To the Graduate Council:

I am submitting herewith a thesis written by Rick Dwain Bivens entitled "History and Distribution of Brook Trout in the Appalachian Region of Tennessee." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Wildlife and Fisheries Science.

Richard J. Strange, Major Professor

We have read this thesis
and recommend its acceptance:

Accepted for the Council:

The Graduate School

HISTORY AND DISTRIBUTION OF BROOK TROUT IN THE APPALACHIAN REGION OF TENNESSEE

A Thesis

Presented for the

Master of Science

Degree

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Rick Dwain Bivens

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ABSTRACT

Brook trout (Salvelinus fontinalis)populations have been declining in the southern Appalachians and especially in Tennessee since 1900. To assess the loss of range of this southern trout, various agencies have inventoried most of the major trout streams in Tennessee over the past 10 years. To date, however, these surveys have remained disjunct and in some cases overlapping.

Survey reports and field data of brook trout inventories made from 1974 to 1984 were examined to determine the current distribution in Tennessee. Brook trout currently inhabit 275.6 kilometers in 135 streams found in eight east Tennessee counties. Brook trout occur allopatrically in 195.7 kilometers and sympatrically with rainbow trout (Salmo gairdneri) and in some cases brown trout (Salmo trutta) in another 79.9 kilometers. During the course of the recent surveys, 32 previously undocumented streams were found to have brook trout populations.

Brook trout in Tennessee are generally relegated to the less optimum habitat of small headwater streams above 925 meters elevation. These streams usually have soft water, low fertility, and are slightly acidic. Eighty-five selected brook trout streams had a mean pH value of 6.8 with a range 5.2 to 7.5. The mean percent gradient of the brook trout sections of 80 selected streams was 10.0% with a range of 3.0 to 23.0%. Brook trout collected during the study period from 41 streams had an overall mean total length of 151.5 millimeters, weight of 45.5 grams, and condition factor (K) of 1.12.

Brook trout now occupy an estimated 20 to 30% of their former 1900 range. Habitat degradation from past and present development projects, logging, forest fires, unregulated harvest, and introduction of exotic salmonid species have severely reduced the brook trout to its present range and distribution. Most of the loss probably occurred in the early 1900's, but recent surveys prove that the process is ongoing. Current losses of brook trout populations are attributed mainly to the encroachment of rainbow trout as well as stream degradation. Only 33% of the current brook trout streams are known to have waterfall barriers that restrict the upstream movement of rainbow trout.

Data on 213 current, previous, and re-established or renovated brook trout streams are presented in appendix form in this thesis.

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CHAPTER I

INTRODUCTION

The topography of Tennessee is among some of the most varied in the United States. It encompasses several major geological and physiographical provinces ranging from swampy, lowland river bottoms in the west to the Appalachian Mountains in the east.

Arising in Newfoundland, the Appalachian Mountains have a northeast-southwest orientation and terminate in northern Alabama, Georgia, and South Carolina. The southern Appalachians were at the edge of Pleistocene glaciation and although unglaciated, the biota has experienced the effects of glaciation. This effect has been an almost complete ecological isolation of many plant and animal species. Some species are found nowhere else in the world and others are at the extremities of their range (Brooks 1971).

The portion of the southern Appalachian Mountains in Tennessee is called the Unakas. They are a very ancient range of mountains and parent material is Precambrian rocks that are commonly metamorphic slate, phyllite, and schist (Miller 1974). Within the Unaka Range some of the more prominent mountains are the Unicoi Mountains in the south, the Great Smoky Mountains in the middle, and the Stone Mountains, Holston Mountains, and Iron Mountains to the north. These are rugged mountains, characterized by steep forested slopes, crested ridges, and deep, narrow valleys. There are several peaks over 1,829 meters (6,000 feet) elevation mean sea level (msl) and the highest point in

Tennessee is Clingmans Dome at 2,024 meters (6,642 feet) elevation. Rainfall is generally abundant and rushing streams, with many waterfalls, form dendritic drainage patterns. With the exception of a few streams in the southernmost section of Polk County, the streams of the Unaka Range drain northwest to the Tennessee River and on to the Gulf of Mexico by the Ohio and Mississippi rivers. The major streams that drain the Unakas are the Ocoee, Hiwassee, Tellico, Little Tennessee, Pigeon, French Broad, Nolichucky, Watauga, and South Fork Holston rivers (Luther 1977; Miller 1974).

