of Damascus. Robert F. Denoncourt and family (RFD 67-62). Best Source: CU 52755-52768.

1967, Nov 24. SFHR at rt 91 bridge and 2.9 air miles north northwest of Damascus. Robert F. Denocourt (RFD 67-155), D. C. Wallace, Menzel, D. L. Thomas. Best Source: CU 63505-63518.

1968, June 9. SFHR on county road 731, 1.2 miles southeast of Rt 91 in Lodi. T. Zorach (TZ 214 B), L.P. Jones.

1970. SFHR about 17 river miles above mouth. at junction of SFHR and MFHR. R.E. Wolitz (REW 90).

1970. SFHR above mouth. MFHR. R.E. Wolitz (REW 91).

1970. SFHR ca 0.5 miles below mouth of Laurel Creek. R.E. Wolitz (REW 92).

1970 SFHR 0.7 road miles upstream from Alvarado. David A. Etnier , Tom Alexander, J.H. Pollard, F.L. Oakberg, S.F. Spiller.

1970, June 27. SFHR 0.7 road miles upstream from Alvarado. David A. Etnier and Robert Stiles. Best Source: UTRCF.

1970, Aug 5. SFHR at Alvarado, route 710 bridge, and 5.8 air miles west northwest of Damascus. Robert E. Jenkins (REJ 387) and Tim Zorach (TZ 212).

1971, April 13. SFHR 2 miles north of Damascus on rt 91. Royal D. Suttikus (RDS 4985) and Robert C. Cashner (RCC 71-373). Best Source: TU 69158.

1971, May 18. SFHR at route 91 bridge, and 3.2 air miles northwest of Damascus. Robert E. Jenkins (REJ 466), Noel M. Burkhead (NMB 7), Mark A. Kuhl.

1972, Aug 31. SFHR at rt 710 bridge, and 6.5 miles west northwest Damascus and Alvarado. Noel M. Burkhead (NMB 108), Mark A. Kuhl, Bob Wollitz, and John Jesse.

1972, Aug 31. SFHR at rt 91 bridge, 9.5 air mi south southwest of Glade Spring. Noel M. Burkhead (NMB 109), Mark A. Kuhl, Bob Wollitz, and John Jesse.

1972, Aug 31. SFHR at rt 731 bridge 6 air miles south of Glade Spring. Noel M. Burkhead (NMB 110), Kuhl, Bob Wollitz, and John Jesse.

1972, Aug 31. SFHR on Rt 604 bridge and 5.5 air mi southeast Glade Spring. Noel M. Burkhead (NMB 111), Kuhl, Bob Wollitz, and John Jesse.

1972, Sept 1. SFHR river km 119.7, just off rt 711 and 7.3 air miles southeast of Abingdon , just above Alvarado. Noel M. Burkhead (NMB 114), M.A. Kuhl, R.E. Wollitz, and J. H. Jesse. Best Source: USNM 221794.

1972, Nov. 11. SFHR at rt 711, river mile 74.4 and 7.3 air miles southeast of Abingdon. Robert E. Jenkins (608), Noel M. Burkhead (NMB 115), D.R. Robotham, and M. A. Kuhl.

1973, Sept 9. SFHR river mile 74.4 (= "acuticeps" locality). Robert E. Jenkins (REJ 654), and Noel M. Burkhead (NMB 163).

1973, Sept. 11. SFHR river mile 80.2 at Wright Bridge on Highway 91. 36° 48' 10" N, 81° 46' 55" W. Charlie F. Saylor and TVA crew and Noel M Burkhead (NMB 165) Best Source: (Feeman, 1980).

1973, Aug-Sept. SFHR river mile 97.2 off county road 762 at Love's Mill. 36° 44' 52" N, 81° 40' 55" W. TVA crew. Best Source: (Feeman, 1980).

1980, July 9. SFHR 0.25 miles SW of US Route 91 and 2 miles NW of Damascus. (HOL 80-1). P.E. Stacey, G.D. Constantz, ANSP. Best Source: ANSP 146020-146037.

1983, June 15. SFHR along co rt 711, 5.25 air miles west northwest of Damascus about 0.5 miles southwest Alvarado. (= "acuticeps" locality). Robert E. Jenkins (REJ 981), Noel M. Burkhead (NMB 764), W. H. Haxo (WHH 83), Maulfair (17), McNich (44).

1984, April 24. SFHR co rd 604 bridge and 6.8 air miles southeast of Glade Spring. Robert E. Jenkins (REJ 1079), Noel M. Burkhead (NMB 863), and Haxo (WHH 221).

1984, July 4. SFHR 2.6 miles northwest of junction routes 91 to 58 in Damascus. W. H. Haxo (WHH 303), Kine, Yamaki.

1984, July 4. SFHR at mouth Camel Creek, 3.0 air miles WNW of Damascus. W. H. Haxo (WHH 304), Kine, Yamaki.

1984, July 4. SFHR 3.7 air miles WNW of Damascus left channel at island, 1 first island below US Rt 58 bridge. W. H. Haxo (WHH 305), Kine, Yamaki.

1984, July 4. SFHR 4.1 air miles WNW of Damascus second riffle above county rt 712 bridge. W. H. Haxo (WHH 306), Kine, Yamaki.

1984, July 4. SFHR 4.7 air miles WNW of Damascus. W. H. Haxo (WHH 307), Kine, Yamaki.

1984, July 4. SFHR river mile 74.4, along co rt 711, 5.25 air miles west northwest of Damascus about 0.5 miles southwest Alvarado. (= "acuticeps" locality). W. H. Haxo (WHH 308), Kine, Yamaki.

1984, July 26. SFHR 2.4 air miles northwest of Damascus just off Rt 91 on co rt 723; river mile 81.2.. W. H. Haxo (WHH 310), Kine, Yamaki.

1984, July 26. SFHR 3.75 air miles north of Damascus (rm 83.8) just off co rt 724. W. H. Haxo (WHH 311), Kine, Yamaki.

1984, July 26. SFHR 3.0 air miles north of Damascus (rm 83) at island below co rt 724 bridge. W. H. Haxo (WHH 312), Kine, Yamaki.

1987, Aug 13. SFHR off rt 650, 0.3 km upstream of confluence with Deans Branch. Marion quadrangle. Longitude (813318) and latitude (364549). Best Source: VPI 06010102 031.01.

1988, April 28-29. SFHR river mile 75.4 to 75.3 near Delmar (Damascus Quadrangle, Virginia 213 NE).

South Fork Holston River (Main Channel).
29 collections from
Smyth County, Virginia.

1888, Aug 7. SFHR at Holstein Mills above and below dam. David Starr Jordan. Best Source: USNM 125181, 177838; 67962; and 67974. UMMZ 187290.

1951, June 9. SFHR, 4.4 miles south of Chilhowie on route 79, Tennessee River drainage. E.C. Raney (ECR 51-2041) and C. R. Robins. Best Source: UMMZ 167173, and CU 20951-20959, 25954-25955.

1951, Sept 1. SFHR (South Holston Reservoir). R. G. Martin. (RDR 204). Best Source: (Ross and Carico, 1963).

1951, Sept 1. SFHR (South Holston Reservoir). R. G. Martin. (RDR 289). Best Source: (Ross and Carico, 1963).

1951, Sept 1. SFHR (South Holston Reservoir). R. G. Martin. (RDR 211). Best Source: (Ross and Carico, 1963).

1952, Aug 27. SFHR (South Holston Reservoir). R. G. Martin. (RDR 299). Best Source: (Ross and Carico, 1963).

1952, Aug 28. SFHR (South Holston Reservoir). R. G. Martin. (RDR 287). Best Source: (Ross and Carico, 1963).

1952, Aug 28. SFHR (South Holston Reservoir). R. G. Martin. (RDR 288). Best Source: (Ross and Carico, 1963).

1954, July 31. SFHR 0.8 mile west of Teas, 3 miles west of Sugar Grove. W. Keeton and R.D. Ross (RDR 585). Best Source: (Ross and Carico, 1963).

1954, July 31. SFHR about 1 mile east of Holston Mill, 6 miles from Marion railroad station on azimuth 216°; 3 miles south of McMullin on U.S. Highway 58. W. Keeton and R.D. Ross. (RDR 586). Best Source: (Ross and Carico, 1963).

1954, Aug 11. SFHR 3.3 miles from Chilhowie railroad station on azimuth 144.5° at St Claire Bottom. M.H. Ross and R.D. Ross. (RDR 606). Best Source: (Ross and Carico, 1963).

1954, Aug 11. SFHR 7.2 miles from Marion railroad station on azimuth 230°; 2.1 miles southwest of of Adwolf on Rt 58. M.H. Ross and R.D. Ross. (RDR 607). Best Source: (Ross and Carico, 1963).

1954, Aug 18. SFHR 1.6 miles west of Sugar Grove. M.H. Ross and R.D. Ross. (RDR 608). Best Source: (Ross and Carico, 1963). CU 44448.

1954, Aug 18. SFHR 0.8 mile west of Teas, 3 miles west of Sugar Grove. M.H. Ross and R.D. Ross. (RDR 609). Best Source: (Ross and Carico, 1963).

1954, Aug 24. SFHR on rt 670 just east of junction of rt 650, and west of Teas. Carter R. Gilbert (CRG 8) and E.M. Gilbert. Best Source: UMMZ 169343-169350.

1954, Aug 24. SFHR just off rt 601 at Teas. Carter R. Gilbert (CRG 11) and E.M. Gilbert. Best Source: UMMZ 169364-169371.

1958, July 28. SFHR (South Holston Reservoir), near Wheeler's Dock. R. G. Martin. (RDR 286). Best Source: (Ross and Carico, 1963).

1961, Mar 27. SFHR and 2 mi east of St Clair, rt 657. William P. Davis (WPD 190), Futuyma, Michener. Best Source: CU 37648-37652.

1961, Mar 28. SFHR and 2 miles southeast of Thomas Bridge at rt 650. William P. Davis (WPD 191), Futuyma, Michener. Best Source: CU 37646-37647.

1961, Mar 28. SFHR, 0.75 miles southwest of Thomas Bridge, and one mile west of fish hatchery. William P. Davis (WPD 192), Futuyma, Michener. Best Source: CU 37636-37640.

1973, Aug-Sept. SFHR river mile 108.9 at Buller Bass Hatchery. 36° 45' 40" N, 81° 31' 50" W. TVA crew. (Feeman, 1980).

1976, April 10. SFHR at Teas. Ted Cavender and Marlin Cavender. OSUM 43051 - 43057,

1976, April 10. SFHR at Teas. Ted Cavender and Marlin Cavender. OSUM 43070 - 43077.

1979, March 23. SFHR at co route 601 bridge (upstream) at Teas., 2.2 miles west of Sugar Grove and 5.6 mi southeast of Marion. Craig R. Ciola (C-79-12). OSUM accession no 1979: IV: 10. OSUM 38876 - 38878.

1979, May 25. SFHR at Jct of Co Rts 660 and 645 at bridge, Riverside Baptist Church. W.R. Whitworth (WRW-B-27).

1984, April 24. SFHR at co rt 709 bridge at jct of Co Rds 650 and 709, and 2.2 air miles southwest of Adwolf. Noel M. Burkhead (NMB 862), Robert E. Jenkins (REJ 1078), and W.H. Haxo (WHH 220).

1984, Aug 28. At Buller State Fish Hatchery. Noel M. Burkhead (NMB 917), W.H. Haxo (WHH 317), and P. Calhoun.

1984, Aug 28. SFHR at Buller State Fish Hatchery. Noel M. Burkhead (NMB 918), W.H. Haxo (WHH 318), and P. Calhoun.

1992, Sept 27. SFHR at Co. Hwy. 600/762, South of Chilowie. R.L. Mayden, B.R. Kuhajda, R.M. Wood. Best Source: UAIC 10505.01-10505.10.