The cold, clear mountain streams of east Tennessee are the habitat of the states only native salmonid, the brook trout (Salvelinus fontinalis). This popular and prized trout is generally called the mountain or speckled trout by the mountain folk of east Tennessee. Although brook trout is the accepted common name, it is actually a member of the char genus. According to the American Fisheries Society (1980) its taxonomic classification is:

Class: Osteichthyes
Order: Salmoniformes
Family: Salmonidae
Genus: Salvelinus
Species epithet: fontinalis

The original range of the brook trout in North America was to the north in Canada from the eastern tip of Manitoba, east along the Hudson Bay and throughout Quebec and Labrador; in the United States from New England to the headwaters of the Mississippi River in Minnesota and Wisconsin; southward along the Appalachians in West

Virginia, Virginia, Tennessee, North Carolina and northern Georgia and South Carolina. Its range has been greatly extended by introductions in the western United States and Canada and the continents of Asia, Africa, Europe, and South America (MacCrimmon and Campbell 1969). In Tennessee the brook trout is near the southern limit of its native range.

Prehistorically, brook trout probably inhabited almost all streams on mountainous land throughout the Unakas as well as other parts of its southern range. But by the early 1900's, the numbers and range of the southern trout had been severely reduced and brook trout distribution, in general, has declined steadily in southeastern states over the past 50 years (Seehorn 1978).

These losses have been mainly attributed to logging, development projects, and invasion by exotic salmonids, primarily the rainbow trout (Salmo gairdneri). The brook trout is very specific in its habitat requirements and declines in its population are indicative of environmental degradation (Argow 1978). Therefore, it is easy to understand why brook trout populations declined after 1900. Widespread logging, clearcutting timber all the way to streambanks, forest fires, road and railroad building, brush clearing, and other man-made disturbances without concern for water quality, along with unmanaged fishing practices and introduction of exotic trout species occurred on almost all mountainous lands in Tennessee. Siltation and increased water temperature due to these disturbances caused the extripation of brook trout from main streams and restricted them to headwater tributaries in most cases (King 1937; Lennon 1967;

Amundsen and Eason 1979; Strange 1979). In the Great Smoky Mountains National Park (GSMNP) for example, the distribution of brook trout in 1926 was reported to correspond with areas where logging had not taken place (Powers 1929). On mountainous land just south of the Park, from 1908 to 1928 the Babcock Lumber Company extensively logged the area now known as the Tellico Wildlife Management Area, leaving only a few inaccessible areas of virgin timber. Almost all the tributaries of the Tellico River were cut over and denuded by logging operations. Trout populations were so low by 1928 that the main portion of the Tellico River was the only stream in the entire area considered worth fishing (Shields 1951). Further to the south, the Conasauga Lumber Company extensively logged the extreme southeast corner of Tennessee in the early 1900's and brook trout were evidently extripated from the area by 1930.

After the establishment of the GSMNP in the late 1920's, logging and other disturbances stopped and eventually water quality improved. Improved water quality also took place on sections of Forest Service and private land over the years in cases where commercial disturbances ceased. However, in the early 1900's, logging companies which were responsible for much of the stream degradation were also responsible for introducing rainbow trout. Milk cans with rainbow trout fingerlings were carried by railroad cars along tracks once used to haul out timber, and dumped into streams at trestle crossings. Stocking of rainbow trout also continued until the mid 1970's in the GSMNP and is still carried out on most Forest

Service and private land (King 1937; Lennon 1967; Amundsen and Eason 1979; Strange 1979; Kelly et al. 1980).

As early as the mid 1930's and early 1940's in the GSMNP, as the land healed and water quality improved, it was recognized that the brook trout failed to recover lost habitat and that rainbow trout were on an upstream movement from where they had been stocked (King 1937; Holloway 1945). It can be assumed that the same thing also occurred on Forest Service and private land.

Although not clearly understood, most authorities agree that invasion by upstream moving rainbow trout is the prime suspect in current declines of brook trout populations (Amundsen and Eason 1979; Strange 1979; Kelly et al. 1980). A competitive disadvantage for the brook trout is considered to be the cause of this decline where the two species occur sympatrically.

In the GSMNP, Powers (1929) and King (1937, 1939, 1940) were first to note changes in the distribution of trout in Park streams. Later changes in distribution were reported by Holloway (1945) and Lennon (1967). Limited information is available outside the Park on Forest Service and private land. The earliest survey reports on streams north and south of the GSMNP are those by Shields (1950, 1951). Tatum (1968) listed brook trout streams in the upper east Tennessee region. Streams that had brook trout were also reported by the Tennessee Wildlife Resources Agency (TWRA) survey reports from 1967 to 1970.

Fisheries biologists and resource managers of various agencies began population inventories in the mid to late 1970's to determine

the brook trout's current range and distribution. Personnel of the United States Fish and Wildlife Service surveyed trout streams in the GSMNP. Streams on the Tennessee side of the Park were surveyed in 1974 and 1975 (Kelly et al. 1980). Forest Service inventories were made in 1978 and 1979 (Barb 1978; Elsen 1978; Bivens 1979) and Whitworth and Strange (1979) surveyed streams on private land. Recent and updated surveys were made on Forest Service, private, and GSMNP streams (Bivens 1984; Broadbent and Bivens 1984).

For the most part, these inventory surveys were completed by 1980. However, to date they have remained disjunct and in some cases overlapping. Much of the valuable information on brook trout streams collected during these surveys has been put away in the files of various agencies and is not readily available to researchers. Therefore, the need for a comprehensive survey data report on brook trout distribution in Tennessee existed.

The primary objective of this report is to provide a complete current range distribution of all known brook trout populations in Tennessee. The secondary objective is to document on a stream by stream basis, all current available information on streams that were known to have brook trout populations in the late 1960's, streams that currently have brook trout, and streams that have been renovated in efforts to restore or establish brook trout populations. The ultimate goal is to provide baseline information for the future management of the species.

CHAPTER II

METHODS

Data used to compile the current range distribution in this study were based on a 10 year collection period, 1974 to 1984. Streams surveyed on Forest Service and private land were taken from a list compiled by Tatum (1968) and TWRA county inventories of streams from 1967 to 1970. Other streams checked were suggested by TWRA personnel, Forest Service personnel, or local residents.

Beginning in 1972 and continuing through 1977, the United States Fish and Wildlife Service and National Park Service personnel conducted population surveys of all major trout streams and tributaries in the GSMNP. Except for a few streams that had updated surveys this year (Broadbent and Bivens 1984), streams on the Tennessee side of the Park included in this report were surveyed in 1974 and 1975 (Kelly et al. 1980).

Forest Service inventories for the most part were completed in 1978 and 1979 (Barb 1978; Elsen 1978; Bivens 1979). Other Forest Service streams were surveyed from 1980 to 1983 (Elsen 1980, 1981, 1982, 1983). Streams on private land outside the GSMNP and Forest Service holdings were surveyed in 1978 and 1979 (Whitworth and Strange 1979). Additional surveys were made, and updated information collected on both private and Forest Service streams this year (Bivens 1984).

All survey reports, field data and notes, field information, and field survey maps from the surveys were reviewed. Also, most of the information on the GSMNP streams came from the files of the National Park Service and from the 1972 to 1977 brook trout distribution map on display at the National Park Headquarters in Gatlinburg, Tennessee.

An intensive effort was made to compile this information and to eliminate errors and overlapping. All current, available information on streams that had brook trout in the late 1960's, that currently have brook trout, or renovated brook trout streams was documented on a stream by stream basis and is presented in Appendix A.