Middle Fork Holston River (Main Channel)
19 collections from
Washington County, Virginia.

1885, Aug 11. MFHR at river mile 40. Marshall C. McDonald. (USNM Accession number 16400 and USNM 39530, 39543, 131364 - 131374, 131565 - 131575, 132047 - 132061).

1888, Aug 8. MFHR about 5 miles south of Glade Spring. David Starr Jordan. Best Source: USNM 40560, 40615, 203249, 067963, 067965, 187284, 187283, 067964, 179144, 40357, 40439, 40357, 40542, 040433, and 40595).

1937, June 14. MFHR 8 miles north of Damascus. Leonard P. Schultz and Reid. (*Locality unclear according to REJ either rt 58 or rt 91 bridge*). Best Source: USNM 104082, 109482, 104162, and 104068.

1967, May 13. MFHR just below rt 58 bridge and 6.3 air miles northwest of Damascus. Robert E. Jenkins (REJ 245) and ichthyology class.

1969. MFHR Station 3 about 8.3 mi below Chilhowee. R.E. Wollitz (REW 116).

1969. MFHR Station 4 about 17.7 miles below Chilhowee, and 9.4 miles below station 3. R.E. Wollitz (REW 117).

1972, Sept 1. MFHR at spillway dam at DeBusk Mill just off rt. 736, and 3.4 air miles south of Glade Springs. Noel M. Burkhead (NMB 112), Kuhl, Bob Wollite, and John Jesse.

1972, Sept 1. MFHR at rt 721 ford and 6.0 air miles southwest of Glade Springs. Noel M. Burkhead (NMB 113), Kuhl, Bob Wollite, and John Jesse.

1973, Aug-Sept. MFHR river mile 4.8 at island and 0.2 road mile below Shallow Ford Bridge. 36° 50' 23" N, 81° 53' 35" W. TVA crew. Best Source: (Feeman, 1980).

1984, July 3. MFHR . At Washington/Smyth county line; 1.2 road miles from Chilhowie. W.H. Haxo (WHH 300), Kime, Yamaki.

1984, July 3. MFHR below ford on co rt 707 5.75 air miles east southeast of Abingdon. W.H. Haxo (WHH 301), Kime, Yamaki.

1984, July 3. MFHR at end of co rt 707 at island, 4.2 air miles southeast of Abingdon. W.H. Haxo (WHH 302), Kime, Yamaki.

1986, Jan 6.MFHR along route 736, 6.5 air miles southwest of Chilhowie, river mile 19.6, pool area down from DeBusk Mill Dam. Robert E. Jenkins (REJ 1169).

1986, Jan 6. MFHR at Mock Mill, off co rt 706, and 10 air miles southwest of Chilhowie. Robert E. Jenkins (REJ 1173).

1986. MFHR, river mile 11.7, shoal area and shallow pool about 0.3 miles downstream from unnamed ford near Mock Mill. TVA crew. Best Source: (Saylor et al., 1988).

1986. MFHR, river mile 19.6, pool area down from DeBusk Mill Dam. TVA crew. Best Source: (Saylor et al., 1988).

1988. April 27. MFHR river mile 11.2 to 11.5 and near Mock Hill. (Damascus Quadrangle, Virginia 213 NE). Best Source: (Saylor and Ahlstedt, 1990).

1988. April 28. MFHR river mile 11.2 to 11.5 and near Mock Hill. (Damascus Quadrangle, Virginia 213 NE). (Saylor and Ahlstedt, 1990).

1993, June 17. MFHR 400 meters east of Jct of St Rt 803 and St Rt 706, 600 air meters west of gaging station, and 7.25 air kilometers southwest of De Busk Mill.. D.J. Eisenhour,

M.H. Hughes (MHH 93.59), P.A. Myer (PAM 96). Best Source: UT 44.5959, 44.5961-44.5968, 45.1112, 91.4414-91.4417.

Middle Fork Holston River (Main Channel).
40 collections from
Smyth County, Virginia.

1888, Aug 7. MFHR at Marion, and 0.5 miles above railroad station. David Starr Jordan.

1940, April 1. MFHR, (0.25 miles of stream) 6 miles east northeast of Marion, on route 11 at mouth of Nicks Creek. E.C. Raney (ECR 40-709), E.A. Lachner (EAL 84), and J Kezer. CU Best Source: CU 9938-9951, 22849, 25914, 25915.

1952, June 4. MFHR 15.6 miles southwest of Wytheville on rt 11. R. H. Gibbs (RHG 301) and Caswell. Best Source: CU 21491-21497, 24418.

1952, June 4. MFHR 1.7 mi northeast of Marion on rt 11. R. H. Gibbs (RHG 302) and P.P. Caswell. Best Source: CU 21535-21544.

1952, June 4. MFHR 8.7 miles southwest of Marion on rt 11. R. H. Gibbs (RHG 303) and P.P. Caswell. Best Source: CU 21559-21564, 28494.

1954, July 31. MFHR 0.3 miles west of Sevenmile Ford on Rt 11. W. Keeton and R.D. Ross. (RDR 584). Best Source: (Ross and Carico, 1963). CU 47996.

1954, Aug 11. MFHR at Mt. Zion Church, 4.5 miles from Marion railroad station on azimuth 265°. M.H. Ross and R.D. Ross. (RDR 605). Best Source: (Ross and Carico, 1963). CU 34253, 48000.

1954, Aug 18. MFHR 1 mile west of Marion. M.H. Ross and R.D. Ross. (RDR 610). Best Source: (Ross and Carico, 1963).

1956, Aug 24. MFHR 2.5 miles east of Marion on rt 11 just below Mt. Carmel Church near BM 2208. D. Robinson and R.D. Ross. (RDR 741). Best Source: (Ross and Carico, 1963).

1956, Aug 26. MFHR above Chilhowie, 1 mile below Sevenmile Ford. D. Robinson and R.D. Ross. (RDR 744). Best Source: (Ross and Carico, 1963).

1957, Sept 6. MFHR above Chilhowie, 1 mile below Sevenmile Ford. J.T. Wakeman, I. K. Cook, and R.D. Ross. (RDR 892). Best Source: (Ross and Carico, 1963).

1957, Sept 9. MFHR 0.3 miles west of Sevenmile Ford on Rt 11. J.T. Wakeman, I. K. Cook, and R.D. Ross. (RDR 1026). Best Source: (Ross and Carico, 1963). CU 46173, 48008, 52371, 52372.

1958, July 9. MFHR at co rt 693 and 2 miles north of Marion on rt 11. William S. Woolcott (WSW 61) and University of Richmond class. Best Source: UR 454-467 and UAIC 2570.01-2570.05.

1961, June 9. MFHR at crossing with rt 11, on north corp. limits of Marion. W.J. Richards (WJR 109), G.W. Bane, R. Miller. Best Source: CU 37892-37900..

1961, June 9. MFHR at Sevenmile Ford. W.J. Richards (WJR 110), G.W. Bane, R. Miller. Best Source: CU 38080-38095.

1962, April 2. MFHR at rt 11 bridge north corp limits of Marion. W. J. Richards (WJR 177 or 197), B.B. Collette, and L.W. Knapp (LWK 62-8). Best Source: CU 41840-41847, 42709, 42710, 47909, .

1963, July 9. MFHR 2 miles north of Marion on rt 11 turn onto rt 693. William S. Woolcott (WSW 61) and University of Richmond class. Best Source: UR 1769-1780.

1970, Aug 8. MFHR along side of US Hwy 11, 0.6 mile north of Marion. James D. Williams and William Michael Howell. Best Source: UAIC 3799.01 - 3799.10.

1973, Aug-Sept. MFHR river mile 35.1 off county road 645 5° NE Of BMZ 375. 36° 49' 08" N, 81° 36' 30" W. TVA crew. Best Source: (Feeman, 1980).

1973, Aug-Sept. MFHR river mile 50.2 off county road 622, 0.2 river miles above the mouth of Bear Creek. 36° 52' 02" N, 81° 26' 32" W. TVA crew. Best Source: (Feeman, 1980).

1973, Oct 6. MFHR 100 yards downstream from 11 bridge at east end of Marion. James R. Reed (JRR 1002=246) and Virginia Commonwealth University class.

1976, April 11. MFHR at Marion. T.M. Cavender and Marlin Cavender. OSU 43025-43026.

1976, May 1. MFHR east edge of Marion at rt 11 bridge. Robert E. Jenkins (REJ 736) and J. A. Musick (76-07).

1979, May 25. MFHR in Marion across from Ray's Kingburgers (at Rt 11 Bridge). Walter R. Whitworth (WRW-B-28).

1983, June 14. MFHR at rt 11 bridge above at Eastern limits of Marion. Noel M. Burkhead (NMB 762), Robert E. Jenkins (979), W.H. Haxo (WHH 81), SPM (42), and MDM (15).

1984, Feb 19. MFHR at the uppermost st rt 11 bridge in Marion. Noel M. Burkhead (NMB 836) and W. H. Haxo (194).

1984, March 17. MFHR off co rt 693, 100 meters north of junction co rt 693-and US rt 11, just northeast of Marion. Robert E. Jenkins (REJ 1054), Noel M. Burkhead (NMB 842), W. H. Haxo (200).

1984, March 17. MFHR along rt 645 at Jct of co roads 644-645 and 4.4 air miles west of center of Marion. Robert E. Jenkins (REJ 1055), Noel M. Burkhead (NMB 843), W.H. Haxo (201).

1984, April 24. MFHR at rt 11 bridge and 3.2 air miles east northeast of Atkins. Robert E. Jenkins (REJ 1077), Noel M. Burkhead (NMB 861), W.H. Haxo (219).

1984, June 4. MFHR at rt 11 bridge east edge of Marion. Robert E. Jenkins (1096), Noel M. Burkhead (881), W.H. Haxo (254).

1984, July 3. MFHR at junction of co rts 644 and 645; 4.2 air miles west of Marion. W.H. Haxo (WHH 299), Kimi, G. Yamaki.

1984, July 3. MFHR at Smyth/Washington county line. W.H. Haxo (WHH 300), Kimi, G. Yamaki.

1985, Jan 27. MFHR and spring at east end of Marion off st rt 11. Robert E. Jenkins (REJ 1137), Noel M. Burkhead (930), and W.H. Haxo (WHH 328).

1985, Dec 17. MFHR and spring at east end of Marion off st rt 11. Robert E. Jenkins, and Noel M. Burkhead (953).

1985, Dec 17. MFHR along rt 645 at Jct of co roads 644-645 and 4.4 air miles west of center of Marion. Robert E. Jenkins (REJ 1168), and Noel M. Burkhead (NMB 954).

1986. MFHR, river mile 37.0, Glen Gardner's farm. Two deep pools just downstream from rapids. TVA crew. Best Source: (Saylor et al., 1990).

1993, June 17. MFHR off US Hwy 11, 0.1 km upstream of Dry Run Creek, 4.3 air km west of Bland County line, and 1.5 air km from west limit of Groseclose Airstrip. D.J. Eisenhower, M.H. Hughes (MHH 93.55), P.A. Myer (PAM 92). Best Source: UT 44.5953, 44.5954, 45.1112.

1993, June 17. MFHR at mouth of Nicks Creek in Atkins. D.J. Eisenhower, M.H. Hughes (MHH 93.56), P.A. Myer (PAM 93). Best Source: UT 44.5955-44.5957, 91.4413-91.4415.

1993, June 17. MFHR at railroad crossing off St Rt 693 in Marion. D.J. Eisenhower, M.H. Hughes (MHH 93.57), P.A. Myer (PAM 94). Best Source: UT 91.4413.

1993, June 17. MFHR at Sevenmile Ford and off st rt 645 next to Norfolk Railroad crossing and one hundred yards north of I-81 and US Hwy 11. D.J. Eisenhower, M.H. Hughes (MHH 93.58), P.A. Myer (PAM 95). Best Source: UT 44.5956, 44.5958-44.5960, 44.5967, 90.1542, 91.4414-91.4416.

Watauga River (Main Channel).
14 collections from
Carter County, Tennessee

1888, Aug 11. WR at Elizabethton. C.H. Bollman and B.W. Evermann and Jordan, Jenkins, and Meek. Best Source: UMMZ 187259, 187288 187289, 192567,

1937, Oct 8. Watauga River. At Elizabethton, Tn at Highway 37 bridge. A. R. Cahn (TVA 37 341). Best Source: UMMZ 130820-130831.

1947, Sept 18. WR, just below Fish Spring, 2.7 miles east of Watauga River dam site. Reeve M. Bailey (RMB 47-37), Stroud, Chance, and Gentry.

1953, Feb 10. Wilbur Lake tailwaters, 3/4 mile downstream of dam at Bee Cliff. Tennessee Game and Fish Commission..

1973, June 15. Watauga River below dam at Elizabethton. Carter County, Tennessee. F. Oakberg, D.A. Etnier.

1978, April 15. Watauga River below Watauga Lake at Rt 91 bridge, 3.0 air miles east center Elizabethton. Carter County, Tennessee. Beets, Brown, Williams, N.M. Burkhead (NMB 441)

1978, June 20. Watauga River ca. 2 miles below Washington-Carter county line, off unnumbered st rt. Best Source: Beets, N.M. Burkhead (NMB 459), Harris.

1988, June 7. Watauga River (rivermile 19.4) on lefthand side of an island, approximately 1.1 mi. downstream of Smalling Bridge. (TWRA Site 1) Carter County, Tennessee. L. Price Wilkins, Rick D. Bivens, and Chester J. Ellison.

1988, June 7. Watauga River (rivermile 19.5) about 0.1 mile upstream from TWRA Site 1 (TWRA Site 2). Carter County, Tennessee. L. Price Wilkins, Rick D. Bivens, and Chester J. Ellison.

1988, June 7. Watauga River Just downstream of Smalling Bridge at rivermile 20.05 (TWRA Site 3). Carter County, Tennessee. L. Price Wilkins, Rick D. Bivens, and Chester J. Ellison.

1988, June 7. Watauga River (rivermile 20.8) at pipeline crossing river upstream from Smalling Bridge (TWRA Site 4). Carter County, Tennessee. L. Price Wilkins, Rick D. Bivens, and Chester J. Ellison.

1988, May 18-19. Watauga River upstream and downstream from Elizabethton. Carter County, Tennessee. TVA IBI Site. Best Source: UT 2.171-173, 29.109, 44.4786-4788, 45.853-855.

1988, June 8. Watauga River (rivermile 31.2) Upstream of Elizabethton at the head of Wagner Island (TWRA Site 5). Carter County, Tennessee. L. Price Wilkins, Rick D. Bivens, and Chester J. Ellison.

1991, Aug 15. WR off Blevins Road 0.2 miles northeast of Hwy 67. Carter County, Tennessee. David J. Eisenhour, Lynn V. Eisenhour, Mark H. Hughes (MHH 91.17), and Pat A. Myer. Best Source: UTRCF 44.5376, 44.5377, 91.4043.

Watauga River (Main Channel).
4 collections from
Johnson County, Tennessee

1947, Sept 19. Watauga River, 4.5 miles SE Butler (before flooding) 1.5 miles above NC line, elev. 1940 ft. R.M. Bailey (RMB 47-41) Stroud, Chance, and Gentry. Best Source: UMMZ

1973, June 16. Watauga River at old road access between NC state line and Watauga reservoir. Johnson County, Tennessee. F.V. Oakburg, D.A. Etnier.

1977, Sept 24. Watauga River at end of unnamed st rt off rt 321, ca 1.5 stream miles below Tennessee/North Carolina state line, 14.6 air miles SSW center of Mountain City. Noel M. Burkhead (NMB 376), Jim Beets, Dave Nieland.

1977, June 22. Watauga River at Arizona: Trevor Road at island. Noel M. Burkhead (NMB 467), Jim Beets, John Harris.

Watauga River (Main Channel).
14 collections from
Watauga County, North Carolina.

1941, Aug 20. WR, 2 miles below Cove Creek. J.R. Bailey. Best Source: William M. Palmer at North Carolina State Museum of Natural Science.

1941 Aug 20. Watauga River at Hwy 105. Watauga County, North Carolina. Best Source: William M. Palmer at North Carolina State Museum of Natural Science.

1964, Mar 27. WR about 2 miles northeast of Hwy 105 of Watauga-Avery county line, on private road, mail box name was Arvilia Hodges. C.C. Swift (CCS 64-24), Brockelman, and Futuyma.

1964, Mar 27. WR, 1.25 miles upstream from crossing of hwy 105, and about 0.25 miles upstream from junction with co rd 1568. C.C. Swift (CCS 64-25) , Brockelman, and Futuyma. Best Source: UMMZ 183657-183667.

1964, Mar 27. WR, at crossing of hwy 105 and 194. C.C. Swift (CCS 64-26) , Brockelman, and Futuyma. Best Source: UMMZ 183668-183675.

1964, Mar 27. WR, at entrance of Cove Creek, and crossing of old NC road 603 (=co rd 1121).. C.C. Swift (CCS 64-27) , Brockelman, and Futuyma. UMMZ 183678-183682.

1972, Dec 23. Watauga River at NC 94 on Co Rd 1116, 0.8 mile NW of Valle Crucis. L.R. Goodman and P.H. Goodman. Best Source: UTRCF Misc. Fish Collections # 705 in file 396-748.

1972, Dec 30. Watauga River at NC 94 on Co Rd 1116, 2.1 miles NW of Valle Crucis. L.R. Goodman and P.H. Goodman. Best Source: UTRCF Misc. Fish Collections # 705 in file 396-748.

1976, Sept 25. Watauga River at County Rd. 1201; and 4.1 miles NW of Rominger. (Wat-33). E.F. Menhinick and Ichthyology Class. Best Source: E.F. Menhinick.

1977, July 30. Watauga River 0.2 miles below NC 194; and 1.0 mile NW of Valle Crucis. E.F. Menhinick, Varick, Staley, et al.

1985, Sept 28. Watauga River above NC Hwy 321, 4.5 mi W of Sherwood. Avery County, North Carolina. E.F. Menhinick & Limnology class. Best Source: UAIC 9506.01-9506.09.

1988, May 4. WR at river mile 61.9 - 62.3. at US Hwy 321 and west of Sugar Grove (Sherwood Quadrangle, North Carolina, 214 SE). Best Source:

1991, Aug 31. WR at crossing nearest the state line. Watauga County, North Carolina. David J. Eisenhour, Lynn V. Eisenhour, David A. Etnier (DAE 91.46), Liz Etnier, M.A,

Etnier, M.H. Hughes (MHH 91.21A), P.A. Myer. Best Source: UT 44.5475-44.5479, 48.740, 90.1343, 91.4106, 91.4107.

1991, Aug 31. WR at US Hwy 321. Watauga County, North Carolina. David J. Eisenhour, Lynn V. Eisenhour, David A. Etnier, Liz Etnier, M.A, Etnier, M.H. Hughes (MHH 91.21B), P.A. Myer. UT 44.5476-44.5477,

Miscellaneous Collections

Holston River at HRM 0-52.5

1968, April 8. Holston River, one mile above Three Rivers Boat Dock (HRM 1). Knox County, Tennessee. D. Bishop and Sewell, Tennessee Game and Fish Commission. Best Source: UT 45.299 (originally UT 45.46).

Beaver Creek

1953, Jan 17. Beaver Creek 0.25 mile below Beaver Creek Baptist Church. Jefferson County, Tennessee. W.S. Woolcott (WSW 2362). CU 25614-25621.

1953, April 19. Beaver Creek, 8 miles south of Jefferson City on old US HWY 11E turn west 1.6 miles. Jefferson County, Tennessee. W.S. Woolcott (WSW 2371). Best Source: CU 25725-25732.

1964, Mar 1. Beaver Creek under Hwy 11E. Jefferson County, Tennessee. T.A. Fincher (TAF 006). Best Source: CU 54799.

Buffalo Springs

1952, Oct 2. Buffalo Creek at old mill 12.1 miles from Carson-Newman College. Grainger County, Tennessee. W.S. Woolcott (WSW 2354), Max Bohner. Best Source: CU 23296-23300.

1952, Nov 8. Buffalo Springs at mouth in Tempis and 12.1 miles from Carson-Newman College.. Grainger County, Tennessee. W.S. Woolcott (WSW 2357), Max Bohner. Best Source: CU 23303-23306.

1953, April 16. Buffalo Springs at Spring proper about 12.5 miles from Carson-Newman College. Grainger County, Tennessee. W.S. Woolcott (WSW 2358). Best Source: CU 25529-25531..

1953, April 16. Buffalo Springs 12.5 miles west of Carson Newman College at Jefferson City. Grainger County, Tennessee. W.S. Woolcott (WSW 2372). Best Source: CU 25529-25531.

1990, Aug 24. Buffalo Springs downstream from Buffalo Springs Hatchery. At junction of Buffalo Springs Road and Owl Road. At bridge and waterfall (Above and below falls). Grainger County, Tennessee. David J. Eisenhour, M.H. Hughes (MHH 90.35), and P.A. Myer. Best Source: UT 31.132, 44.5229, 44.5230, 45.923, 61.97, 91.3959, 129.350.

Flat Creek

1976, June 17. Flat Creek 1 mile north of Mascot. Knox County, Tennessee. D.G. Buth, B.M. Burr, L.M. Page. Best Source: INHS 75138-75143.

1990, Aug 31. Flat Creek at Washington Pike and Idumea Road. Knox County, Tennessee. David J. Eisenhour, M.H. Hughes (MHH 90.37), and P.A. Myer. Best Source: UT 44.5079-44.5084, 45.898, 91.3887-91.3889.

1991, Mar 20. Flat Creek below confluence with Little Flat Creek off Idumea Road at northeast base of House Mountain. David A. Eisenhour, Lynn V. Eisenhour, Mark H. Hughes (MHH 91.01). Best Source: UT 44.5269-44.5272, 45.956, 91.3981-91.3984.

1991, Mar 20. Flat Creek at junction of Corryton Road and Jack Road about 3 miles southwest of Lutrell. Union County, Tennessee. David A. Eisenhour, Lynn V. Eisenhour, Mark H. Hughes (MHH 91.02). Best Source: UT 44.5082, 91.3985-91.3987, 129.352.

1991, Mar 20. Brice Branch trib to Flat Creek off Idumea Road and 0.25 miles north of 11W. Knox County, Tennessee. David A. Eisenhour, Lynn V. Eisenhour, Mark H. Hughes (MHH 91.03). Best Source: UT 44.1548, 44.5266-44.5268.

1991, Sept 11. Little Flat Creek at intersection of Jim Wolfe Road and Emory Road at the railroad trestle. Knox Count, Tennessee. M.H. Hughes (MHH 91.30), and P.A. Myer. Best Source: UT 44.5270, 44.5081, 44.5272, 91.3981, 91.3985, 129.373.

1992, Sept. Flat Creek below confluence with Little Flat Creek off Idumea Road at northeast base of House Mountain. David A. Eisenhour and Mark H. Hughes (MHH 92.55A).

1992, Sept. Flat Creek at Washington Pike and Idumea Road. Knox County, Tennessee. David J. Eisenhour, M.H. Hughes (MHH 92.55B).