In general, streams were surveyed by using light weight backpack electroshocking devices of various types and standard electrofishing techniques. The electroshocking units were usually gas powered generators with output ranging from 125 to 750 volts A.C., although some D.C. battery powered units were also used. The standard procedure used by most biologists was to sample streams and tributaries from the mouths (or other points, e.g., National Park or Forest Service boundary lines, etc.) to the uppermost headwaters. Sampling took place at various intervals along the streams and sample sites were variable in length, however, they were usually from 100 to 200 meters. The approximate position of each sample site was located and recorded on standard Tennessee Valley Authority (TVA) and United States Geological Survey (USGS) 7.5 minute topographical maps, 1:24,000 scale.

Brook trout in Tennessee are usually found in small headwater streams and exist either allopatrically or sympatrically with rainbow trout and in a few cases with brown trout (Salmo trutta). The location of the upper and lower limits of allopatric populations of both brook trout and rainbow trout were recorded on field maps by determining approximate elevations. In some cases, the worker only estimated the upper limit elevation. The upper and lower elevations of sympatric zones were also recorded in the same manner. Allopatric populations were generally defined as 90% or more of one species and 10% or less of the other (Whitworth and Strange 1979). The approximate length of allopatric and sympatric zones were later determined from the topographical maps using a map measuring wheel. The locations of waterfalls and cascades were also noted on field maps. The vertical height of some waterfalls was measured in the field by lowering a measuring tape from the top of the falls to its splash pool below where possible. It is realized that this is not a totally accurate method, but it did give a good approximation in many cases. Heights of other falls were visually estimated and in many cases they were only noted as barrier falls or cascades. A barrier falls is generally defined (Kelly et al. 1980) as having a vertical height of about 2.4 meters (8.0 feet) or more.

Most workers recorded information on length and weight of all trout collected. Generally, the fish were measured to the nearest millimeter (mm) for total length and weighed to the nearest gram (g). However, some survey reports listed fish collected by size class only.

Fish species other than trout were also noted. Blacknose dace (Rhinichthys atratulus) and sculpin (Cottus spp.) were generally the most common fish occurring with brook trout.

Since one of the main objectives of this study was to compile comprehensive survey data, it is necessary to explain the methods used to develop the stream descriptions in Appendix A. Items of information covered in each individual stream description include, reference number and name of stream, map location, ownership pattern, elevation, aspect, stream size, percent grade, barriers, water quality, sources of pollution, other species present, fish collected, stream conditions, vegetative conditions, and discussion. When no data were available under a particular item, not recorded was entered.

A reference number was given to each stream. Beginning with 001, streams were numbered in successive order as they occurred in the drainage pattern from south to north. Stream reference numbers are found in Table 6, Appendix A.

The names of streams are listed as they appear on the particular TVA and USGS topographical map on which they are located. In many instances, streams have additional local names or they have been reported under different names by earlier workers. In such cases, these names are listed in parentheses beside the correct topographical map name. The word headwaters in parentheses beside the name indicates that only the headwaters of the stream are described. Streams that had no name on the topographical map were given names to identify and delineate previously unlisted brook trout populations.

Under map location, the name and TVA number is given for the corresponding 7.5 minute quadrangle map/maps on which the stream occurs. The location of the described stream's headwaters, along with the next major stream to which the described stream is a tributary is also listed. Also, the county or counties through which the stream flows is given. Streams that have no names on the quadrangle maps are also described here by their elevations and their proximities to landmarks such as ridges, gaps, or mountain peaks that are named on the map. A list of the names of quadrangle maps used, their TVA numbers, and edition year are given in Table 7, Appendix B.

The ownership pattern of each stream is described. Most streams fall either partially or entirely on federal lands. A few are entirely on private land. Stream lengths were measured with a map measuring wheel from the topographical maps. The length of each ownership portion or the total length is given in kilometers (km) to the nearest tenth km and also in miles (mi) to the nearest tenth mile. Streams on federal land are either on National Park or Forest Service lands and are listed as such.

Elevation at the mouth and head of each stream is given in meters (m) and also in feet (ft). Elevations were determined from topographical maps in feet and converted to the nearest whole meter. Some stream elevations are described at other points, e.g., boundary lines or confluence with tributary streams.