Legg Creek

1991, Aug 22. Legg Creek at Knoxville Utilities Board substation at Ellistown and US Hwy 11W. Knox County, Tennessee. David J. Eisenhour, Lynn V. Eisenhour, Mark H. Hughes. (MHH 91.22).

Lost Creek

1952, Sept 20. Lost Creek (Sinking Creek) 1.5 miles from Jefferson City. Jefferson County, Tennessee. Max Bohner, W.S. Woolcott (WSW 2352). Best Source: CU 23287-23289.

1953, April 24. Lost Creek, 1 mile east of New Market. Jefferson County, Tennessee. W.S. Woolcott (2374). Best Source: CU 23404.

1953, Aug 19. Lost Creek , 2.7 miles southeast of Jefferson City on secondary road. Jefferson County, Tennessee. C.R. Robins (CRR TN-7) and W.S. Woocott. Best Source: CU 25941-25943.

Mill Spring

1941, Sept 18. Mill Spring Branch, tributary to the Holston River. Tarzwell, Smith, and White (TVA 1941 S-82). Grainger County, Tennessee. (Bean Station, TN 162 SW). UMMZ 221857-221875.

1952, Oct 23. Mill Springs where it joins the Holston River 5.1 miles from Carson-Newman College. Jefferson County, Tennessee. W.S. Woolcott (WSW 2356B). Best Source: CU 23302, 44521-44523,

1953, Jan 17. Mill Spring 5.1 mi west of Jefferson City. Jefferson County, Tennessee. W.S. Woolcott (WSW 2361). Best Source: CU 25622-25625.

1953, Feb 21. Mill Spring at mouth at Holston River. 5.1 miles west of Jefferson City. Jefferson County, Tennessee. W.S. Woolcott (WSW 2367). Best Source: CU 25532-25536.

Richland Creek

1991, Sept 11. Avondale Springs trib to Richland Creek off of Poor Valley Road at 90 degree bend in the road 1.5 kilometers north of US 11W and at Avondale. Grainger County, Tennessee. Mark H. Hughes (MHH 91.27), and P.A. Myer.

1990, Aug 31. Richland Creek at Ferrell Road Bridge. 3 miles northeast of Blane. Just off Hwy 11W. Grainger County, Tennessee. David J. Eisenhour, M.H. Hughes (MHH 90.36), and P.A. Myer. Best Source: UT 91.3923, 91.3924.

1991, Sept 11. Richland Creek at Bluff Road and Owl Gap Road 0.25 miles south of 11W. Mark H. Hughes (MHH 91.29), and P.A. Myer. Best Source: UT 90.1336, 91.3924, 129.373.

1991, Sept 11. Unnamed tributary to Richland Creek. off Poor Valley Road. 3.75 km northeast of center of Rutledge and 2 km southwest of firetower on Clinch Mountain. Grainger County, Tennessee. M.H. Hughes (MHH 91.28), P.A. Myer.

Roseberry Creek

1990, Aug 31. Roseberry Creek 100 yards west of Rutledge Pike (11W) out Trout Road. Knox County, Tennessee. David J. Eisenhour, M.H. Hughes (MHH 90.38), and P.A. Myer. Best Source: UT 44.5117-44.5121, 45.905, 90.1255-90.1257, 91.3908-91.3911, 129.343.

Swanpond Creek

1991, Aug 16. Swanpond Creek at Kennedy Road. Knox County, Tennessee. David J. Eisenhour, Lynn V. Eisenhour, Mark H. Hughes. Best Source: UT 44.5469, 61.1029, 90.1339, 91.4099-91.4100,

1992, May 23. Swanpond Creek between Strawberry Plains Pike and Holston River Road. Knox County, Tennessee. David J. Eisenhour, Steve Fraley, M.H. Hughes (MHH 92.43).

1994, July 21. Swanpond Creek at Kennedy Road. Knox County, Tennessee. M.H. Hughes, L.G. Hughes, S.H. Hughes, L.G. Hughes, and R.F. Hughes.

HRM 52.5-111

Black Oak Branch

1941, Sept 10. Black Oak Branch just above mouth at Holston River. Tarzwell, Smith, and White (TVA 1941 S-50). Jefferson County, Tennessee. (Talbot, Tn 163-NW, 1940). Best Source: UMMZ 221299-221318.

1941, Sept 10. Byrd's Spring Brook, trib to Mossy Creek, just above mouth. Tarzwell, Smith, and White (TVA 1941 S-52). Jefferson County, Tennessee. (Joppa, Tn 155-NE, 1939). *Specimens at UMMZ but not catalogued.*

Caney Creek

1941, Sept 16. Caney Creek at U.S. Hwy 11 bridge. Tarzwell, Smith, and White (TVA 1941 S-76). Hawkins County, Tennessee. (171 NE). Best Source: UMMZ 221720-221742.

Cedar Creek

1941, Sept 13. Cedar Creek, trib to the Holston River, at mouth. Tarzwell, Smith, and White (TVA 1941 S-64). Hamblen County, Tennessee. (Russelville, Tn 171 SW). Best Source: UMMZ 221608-221624.

Cloud Creek

1941, Sept 16. Cloud Creek, tributary to Holston River, at U.S. Hwy 11W bridge. Tarzwell, Smith, and White (TVA 1941 S-77). Hawkins County, Tennessee. (171 NE). Best Source: UMMZ 221743-221763.

Crockett Creek

1941, Sept 16. Crockett Creek about 2.25 miles above mouth. Tarzwell, Smith, and White (TVA 1941 S-75). Hawkins County, Tennessee. (171 NE). Best Source: UMMZ 221710-221719.

Dodsons Creek

1941, Sept 15. Dodson's Creek, trib to Holston River, at highway bridge about 0.5 mi above mouth. Tarzwell, Smith, and White (TVA 1941 S-72). Hawkins County, Tennessee. (McCloud, Tn 180 SW). Best Source: UMMZ 221650-221671.

1990, April 14. Dodson Creek, lower section of creek about 1 kilometer above mouth at intersection of TN Hwy 70 and Dru Hanes Road. Hawkins County, Tennessee. D.A. Etnier (DAE 90.6), M.H. Hughes (MHH 90.22), S.R. Layman. Best Source: UT 44.4883-44.4885

Fall Creek

1941, Sept 13. Fall Creek, trib to Holston River, 0.5 mi above mouth. Tarzwell, Smith, and White (TVA 1941 S-65). Hamblen County, Tennessee. (Russelville, Tn 171 SW). Best Source: UMMZ 222480-222493.

German Creek

1941, Sept 17. Briar Fork and German Creek at junction. Tarzwell, Smith, and White (TVA 1941 S-80). Grainger County, Tennessee. (Bean Station, TN 162 SW). Best Source: UMMZ 221809-221828.

1941, Sept 17. Ray Creek at junction with German Creek. Tarzwell, Smith, and White (TVA 1941 S-81). Grainger County, Tennessee. (Bean Station, TN 162 SW). Best Source: UMMZ 221830-221856.

1991, Sept 11. Shields Creek at source tributary to Ray Creek and German Creek. Grainger County, Tennessee. M.H. Hughes (MHH 91.26), P.A. Myer.

Honeycutt Creek

1941, Sept 15. Honeycut Creek, trib to Holston River, at mouth from highway bridge down toward river. Tarzwell, Smith, and White (TVA 1941 S-71). Hawkins County, Tennessee. (Bulls Gap, Tn 171 SE). Best Source: UMMZ 221638-221649.

Hall Branch

1941, Sept 10. Hall Branch at spring, trib to Holston River, Tarzwell, Smith, and White (TVA 1941 S-53). Hamblen County, Tennessee. (Talbott, Tn 163-NW, 1940). Best Source: UMMZ 221333-221334.

Kellar Branch

1941, Sept 13. Kellar Branch 0.5 mi above mouth, trib to Holston River. Tarzwell, Smith, and White (TVA 1941 S-66). Hamblen County, Tennessee. (Russelville, Tn 171 SW). Best Source: UMMZ 221625-221635, 222785.

Mossy Creek

1941, Sept 10. Mossy Creek 2 mile above mouth. Tarzwell, Smith, and White (TVA 1941 S-51). Jefferson County, Tennessee. (Joppa, Tn 155-NE, 1939). Best Source: UMMZ 221319-221326.

1952, Feb 19. Mossy Creek, 0.5 miles northeast of Carson-Newman College campus. Jefferson County, Tennessee. W.S. Woolcott (WSW 2365). Best Source: CU 24624-24626, 47881.

1952, Sept 9. Mossy Creek at Jefferson City Waterworks. Jefferson County, Tennessee. W.S. Woolcott (WSW 2351). Best Source: CU 23282-23286.

1953, April 23. Mossy Creek at the Jefferson City waterworks. Jefferson County, Tennessee. W.S. Woolcott (WSW 2373). Best Source: CU 44528-44529.

1953, April 28. Mossy Creek at the Jefferson City waterworks. Jefferson County, Tennessee. W.S. Woolcott (WSW 2375), Worley, Peoples, Ratcliff. Best Source: CU 24443, 25537-25539, 25712.

1953, May 14. Mossy Creek at the Jefferson City waterworks. Jefferson County, Tennessee. W.S. Woolcott (WSW 2380), F. Worley, V. Jenkins. Best Source: CU 24443, 25537-25539, 25712.

1970, Aug 7. Mossy Creek at US 11E in Jefferson City at the water works. Jefferson County, Tennessee. W.M. Howell, J.D. Williams.

Needmore Creek

1941, Sept 13. Needmore Creek at mouth and lower 150 yards. Tarzwell, Smith, and White (TVA 1941 S-67). Hamblen County, Tennessee. (Russelville, Tn 171 SW).

Noe Creek

1941, Sept 11. Noe Creek, trib to the Holston River, at mouth and upstream 100 yards. Tarzwell, Smith, and White (TVA 1941 S-58). Hamblen County, Tennessee. (Avondale, Tn 162 SW, 1938).

Panther Creek

1941, Sept 10. Panther Creek, trib to Holston River, just above mouth and below lowest highway crossing. Tarzwell, Smith, and White (TVA 1941 S-54). Hamblen County, Tennessee. (Talbott, Tn 163-NW, 1940).

1941, Sept 11. Busby Creek trib to Panther Creek, at Lawrence Mill, main stream and spring. Tarzwell, Smith, and White (TVA 1941 S-55). Hamblen County, Tennessee. (Talbott, Tn 163-NW, 1940). Best Source: UMMZ 222434-222437.

1941, Sept 11. Panther Creek, trib to Holston River, at second road crossing upstream. Tarzwell, Smith, and White (TVA 1941 S-56). Hamblen County, Tennessee. (Talbott, Tn 163-NW, 1940).

1941, Sept 11. Panther Creek, spring at headwaters. Tarzwell, Smith, and White (TVA 1941 S-57). Hamblen County, Tennessee. (Talbott, Tn 163-NW, 1940).

1952, Sept 25.. Panther Springs, trib to Panther Creek, 7.9 miles north of Jefferson City on US 11E. Jefferson County, Tennessee. Best Source: CU 24445-24447, 44476-44478..

1953, Feb 21. Panther Springs, trib to Panther Creek, 7 miles north of Jefferson City on Route 11 east (A sign indicates *Spring*). Jefferson County, Tennessee. Best Source: CU 23417-23419.

Poor Valley Creek

1941, Sept 17. Poor Valley Creek at Highway bridge on U.S. 11W. Tarzwell, Smith, and White (TVA 1941 S-79). Hawkins County, Tennessee. (Russellville, TN 171 SW).

1987, Aug 25. Poor Valley Creek at Spruce Pine Church, 1.8 air miles northeast of St Hwy 31 and east of Flat Gap Road. Elevation 1085'. Hawkins Co., Tennessee. Rick D. Bivens, Chester J. Ellison, and Wayne Schacher.

1987, Aug 25. Poor Valley Creek just below the third road bridge up on Poor Valley Road above Cherokee Reservoir. Hawkins Co., Tennessee. Rick D. Bivens, Chester J. Ellison, and Wayne Schacher.

1991, Nov 13. Poor Valley Creek at Spruce Pine Church, 1.8 air miles northeast of St Hwy 31 and east of Flat Gap Road. Elevation 1085'. Hawkins Co., Tennessee. M.H. Hughes (MHH 91.46) and Patrick A. Myer. UT 44.5488, 90.1342, and 91.4101-91.4105.

1991, Nov 13. Heck Branch 100 yards from its confluence with Poor Valley Creek and from East Poor Valley Road and off of Heck Branch Road. Hawkins Co., Tennessee. M.H. Hughes (MHH 91.47) and Patrick A. Myer. UT 90.1345 and 91.4103.

1991, Nov 13. Poor Valley Creek at East Poor Valley Road and St Hwy 66. Hawkins Co., Tennessee. M.H. Hughes (MHH 91.48) and Patrick A. Myer. UT 44.5480-44.5484, 48.741, 90.1342, 90.1344, 91.4101, 91.4102, 91.4103,

1991, Nov 13. Little Poor Valley Creek at state hwy 94 crossing. Hawkins Co., Tennessee. M.H. Hughes (MHH 91.49) and Patrick A. Myer. UT 44.5481, 44.5489, and 90.1345.

Red House Branch

1941, Sept 17. Red House Branch, tributary to the Holston River, just above U.S. 11W bridge. Tarzwell, Smith, and White (TVA 1941 S-78). Hawkins County, Tennessee. (Russellville, TN 171 NE).

Robertson Creek

1941, Sept 14. Robertson Creek at lowest highway x-ing near mill. Tarzwell, White, and Mahoney (TVA 1941 S-70). Hamblen County, Tennessee. (Bulls Gap, Tn 171 SE). Best Source: UMMZ 221636-221637. *other specimens at UMMZ not catalogued.*

Spring Creek

1941, Sept 12. Spring Branch trib to Holston River where road crosses not far from Rock of Ages School. Tarzwell, Smith, and White (TVA 1941 S-59). Hamblen County, Tennessee. (Avondale, Tn 162 SW, 1938). Best Source: UMMZ 222474.

1941, Sept 13. Spring Creek at mouth, trib to Holston River. Tarzwell, Smith, and White (TVA 1941 S-63). Hamblen County, Tennessee. (Bean Station, Tn 162 SE). Best Source: UMMZ 221587-221607.

1941, Sept 13. Stubblefield Branch, trib to Spring Creek. Tarzwell, Smith, and White (TVA 1941 S-62). Hamblen County, Tennessee. (Morristown, Tn 163 NE). Best Source: 221578-221586.

Turkey Creek

1941, Sept 12. Havley Spring Branch near jct with Turkey Creek. Tarzwell, Smith and White. (TVA 1941 S-60). Hamblen County, Tennessee. (Morristown, Tn 163 NE). Best Source: UMMZ 222475-222479.

1941, Sept 12. Turkey Creek, lower 100 yards. Tarzwell, Smith, and White (TVA 1941 S-61). Hamblen County, Tennessee. (Bean Station, Tn 162 SE). Best Source: UMMZ 169542-169565, 222861-222864.

War Creek

1941, Sept 14. War Creek at mouth of Holston River. Tarzwell, White, and Mahoney. (TVA 1941 S-69). Hawkins County, Tennessee. (Bulls Gap, Tn 171 SE).

HRM 111-126.

Beech Creek

1941, Sept 15. Beech Creek at Highway running up Webster Valley. Tarzwell, Smith, and White (TVA 1941 S-73). Hawkins County, Tennessee. (Burem, Tn 180 NW). Best Source: UMMZ 221672-221684.

1990, April 14. Beech Creek trib to Holston River, 0.8 mile north of Webster Valley Road off Tunnel Hill Road. 6.5 miles southeast of Rogersville. Hawkins County, Tennessee. D.A. Etnier, Steve R. Laymen, M.H. Hughes (MHH 90.23). Best Source: UT 44.4799-44.4810.

1990, June 13. Beech Creek at river mile 7 and 0.5 mile upstream from Keplar School. Hawkins County, Tennessee. Rick D. Bivens, Mark T. Fagg, Mark H. Hughes, and Carl E. Williams.

Big Creek

1941, Sept 15. Big Creek trib to Holston River at lowest highway bridge at mouth of Amis Branch. Tarzwell, Smith, and White (TVA 1941 S-74). Hawkins County, Tennessee. (Burem, Tn 180 NW). Best Source: UMMZ 221685-221709.

1990, August 24. Big Creek at Blevins Road and 0.4 miles north of Junction with Hwy 11W. Hawkins County, Tennessee. David J. Eisenhour, Mark H. Hughes (MHH 90.30), and P.A. Myer. Best Source: UT 44.4964-44.4968,

1990, August 24. Big Creek off West Bear Hollow Road at gaging station. 3 air miles NEE of Rogersville. Hawkins County, Tennessee. David J. Eisenhour, Mark H. Hughes (MHH 90.32), and P.A. Myer. Best Source: UT 44.4964-44.4967, 44.4969, 44.4971, 44.4975, 45.885, 91.3813, 91.3814, 129.330.

Surgoinsville Creek

1975, November 30. Surgoinsville Creek 1.2 miles north of Surgoinsville (US11W) W.C. Starnes, Louton, Betson, Burkhead.

Terril Creek

1975, November 30. Terrill Creek 1.7 miles south of Surgoinsville (US11W) W.C. Starnes, Louton, Betson, Burkhead.

NFHR in Scott County, Virginia.

1977, Aug 22. NFHR at Freeman Island (river mi 13.4) off st rt 778 and 0.3 rd mi east of Jct st rt 614 and st rt 778. Scott County, Virginia. J.C. Feeman and TVA crew. Best Source: Thomas McDonough, TVA, Knoxville, Tn (Hill et al, 1980). Best Source: UT 44.4269. [Note: This collection was not used in compilation of tables, but is reported because of catalogued specimen].

Big Moccasin Creek

1954, July 18. Big Moccasin Creek, trib to NFHR, 2.6 miles north of Hilton. Scott County, Virginia. R.D. Ross (RDR 0574) and W. Keaton. Best Source: CU 34254.

Possum Creek

1970, Oct 10. Possum Creek at Rt 713 bridge south of Cleveland School. Scott County, Virginia. R.D. Ross and M.T. Masnik. Best Source: CU 68500.

NFHR in Washington County, VA.

1982, May 20. NFHR at Hobbs Ford, Rm 42.5-42.7 and 1 air mi ENE Mendota. Robert E. Jenkins (950), Haxo (57), and McIninch (11). Best Source: Robert E. Jenkins (Roanoke College).

1982, May 20. NFHR at Fleenor Mill Ford, RM 44.6. Robert E. Jenkins (951), Haxo (58), and McIninch (12). Best Source: Robert E. Jenkins (Roanoke College).

1982, May 20. NFHR off St Rt 802 and 0.3 air mi southwest of Roebuck and 2.5 rd mi south of Jct of county rd 802 and US Hwy 19 at Hines Island (river mile 56.3). (TVA site and RDR site). Robert E. Jenkins (952), Haxo (59), and McIninch (13). Best Source: Robert E. Jenkins (Roanoke College).

1993, June 27. NFHR at mouth of Wolf Creek and 100 meters downstream from Hayters Gap. Tracy Hartman, P.A. Myer (PAM 109). Best Source: UT 44.5982-44.5985, 48.798, 91.4423-91.4425.

Big Tumbling Creek

1954, Aug 6. Tumbling Creek (trib of NFHR) at mouth. R.D. Ross (RDR 0592), L.M. Smith, and J. Cooper. Best Source: CU 34258.

1969-1972. Big Tumbling Creek, impounded as Laurel Bed Lake, in the ENE corner of Russell County, Virginia. R.E. Wolitz (REW 89).

1972. Big Tumbling Creek ca 0.5 stream miles below Laurel Bed Lake Dam. Russell County, Virginia. R.E. Wolitz (REW 103).

1993, June 27. Big Tumbling Creek trib to the NFHR 600 meters upstream from the mouth. Washington County, Virginia. Tracy Hartman and P.A. Myer (PAM 107). Best Source: UT 44.5982, 45.1114, 91.4430, 91.4434,

NFHR in Smyth County, VA.

1973, April 14. NFHR 10 rd mi north of Hungry Mother State Park at St Rt 16 N bridge. James E. Johnson and University of Massachusetts class. (JEJ 20). Best Source: Robert E. Jenkins (Roanoke College).

1986, April 19. NFHR Rt 630 bridge and 2.5 air mi east of Broadford. Robert E. Jenkins, Des Fosse, Munroe, and VIMS class. Best Source: Robert E. Jenkins (Roanoke College).

1987, July 27. NFHR 0.5 km downstream of Smyth/Bland county line. Nebo Quadrangle (longitude 812410 and latitude 365809). Best Source : VIMS 06010101 013.00.

1993, June 27. NFHR at St Rt 62 bridge at Chatham Hill. Tracy Hartman, P.A. Myer (PAM 100). Best Source: UT 44.5980, 44.5987, 91.4432.

1993, June 27. NFHR at Jct of St Rts 91 and 42 at Broadford. Tracy Hartman, P.A. Myer (PAM 102). Best Source: UT 44.5979-44.5981, 48.798, 91.4424, 91.4430.

1993, June 27. NFHR off St Rt 91 and 1.25 air km northeast of Watsons Gap and North Holston; and 2.5 air km west of Broadford. Tracy Hartman, P.A. Myer (PAM 103). Best Source: UT 48.798, 91.4424, 91.4429-91.4430.

Laurel Creek

1951, June 8. Laurel Creek (per R.E. Jenkins) 3.5 miles southwest of Tannersville on Rt. 91 at Smith/Tazwell county line. Virginia. E.C. Raney (ECR 2038) and C.R. Robins. Best Source: CU 20925-20934.

1954, May 20. Laurel Creek, trib to NFHR, just below Tazwell/Smyth County line. Virginia. R.D. Ross (RDR 0668), and F. Burleson. CU 51656, 51657.

1954, July 17. Laurel Creek, trib of NFHR, 0.5 mi north of Broadford. R.D. Ross (RDR 0567) and W. Keaton. Best Source: CU 28333, 28334.

1993, June 30. Laurel Creek at Little Tumbling Creek, trib to the NFHR, Tazewell County, Virginia. P.A. Myer (PAM 122). Best Source: UT 44.5990, 91.4424.

Lick Creek

1973, Aug 22. Lick Creek just above first rt 625 bridge, 1.9 air miles north of Ceres. Bland County, Virginia. M.E. Seehorn (MES 23).

1973, Aug 22. Lick Creek, trib to NFHR, off st rt 625, ca 0.75 stream miles above the first 625 bridge. Bland County, Virginia. M.E. Seehorn (MES 24).

1993, June 26. Lick Creek trib to NFHR off st rt 621 at first bridge crossing north of St Hwy 42. At gap in Carter Mountain. Smyth County, Virginia. P.A. Myer (PAM 99). Best Source: UT 44.5983, 44.5988, 48.798, 91.4433.

Locust Cove Creek

1993, June 27. Locust Cove Creek, trib to the NFHR, off st rt 42; 0.5 km south of st rt 628; and 5 air km west of Chatham Hill. Smyth County, Virginia. Tracy Hartman, P.A. Myer (PAM 101). Best Source: UT 44.5981, 44.5983, 44.5986.

SFHR in Sullivan County, Tennessee.

1951, Aug 29. SFHR. Possibly the Lucy Branch. Collected by Chance, Hasl, Monges. Best Source: UT 44.294.