The general aspect of each drainage is recorded as north, south, east, west, southeast, northwest, etc. Aspect is defined as the direction in which the stream flows.

Stream size was determined by various methods by different workers. Methods used to determine width, depth, velocity, volume, and water level conditions of streams in Forest Service surveys were described by Seehorn (1970) and the United States Department of Agriculture Forest Service (1973). The United States Fish and Wildlife Service surveys recorded average stream widths at sample sites. Stream size parameters are recorded in both metric and English units. The date, elevation where determined, and source of data is listed for each stream.

Percent grade was determined by dividing the change in elevation from the mouth (or other designated point) to the head by the total length of the stream (or total length from designated point) and expressing the change as a percentage. Percent grade is the same thing as percent slope. Elevations and total length were determined from the topographical maps. Streams with percent gradients less than 10% are considered low gradient streams, 10 to 20% is moderate, and gradients greater than 20% are steep gradient streams.

Barriers to fish movement, both waterfalls and other potential barriers (cascades) were determined from field survey maps. Approximate heights of falls and elevations where they are located are recorded in both metric and English units. When the stream has no barriers the word none was used.

Water quality was determined by various methods by different workers. In general, standard Hach Kits were used. Various parameters are recorded for some streams and most streams have at least pH and water temperature measured. A visual estimate of siltation

reported in grades of light, medium, or heavy is given for some streams. The date, location where determined, and source of the data is listed for each stream.

Sources of pollution, generally in terms of sources of siltation, are listed for some streams. The word none was used only where streams had no siltation pollution. Some other forms of pollution were also recorded.

Other species present were listed for each stream when the information was available. Other fish species, crayfish, salamanders, snails, and aquatic insect larvae are included for each stream. The word none is used where no other fish species occurred.

Fish collected is used to present length and weight data of all trout collected. Average total length, weight, and coefficient of condition (K) was determined when field data were available to make the calculations. These calculations were made only on adult trout. Whitworth and Strange (1979) defined adults as fish that were greater than 100 mm. K values were determined, according to Ricker (1975), by the following formula:

$$K = \frac{W \times 10^5}{L^3}$$

where: K = Condition Factor

W = Weight (in grams)

L = Length (in millimeters)

Numbers of trout greater than and less than 100 mm are also listed to give some indication of population structure. Dates of collections and sources of information are also given.

Stream conditions were determined by visual estimates of stream bed constituents as defined by Seehorn (1970) and the United States Department of Agriculture Forest Service (1973). These estimates were made by walk surveys of the entire stream but were not always accomplished on all streams. To estimate overall percentages of pools, riffles, flats, and cascades or bedrock areas walk surveys were made. Visual estimates of siltation were made and recorded according to varying degrees of light to heavy. However, all estimations are subject to the individual biologist's interpretations. A general statement on stream bottom and habitat conditions is usually made.

Percentage amounts of terrestrial vegetation composition were determined by visual estimates of vegetative conditions. Predominant overstory and understory species are listed. Some reports only listed the percent of canopy or cover.

Discussion sections are given for all streams listed. The discussion usually includes a brief history of early stream work or previous surveys, general statement of overall stream condition, amount of stocking that has been done, current distribution of trout, and management suggestions or implications.

CHAPTER III

RESULTS

Almost all the major Appalachian trout streams in Tennessee have been surveyed to some extent over the past 10 years. Out of the hundreds of streams checked only 135 currently have brook trout populations. These 135 streams are found in eight east Tennessee counties and have a total of 275.6 km (171.3 mi) of brook trout water. Brook trout occur allopatrically in 195.7 km (121.6 mi) and sympatrically with rainbow trout and in some cases brown trout in another 79.9 km (49.7 mi). Over half of the streams, 53% (71 streams) have sympatric populations and 64 of the streams have allopatric brook trout populations. Brook trout streams, along with their sympatric/allopatric distribution and elevations where brook trout were found are listed in Table 1.