1961, July 13. Pickens Bend area in Sullivan County, Tennessee. *This locality is near the border of Washington/Sullivan counties at the site of Boone Dam.* Best Source: UT 44.284.

1962, June 17. South Holston Reservoir, Holston Valley. B. Carroll, W.M. Turner, and R. Hoffarth.

1962, July 17. South Holston reservoir. Sullivan County, Tennessee. TVA crew. Best Source: UT 44.250.

1962, July 24. South Holston reservoir, TVA collection area # 2. Sullivan County, Tennessee. TVA crew. Best Source: UT 44.250.

1966, July 24. Fort Patrick Henry Lake. Sullivan County, Tennessee. Barrigar and Barrigar. Best Source: UT 44.11.

1984, Sept 5. Boone Reservoir, SFHR mile 28.4. D.E. Lane. Best Source: TWRA 8.16, 8.17, 8.18, 8.19, 18.16,

1985, July 25. Boone Reservoir at Dam. D.E. Lane. Best Source: TWRA 8.28,

1985, Sept 5. South Holston Reservoir at Big Jacob Creek embayment. TWRA crew. Best Source: TWRA 8.32, 8.33, 11.73, 11.74, 11.75, 11.76, 15.8, 18.42, 20.1,

1986, Aug 21. South Holston reservoir. TWRA. Best Source: TWRA 15.12, 15.13,

1987, Sept 3. Boone Reservoir, SFHR mile 28.4. TWRA. Best Source: TWRA 11.291, 11.292, 11.293,

1991, Oct 15. Boone Reservoir, SFHR mile 19.8. TVA crew.

1991, Oct 16. Boone Reservoir, SFHR mile 27.0. TVA crew.

1991, Oct 22. South Holston Reservoir, SFHR mile 62.0 TVA crew.

1991, Oct 23. South Holston Reservoir, SFHR mile 52.0 TVA crew.

Beaver Creek

1973, February 22. Beaver Creek at Milligan College near Elizabethton. Carter County, Tennessee. Winfield, Oakberg, D.A. Etnier.

1978, June 20. Beaver Creek on US Hwy 37 at Thomas Bridge. Sullivan County, Tennessee. Beets, N.M. Burkhead (NMB 461), John Harris.

1992, Feb 8. Beaver Creek on US Hwy 37 at Thomas Bridge. Sullivan County, Tennessee. M.H. Hughes (MHH 92.16), P.A. Myer (PAM 42).

Beldemon Creek

1992, Mar 9. Beldemon Creek off bridge at Jct of Beldemon Creek Road and Emmett Road Sullivan County, Tennessee. M.H. Hughes (MHH 92.33), P.A. Myer (PAM 65).

Bristol Caverns

1947, Nov 1. Bristol (stream) about 5 miles east of Bristol on rt 241 (South Fork Holston River). Sullivan County, Tennessee. E.E. Brown (EEB 47-46). Best Source: CU 11600.

Hatcher Creek

1992, Mar 9. Hatcher Creek trib to SFHR off Big Springs Road at second bridge above mouth and 0.25 miles northeast of st rt 44. Sullivan County, Tennessee. M.H. Hughes (MHH 92.31), P.A. Myer (PAM 63).

Horse Creek

1961, June 8. Horse Creek on Rt 81 2.5 miles south of traffic light in Sullivan County, Tennessee. W.J. Richards, R. Miller, G.W. Bane. Best Source: CU 38075.

1977, Sept 9. Horse Creek at unnamed st rt bridge at Sullivan Gardens. Beets, Heacock, and N.M. Burkhead (NMB 363).

1992, Sept 13. Walker Fork, trib to Horse Creek, at Murrell Road, 6.0 airmiles southwest of Kingsport. Sullivan County, Tennessee. P.A. Myer (PAM 78). Best Source: UT 44.5602, 44.5604,

1992, Sept 13. Horse Creek at TN 93, 4.8 air miles SSW of Kingsport. Sullivan County, Tennessee. P.A. Myer (PAM 79). Best Source: UT 44.5602, 44.5604,

1992, Sept 13. Horse Creek at Russell Chapel Road, 3.3 air miles SSE of Kingsport. Sullivan County, Tennessee. P.A. Myer (PAM 80). Best Source: UT 44.5602, 44.5604.

Indian Creek

1940, July 19. Indian Creek, trib to SFHR, south of Bluff City. Sullivan County, Tennessee. Station number 63, collection number M39-625. Peyton and Chance. Tn Dept of Conservation. Best Source: UMMZ 201910, 201911.

Kendrick Creek

1940, July 12. Kendrick Creek, trib to SFHR, at Fordstown. Station number 51, collection number M39-621. Peyton and Chance. Tn Dept of Conservation. Best Source: 201905, 201906.

1940, July 12. Kendrick Creek, trib to SFHR, 5 miles southeast of Kingsport. Station number 52, collection number M39-626. Peyton and Chance. Tn Dept of Conservation.

1978, June 20. Kendrick Creek, trib to SFHR, off unnumbered co rt, 5.8 air miles WNW Boone Reservoir Dam. Sullivan County, Tennessee. Beets, N.M. Burkhead (NMB 460), John Harris.

Possum Creek

1992, Mar 9. Possum Creek at St Rt 44 in Cedar Grove. Sullivan County, Tennessee. M.H. Hughes (MHH 92.32), P.A. Myer (PAM 64).

Reedy Creek

1977, Sept 9. Reedy Creek at st rt 2851 in city limits of Kingsport. Sullivan County, Tennessee. Beets, Heacock, N.M. Burkhead (NMB 364). Best Source: UT 44.1500-44.1501.

1992, Feb 8. Reedy Creek trib to SFHR at Baneroft Chapel Road next to TN scale Company, 100 yards from 11W. Sullivan County, Tennessee. M.H. Hughes (MHH 92.13), P.A. Myer (PAM 39).

1992, Feb 8. Reedy Creek trib to SFHR at Harrtown Road and Market Street just south of US 11W. Sullivan County, Tennessee. M.H. Hughes (MHH 92.14), P.A. Myer (PAM 40).

1992, Feb 8. Reedy Creek trib to SFHR at Central Heights Road and US 11 W, 0.35 miles south of HWy 37.. Sullivan County, Tennessee. M.H. Hughes (MHH 92.15), P.A. Myer (PAM 41).

Sinking Creek

1940, July 12. Sinking Creek near Fordtown. Station number 50. Sullivan County, Tennessee. Peyton and Chance. Tn Dept of Conservation. Best Source: UMMZ 201912, 201913.

1968, June 3. Watauga River at rt 194 bridge, 2.5 miles south of junction of routes 194 and 421. T. Zorach (TZ 189) and L. P. Jones. Best Source: CU 53823-53828.

1978, June 20. Sinking Creek, trib to SFHR, at unnamed co rt bridge, 7.1 air miles ENE center of Bluff City, 4.8 air miles southeast center of Bristol. Beets, N.M. Burkhead (NMB 462), Harris. Best Source: UT 44.1698.

1992, Feb 8. Unnamed trib to Boone Lake at Church Hill Road and Devault Bridge Road Sullivan County, Tennessee. M.H. Hughes (MHH 92.17), P.A. Myer (PAM 43).

SFHR in Washington County, Virginia

1961, Mar 28. SFHR, one mile south of Damascus on Virginia 91, at Laurel Creek. W.P. Davis (WPD 193), Futuyma, and Michener. Best Source: CU 37630, 37702-37711, 38197, and 38510.

1976, June 11. SFHR just above Alvarado (= "acuticeps" locality). R.E. Jenkins (REJ 749) and D. J. Jenkins.

1977, April 23. SFHR at 712 bridge and 3.9 air miles west northwest of the center of Damascus, and 1 air miles upstream (southeast) of Alvarado. Robert E. Jenkins (782-B), J. A. Musick (77-03) and class.

1965, June 17-27. SFHR (HOL 65-1) about 2 miles northwest of Damascus and 0.25 miles southwest of Rt 58 bridge. Best Source: ANSP 110717-110736.

1986, Jan 6. SFHR off co rt 711 and 3.25 air miles west northwest of Damascus. Robert E. Jenkins (REJ 1170).

1986, Jan 6. SFHR along rt 711 at rm 74.4 and 7.3 air mi southeast of Abingdon. Robert E. Jenkins (REJ 1171).

1986, Jan 6. SFHR about 0.25 miles above route 91 bridge, and 2.3 air miles north northwest of center of Damascus. Robert E. Jenkins (REJ 1172).

1987, Oct 28. SFHR 1.5 miles downstream from confluence with Middle Fork Holston River. Abingdon quadrangle. Longitude (815535) and latitude (363842). Best Source: VPI 06010102 020.01.

1992, Sept 26. SFHR along Virginia Hwy 711, 1 mi NW of Del Mar, just above confluence with Rockhouse Creek. R.L. Mayden, B.K. Kuhajda, R.M. Wood. Best Source: UAIC 10600.01-10600.03

Laurel Creek

1940, June 20. Laurel Creek, trib to SFHR, north of Mountain City. Johnson County, Tennessee. Station number 11. Collection number M39-606. Peyton and Chance. Tn Dept of Conservation. Best Source: UMMZ 201890, 201891.

1940, June 20. Laurel Creek, trib to SFHR, at Bloomery and north of Mountain City. Johnson County, Tennessee. Station number 11. Collection number M39-608. Peyton and Chance. Tn Dept of Conservation. Best Source: UMMZ 201888, 201889.

1947, Nov 2. Laurel Creek, trib to SFHR, about 2 miles south of Damascus on Rt 91 just north of NC state line. E.E. Brown (EEB 47-48). Best Source: CU 19177-19183.

1978, June 22. Laurel Creek, trib to SFHR, just off st rt 91, 5.2 air miles north center Mountain City. Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 468), John Harris.

1978, June 22. Laurel Creek, trib to SFHR, just off st rt 91, 8.4 air miles north northwest center Mountain City. Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 469), John Harris.

1940, June 15. Beaverdam Creek, trib to Laurel Creek, Shady Valley. Johnson County, Tennessee. Station number 1. Collection number M39-600. Peyton and Chance. Tn Dept of Conservation. Best Source: UMMZ 201883.

1940, June 15. Beaverdam Creek, trib to Laurel Creek, Shady Valley. Johnson County, Tennessee. Station number 2. Collection number M39-601. Peyton and Chance. Tn Dept of Conservation. Best Source: UMMZ 201884, 201885.

1940, June 15. Beaverdam Creek, trib to Laurel Creek, Shady Valley. Johnson County, Tennessee. Station number 6. Collection number M39-603. Peyton and Chance. Tn Dept of Conservation. Best Source: UMMZ 201886.

1940, June 24. Beaverdam Creek, trib to Laurel Creek, south of Damascus about 2300 ft Johnson County, Tennessee. Station number 20. Collection Number M39-610. Peyton and Chance. Tn Dept of Conservation. Best Source: UMMZ 201892.

1940, June 24. Beaverdam Creek, trib to Laurel Creek, south of Damascus about 2300 ft Johnson County, Tennessee. Station number 21. Collection Number M39-611. Peyton and Chance. Tn Dept of Conservation. Best Source: UMMZ 201893, 201894.

1973, February 22. Beaverdam Creek at Rock underpass of TN 133. Johnson County, Tennessee. Winfield, Oakberg, D.A. Etnier.

1978, June 21. Beaverdam Creek on US 421 and 34 bridge, 7.5 air miles WNW center Mountain City. Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 465), John Harris.

1978, June 21. Beaverdam Creek at mouth of Fagall Branch and 7.2 air miles NW center Mountain City. Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 466), John Harris.

1981, Sept 15. Beaverdam Creek at Backbone Creek. off St Hwy 133. Johnson County, Tennessee. David A. Etnier (DAE 81-24). Best Source: UT 44.2410-44.2417, 45.388, 91.2267-91.2269, 129.149, 129.150.

1982, June 24. Beaverdam Creek at Backbone Creek. off St Hwy 133. Johnson County, Tennessee. W.C. Dickinson, D. Eason, C.E. Louton, J.A. Louton (JAL 82-40), and D. Wilson. Best Source: UT 44.2689-44.2693, 91.2450, 91.2451, 129.149.

1991, June 28. Beaverdam Creek trib to Laurel Creek then SFHR Off St Hwy 133. Seven miles north of Shady Valley and the Junction of US Hwy 421. Johnson County, Tennessee. David J. Eisenhour (DJE 91.06), Lynn.V. Eisenhour, Lisa G. Hughes, Mark.H. Hughes (MHH 91.12). Best Source: UT 91.2267, 91.4016, 129.360.

1991, Nov 2. Beaverdam Creek off U.S. 421 and 0.3 miles northwest of intersection with U.S. 91. Johnson County, Tennessee. Patrick.A. Myer (PAM 1), Tracey. J. Hartman. Best Source: UT 44.5454.

1991, Nov 2. Beaverdam Creek at intersection of U.S. 133 and Winchester Road. Johnson County, Tennessee. Patrick.A. Myer, Tracey. J. Hartman. Best Source: UT 44.5454.

Whitetop Laurel Creek

1970, June 11. Whitetop Laurel Creek, trib to Laurel Creek, at first railroad crossing above confluence with Straight Branch. Washington County, Virginia. M.E. Seehorn (MES 5).

1970, June 11. Whitetop Laurel Creek, trib to Laurel Creek, at Taylor's Valley. Washington County, Virginia. M.E. Seehorn (MES 6).

1970, June 11. Whitetop Laurel Creek, trib to Laurel Creek, 0.5 mile below Green Cove Creek. Washington County, Virginia. M.E. Seehorn (MES 7).

1952, June 5. Unnamed trib to Laurel Creek, 1.5 miles south of Damascus, Virginia. on Back Bone Park Road. Johnson County, Tennessee. R.H. Gibbs (RHG 304), P.P. Caswell. Best Source: CU 21511-21519.

1952, June 5. Unnamed trib to Laurel Creek, 6.5 miles south of Damascus, Virginia. on Back Bone Park Road. Johnson County, Tennessee. R.H. Gibbs (RHG 305), P.P. Caswell. Best Source: CU 21554-21558..

SFHR in Smyth County, Virginia.

Dickey's Creek

1940, April 1. Dickey's Creek, a trib to the SFHR, on rt 88, 4 miles north of Troutville, Virginia. Smyth County, Virginia. E.A. Lachner and E.C. Raney. Best Source: CU 9928-9932.

MFHR in Washington County, Virginia.

Byer Creek

1990, May 14. Byer Creek, trib to the MFHR, 0.5 miles upstream from mouth, and 11.8 air miles ENE of Abingdon. Washington County, Virginia. TVA crew. Best Source: UT 44.5702-44.5705.

Unnamed Tributary

1951, June 9. Unnamed trib to the MFHR 3.3 miles southwest of Chilhowie on US 11. E.C. Raney and C.R. Robins (ECR 2040). Washington County, Virginia. Best Source: CU 25952, 20668-20672.

MFHR in Smyth Co, Virginia.

1938, Oct 25. MFHR out of Marion. Earl M. Cady and TVA (TVA 1032). Best Source: UMMZ 129090-129098.

1956, Mar 12. MFHR about 4 miles northeast of Marion on US 11, Holston-Tennessee drainage. H. E. Winn (HEW 56-10), Hardy, and Picciolo. Best Source: UMMZ 171340-171355.

1969. MFHR just above Chilhowie (rm 28.5) R. E. Wollitz (REW 115).

1973. MFHR at city limits of Marion on rt 11 (Note: REJ chose this to be east limit as opposed to west) James E. Johnson (JEJ 25) and University of Massachusetts class. Best Source: Robert E. Jenkins, Roanoke College.

1986, Jan 6. MFHR at De Busk Mill along route 736, and 6.5 air miles southwest of Chilhowie. Robert E. Jenkins (REJ 1169).

1986. MFHR, river mile 32.2, deep pool impounded by low dam at Highway 11 bridge near Seven Mile ford. TVA crew. Best Source: (TVA, 1988).

1987. MFHR, river mile 54.0. TVA crew. Best Source: (Saylor et al., 1990).

Bear Creek

1938, Oct 25. Bear Creek, trib to MFHR, Smyth County, Virginia. Earl R. Cady.(TVA 1035). Best Source: UMMZ 129099-120107.

1976, April 11. Bear Creek, trib of MFHR, above Marion. Smyth County, Virginia. Ted Cavender and Marlin Cavender.

1976, June 15. Bear Creek, trib to the MFHR, ca 1 mile above the mouth of Bear Creek at the old ford. Smyth County, Virginia. E.L. Cooper (ELC-B-1679) and R.E. Strauss (RES 2) and (RES 45-46).

1990, May 15. Bear Creek, trib to MFHR, at 2nd bridge above mouth, off county rd. 617 (?), and 5.0 air miles northeast of Marion. Smyth County, Virginia. TVA crew. Best Source: UT 44.5784, 44.5786,

Hungry Mother Creek

1940, Oct 27. Hungry Mother Creek, at Hungry Mother State Park. Smyth County, Virginia. E.R. Cady (TVA 1038). Best Source: UMMZ 129108-129117.

1971, April 15. Hungry Mother Creek, 2.3 miles west of US 11 and VA 16.junction in Hungry Mother State Park. Smyth County, Virginia. H.T. Boschung, M.F. Mettee, G. Beckman, P. Mundy.

1940, April 1. Unnamed trib to the MFHR, 1 mile north of Chilhowie. E.A. Lachner and E.C. Raney (ECR 0711).Best Source: CU 9952-9962, 28495.

Watauga River in Washington County

1978, June 20. Watauga River ca. 2 river miles below Washington-Carter County line, off unnumbered st rt. Beets, N.M. Burkhead (NMB 459), John Harris.

1991, Oct 17. Boone Reservoir, WRM 8.3. Sullivan/Washington counties. TVA crew.

Boone Creek

1978, May 20. Boone Creek, trib to SFHR, at unnamed county road bridge, 5.7 air miles NNW of center of Johnson City. Washington County, Virginia. Beets, N.M. Burkhead (NMB 458), John Harris.

Cobb Creek

1940, July 22. Cobb Creek, trib to Watauga River, northwest of Johnson City. Station number 66. Peyton and Chance. Tennessee Department of Conservation.

Watauga River in Carter County, Tennessee.

1947, Sept 19. WR, 4.5 miles southeast of Butler (before flooding), 1.5 miles above North Carolina, elevation 1940 ft. Reeve M. Bailey (RMB 47-41), Stroud, Chance, and Gentry.. Best Source: UMMZ 157472 - 157484, and 183965.

1949, Sept 7. Watauga Lake at Piercetown. Carter County, Tennessee. Eastwood, Eschmeyer, Hassler, Yambert. Best Source: CU 24006.

1950, Aug 27. Watauga Lake at Piercetown. Carter County, Tennessee. W.W. Hassler (WWH 50Aug27). Best Source: CU 24000, 55808..

1958, Aug 1. Watauga reservoir in Carter County, Tennessee. *No collectors given.* Best Source: UT 44.325.

1961, July 11-14. Watauga reservoir in Carter County, Tennessee. *No collectors given.* Best Source: UT 44.325.

Buffalo Creek

1940, July 22. Buffalo Creek, trib to Watauga River, between Johnson City and Elizabethton. Carter County, Tennessee. Station number 64. Peyton and Chance. Tennessee Department of Conservation.

1978, April 2. Buffalo Creek at bridge on st rt 67, 4.2 air miles southwest of center of Elizabethton. Beets and C. Hamilton.

1978, April 15. Buffalo Creek off rt 67A at unnamed co rt bridge. Carter County, Tennessee. Beets, Brown, Williams, N.M. Burkhead (NMB 440)

1992, Feb 8. Buffalo Creek in Marbleton off St Hwy 107 0.25 rd miles north of intersection with Barnett Rd. Unicoi County, Tennessee. M.H. Hughes (MHH 92.18), P.A. Myer (PAM 44). Best Source: University of Tennessee Zooarchaeology Osteological Collection.

1992, Feb 8. Buffalo Creek off St Hwy 359 0.25 rd miles south of jct with Anderson Road. Unicoi County, Tennessee. M.H. Hughes (MHH 92.19), P.A. Myer (PAM 45).

Doe River

1953, Aug 29. Doe River 2.7 miles south of Elizabethton off US Hwy 19E. Carter County, Tennessee. R.H. Gibbs (RHG 420) and Caswell.

1969, August 13. Doe River at Elizabethton. Carter County, Tennessee. Warrington, Carter, Winfield, Rice, D.A. Etnier.

1977, Sept 25. Doe River just off rt 37, just above Hampton at confluence of Little Doe River and Doe River. Carter County, Tennessee. Beets, Neiland, N.M. Burkhead (NMB 381).

1978, April 2. Doe River on right side of island above bridge on st rt 67 and Jct of co rt 2515 in Elizabethton. Carter County, Tennessee. Beets and C. Hamilton.

1978, April 13. Doe River just off rt 37, 3.8 air miles SSE center of Hampton. Carter County, Tennessee. Beets, Brown, Williams, N.M. Burkhead (NMB 433)

1978, April 13. Doe River at rt 143 bridge, 2.6 air miles SSW Roan Mountain (City). Carter County, Tennessee. Beets, Brown, Williams, N.M. Burkhead (NMB 435)

1984, Aug 7. Doe River Station # 4, off Siam Road off US Hwy 19E, just out of Elizabethton. Carter County, Tennessee. Richard Kirk. Best Source: UT 44.3169, 44.3173,

1988, May 16-17. Doe River at DRM 1, TVA IBI Site. Carter County, Tennessee. C.F. Saylor and TVA crew. Best Source: UT 44.4790-44.4791, 44.4793, 44.4794,

1991, Aug 15. Doe River at Hwy 19E. Carter County, Tennessee. David J. Eisenhour, Lynn V. Eisenhour, Mark H. Hughes (MHH 91.15), and Lisa G. Hughes.

Elk River.

1940, June 25. Elk River, south of Elk Mill, trib to Watauga River. TVA Quad 214 SW. Station number 27. Carter County, Tennessee. Peyton, Chance (TDC 40-27), Tn Dept of Conservation. Best Source: UMMZ 201861-201864.

1941, Aug 22. Elk River, one mile below Banner Elk. Avery County, North Carolina. Joe Bailey. Best Source: William M. Palmer at North Carolina State Museum of Natural Science.

1941, Aug 22. Elk River below Little Elk River. Avery County, North Carolina. Best Source: William M. Palmer at North Carolina State Museum of Natural Science.

1947, Sept 18. Elk River trib to Watauga River 2.5 miles south of Butler (before flooding) at lower Elk River school, elevation 1910 ft. 36° 18' N, and 81° 59' 55" W. Carter County, Tennessee. Reeve M. Bailey, Stroud, Chance, and Gentry.

1969, August 27. Elk River 1.3 miles south of Elk Mills. Carter County, Tennessee. Warrington, Carter, Rice, D.A. Etnier.

1977, Feb 27. Elk River, trib to the Watauga, at 2nd bridge on st rt 2520, 10.2 air miles east of the center of Hampton. Carter County, Tennessee. J.P. Beets, D. Neiland, N.M. Burkhead (NMB 299).

1977, April 16. Elk River, trib to the Watauga, at 2nd bridge on st rt 2520, 10.2 air miles east of the center of Hampton. Carter County, Tennessee. J.P. Beets, C.E. Heacock, N.M. Burkhead (NMB 308). Best Source: UT 44.1724.

1977, April 30. Elk River, trib to the Watauga, at 2nd bridge on st rt 2520, 10.2 air miles east of the center of Hampton. Carter County, Tennessee. Nieland, Ryon, Turner, Wunderland, Hamilton, Beets.

1977, May 8. Elk River above Watauga Reservoir. Carter County, Tennessee. J.P. Beets, N.M. Burkhead, Charles Pittenger. Best Source: UT 44.2919.

1977, May 15. Elk River, trib to the Watauga, at 2nd bridge on st rt 2520, 10.2 air miles east of the center of Hampton. Carter County, Tennessee. Beets and Heacock..

1977, Sept 10. Elk River, trib to the Watauga, just above Watauga Lake. Carter County, Tennessee. Beets, N.M. Burkhead (NMB 372), and Heacock..

1977, Sept 24. Elk River, trib to the Watauga, just above Watauga Lake. Carter County, Tennessee. N.M. Burkhead (NMB 377), Beets, and Nieland. Best Source: UT 44.1728.

1977, Oct 8. Elk River, trib to the Watauga, just above Watauga Lake. Carter County, Tennessee. N.M. Burkhead (NMB 390), Beets, C. Hamilton.

1977, Nov 13. Elk River, trib to the Watauga, just above Watauga Lake. Carter County, Tennessee. N.M. Burkhead (NMB 406), Beets, Peterson.

1978, Jan 28. Elk River, trib to the Watauga, at second bridge upstream from Watauga Lake. Carter County, Tennessee. N.M. Burkhead (NMB 409), Beets, Ryon.

1978, Feb 25. Elk River, trib to the Watauga, just above Watauga Lake. N.M. Burkhead (NMB 415), Beets, Kauffman.

1978, Mar 11. Elk River, trib to the Watauga, just above Watauga Lake. Carter County, Tennessee. N.M. Burkhead (NMB 420), Beets, Peterson, Legler.

1978, April 14. Elk River, trib to the Watauga, just above Watauga Lake. Carter County, Tennessee. Paul Brown, N.M. Burkhead (NMB 436), Cindy Williams. Best Source: UT 44.1712, 44.2950-44.2951.

1978, June 30. Elk River, trib to the Watauga, just above Watauga Lake. Carter County, Tennessee. N.M. Burkhead (NMB 477), Beets, Hamilton.

Sinking Creek

1991, Nov 17. Sinking Creek at cave where creek disappears off Sinking Creek Rd on Dale Cannon property. M.H. Hughes (91.53) and Kyle Cannon.

Stony Creek

1940, June 21. Stony Creek, trib to Watauga River, station number 14 northeast of Elizabethton. Carter County, Tennessee. Peyton and Chance. Tn Dept of Conservation.

1940, June 21. Stony Creek, trib to Watauga River, station number 15 approximately 2300 ft elevation. Buladeen to Sadie. Carter County, Tennessee. Peyton and Chance. Tn Dept of Conservation. Best Source: UMMZ 201944.

1940, June 21. Stony Creek, trib to Watauga River, station number 17 Elizabethton. Carter County, Tennessee. Peyton and Chance. Tn Dept of Conservation. Best Source: UMMZ 201939, 201940.

1978, June 21. Stony Creek, trib to Watauga, ca 0.25 miles above confluence with the Watauga River just off st rt 91. Carter County, Tennessee. Beets, N.M. Burkhead (NMB 463), John Harris.

1978, June 21. Stony Creek, trib to Watauga, bridge in Carter, 9.0 air miles northeast center Elizabethton. Tennessee. Beets, N.M. Burkhead (NMB 464), John Harris.

1991, June 28. Stony Creek trib to the Watauga River about 17 road miles north of the Watauga River bridge. one mile north of Hold Road. Carter County, Tennessee. David J. Eisenhour, Lynn V. Eisenhour, Lisa G. Hughes, and M.H. Hughes (MHH 91.13). Best Source: UT 44.5356, 44.5357, 91.4017, and 129.358.

1991, June 28. Stony Creek at confluence with the Watauga River. David J. Eisenhour, Lynn V. Eisenhour, Lisa G. Hughes, and M.H. Hughes. Best Source: UT 44.5372, 91.4026, 129.359.

1991, Nov. 16. Stony Creek at junction of Blue Springs Road and St Rt. 91. Carter County, Tennessee. T. Hartman, M.H. Hughes (MHH 91.50), L.G. Hughes, P.A. Myer (PAM 12).

1991, Nov. 16. Stony Creek at junction of Peters Hollow Road and St Rt. 91. Carter County, Tennessee. T. Hartman, M.H. Hughes (MHH 91.51), L.G. Hughes, P.A. Myer (PAM 13).

1991, Nov. 16. Stony Creek at junction of Blevins Road and St Rt. 91. Carter County, Tennessee. T. Hartman, M.H. Hughes (MHH 91.52), L.G. Hughes, P.A. Myer (PAM 14).

Watauga River in Johnson County

Doe Creek

1940, June 22. Doe Creek, trib to Roan Creek, southwest of Mountain City. Johnson County, Tennessee. Station number 22. Peyton and Chance. Tn Dept of Conservation. Best Source: UMMZ 201860.

1969, August 13. Doe Creek 0.7 miles northwest of Hampton at Tennessee Hwy 37. Carter County, Tennessee. Warrington, Carter, Winfield, Rice, D.A. Etnier.

1973, June 15. Doe Creek just below Doeville. Johnson County, Tennessee. D.A. Etnier and F.V. Oakberg.

1977, Feb 27. Doe Creek off co rt 2374, 0.7 rd miles NE of Junction of Rt 2576-2374. Johnson County, Tennessee. N.M. Burkhead (NMB 300), J. Beets, D. Neiland.

1977, April 20. Doe Creek at mouth of unnamed branch on unnumbered County Route off Rt 2374, 1.5 air miles northwest of confluence of Doe and Roan creeks. Johnson County, Tennessee. J.P. Beets, Nieland, Ryon, Turner. Best Source: UT 91.1736.

1977, April 23. Doe Creek off County Route off Rt 2374, 1.5 air miles northwest of confluence of Doe and Roan creeks. Johnson County, Tennessee. N.M. Burkhead (NMB 313), J. Beets, Nieland, C. Stansbury, C. Halmiton. Best Source: UT 44.3294.

1977, April 23. Doe Creek off co rt 2374, 0.8 rd miles NE of Junction of Rt 2576-2374. Johnson County, Tennessee. N.M. Burkhead (NMB 314), J. Beets, C. Stansbury, C. Halmiton.

1977, April 30. Doe Creek below last TWRA dam. Johnson County, Tennessee. Beets, Nieland, Ryon, Turner, Wunderlund.

1977, April 30. Doe Creek at mouth of unnamed branch on unnumbered County Route off Rt 2374, 1.5 air miles northwest of confluence of Doe and Roan creeks. Johnson County, Tennessee. Beets, Nieland, Ryon, Turner, Wunderlund.

1977, Sept 10. Doe Creek off rt 2374, ca 1.5 stream miles above Watauga Lake. Johnson County, Tennessee. N.M. Burkhead (NMB 369), J. Beets, Heacock.

1977, Sept 25. Doe Creek off rt 2374, at Doeville. Johnson County, Tennessee N.M. Burkhead (NMB 379), J. Beets, D. Neiland.

1977, Sept 25. Doe Creek off co rt 2374, 0.7 rd miles NE of Junction of Rt 2576-2374. Johnson County, Tennessee. N.M. Burkhead (NMB 380), J. Beets, D. Neiland.

1977, Oct 8. Doe Creek off co rt 2374, 0.7 rd miles NE of Junction of Rt 2576-2374. Johnson County, Tennessee. N.M. Burkhead (NMB 392), J. Beets, C. Halmiton.

1977, Nov 12. Doe Creek at 2374 bridge at Junction of Rt 67-2374. Johnson County, Tennessee. N.M. Burkhead (NMB 404), Beets, Scott, McKinney.

1978, Jan 28. Doe Creek at 2374 bridge at Junction of Rt 67-2374. Johnson County, Tennessee. N.M. Burkhead (NMB 411), Beets, Ryon.

1978, Feb 25. Doe Creek off co rt 2374, 1.5 stream miles above Watauga Lake. Johnson County, Tennessee. N.M. Burkhead (NMB 416), J. Beets, G. Kaufman.

1978, Mar 11. Doe Creek at 2374 bridge at Junction of Rt 67-2374. Johnson County, Tennessee. N.M. Burkhead (NMB 422), Beets, D. Peterson..

1978, April 15. Doe Creek off co rt 2374, 1.5 stream miles above Watauga Lake. Johnson County, Tennessee. N.M. Burkhead (NMB 438), J. Beets, Brown, Williams, Peterson.

Roan Creek

1940, June 21. Forge Creek, trib to Roan Creek, east of Shouns station. Station number 18. Johnson County, Tennessee. Peyton and Chance. Tn Dept of Conservation.

1940, June 24. Town Creek, trib to Roan Creek, at Shouns. Johnson County, Tennessee. Station number 25. Peyton and Chance. Tn Dept of Conservation.

1973, June 15. Roan Creek just above Watauga reservoir. Johnson County, Tennessee. F. Oakberg and D.A. Etnier.

1973, June 15. Roan Creek along county road 2374 about 4 miles above mouth. Johnson County, Tennessee. F. Oakberg and D.A. Etnier.

1977, Feb 27. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, Neiland, N.M. Burkhead (NMB 301).

1977, April 16. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 309), C. Heacock.

1977, April 16. Roan Creek, trib to Watauga, at lower falls off rt 34-421, 2.9 air miles southeast center of Mountain City. Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 310), C. Heacock.

1977, April 16. Roan Creek at rt 2461 bridge, 9.4 air miles SSW center of Mountain City. Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 311), C. Heacock. Best Source: UT 44.1693, 44.1717, 44.1723, 44.3238,

1977, April 23. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 315), Hamilton, Stansbury. Best Source: UT 44.1485.

1977, April 30. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, Neiland, Ryon, Turner, Wunderland.

1977, May 7. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 316), C.P. Henger..

1977, May 14. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 318), C. Heacock.

1977, Sept 10. Roan Creek, trib to Watauga, at lower falls off rt 34-421, 2.9 air miles southeast center of Mountain City. Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 371), C. Heacock.

1977, Sept 24. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 378), Neiland.

1977, Oct 8. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 391), C. Hamilton.

1977, Nov 12. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 402).

1978, Jan 28. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 410), Ryon.

1978, Feb 25. Roan Creek at small bridge off st rt 2374 East of junction 2374-2576. Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 417), Kauffman.

1978, Mar 11. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 421), Peterson, Legler.

1978, April 14. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 437), Brown, Williams.

1978, June 29. Roan Creek at mouth of Forge Creek off rts 34-421, 2.3 air miles SSE Mountain City (center). Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 476), Doug Hamilton.

1978, June 29. Roan Creek off co rt 2374, 1.3 rd mi northeast of junction co rts 2374-2576, 8.8 air miles southwest center of Mountain City. Johnson County, Tennessee. Beets, N.M. Burkhead (NMB 475), Glen D. Hamilton.

1978, June 29. Roan Creek off co rt 2374 behind church upstream from mouth of Hopper Creek. Johnson County, Tennessee. Beets.

Watauga River in North Carolina.

1941, Aug 20. WR, .2 miles above mouth of Cove Creek, elevation 2700'. J. R. Bailey (JRB 41-20). Best Source: UMMZ 156985.

1980, Oct 3. Cove Creek trib to Watauga River off NC 321, below sugar grove, 0.4 miles southwest of Sugar Grove. Mickey, Wakefield, NC Dept of Enviro. Mg. Best Source: UAIC 9425.01-9425.03.