Native brook trout populations in Tennessee are generally confined to higher elevation streams. The mean lower elevation where brook trout were found is 926 m (3,037 ft) elevation with a range of 439 to 1,430 m (1,400 to 4,692 ft) elevation. The mean upper elevation where brook trout were found is 1,133 m (3,718 ft) elevation with a range of 610 to 1,561 m (2,001 to 5,121 ft) elevation.

Brook trout streams occur in eight east Tennessee counties under both federal and private ownership. Streamlength distribution of sympatric and allopatric populations are divided into Forest

Table 1. Current distribution of brook trout in Tennessee streams, elevation where found, and population streamlengths.[a]

Stream Name	Number in Appendix A	Elevation (Meters) Where Brook Trout Begin	Where Brook Trout End	Streamlength (Kilometers) Sympatric	Allopatric	Total
Bald River[b]	003	671	1036	0.3	3.5	3.8
Henderson Branch	005	628	719	1.9	1.0	2.9
Meadow Branch	007	988	1146	1.8	-	1.8
Roaring Branch	008	981	1134	0.2	0.8	1.0
Rough Ridge Creek	010	890	1158	1.0	1.3	2.3
Falls Branch[b]	011	866	1140	1.4	1.3	2.7
Little River[b]	012	1268	1487	0.5	0.8	1.3
Spruce Flats Branch	013	512	610	-	1.9	1.9
Sams Creek	014	853	1280	1.6	1.8	3.4
Starkey Creek	015	965	1146	-	1.3	1.3
Lynn Camp Prong	016	975	1244	1.8	1.6	3.4
Marks Creek	017	744	933	1.8	0.5	2.3
Indian Flats	018	884	1219	0.5	2.1	2.6
Ridge Branch[c]	019	956	1036	-	0.6	0.6
Seng Patch Branch	020	1032	1128	-	0.5	0.5
Davis Branch[c]	021	1035	1061	-	0.5	0.5
Meigs Creek	022	439	664	-	4.3	4.3
Laurel Branch	023	792	866	-	0.3	0.3
Tanager Branch	024	817	841	-	0.2	0.2
Huskey Branch	027	762	1000	-	1.9	1.9
Fish Camp Prong	028	1036	1305	2.4	1.1	3.5
Goshen Prong	029	1073	1341	0.6	1.9	2.5
Jenkins Creek[c]	030	1122	1402	-	2.4	2.4
Left Branch	031	1208	1341	-	0.8	0.8

Table 1. Continued.

Stream Name	Number in Appendix A	Elevation (Meters) Where Brook Trout Begin	Elevation (Meters) Where Brook Trout End	Streamlength (Kilometers) Sympatric	Streamlength (Kilometers) Allopatric	Streamlength (Kilometers) Total
Double Spring Branch[C]	032	1241	1487	-	1.9	1.9
Silers Creek	033	1035	1353	1.0	1.8	2.8
Narrows Branch	034	1155	1317	-	1.3	1.3
Buckeye Gap Prong	035	1081	1305	1.4	1.0	2.4
Small Branch[C]	036	1114	1244	-	0.6	0.6
Shelter Spring Branch[C]	037	1122	1378	0.3	1.1	1.4
Meigs Post Prong	038	1116	1561	0.2	1.8	2.0
Sweet Creek	039	1128	1329	-	1.8	1.8
Grouse Creek	040	1026	1359	0.8	1.3	2.1
Spud Town Branch	041	1050	1341	-	1.8	1.8
Rattler Branch	042	1134	1463	-	1.6	1.6
Devil Branch	043	1196	1487	-	1.0	1.0
Snake Tongue	044	1247	1408	-	0.6	0.6
Kuwahi Branch	045	1074	1463	0.5	1.9	2.4
Love Branch[C]	046	1314	1463	-	1.0	2.0
Twin Creek	048	549	689	1.4	-	1.4
Bales Branch[C]	049	853	902	-	0.3	0.3
Road Prong	050	1061	1487	0.6	3.2	3.8
Walker Camp Prong	051	1128	1430	4.3	2.4	6.7
Alum Cave Creek	052	1161	1177	-	0.3	0.3
Kephart Branch[C]	053	1430	1524	-	0.8	0.8
Dunn Creek	054	567	1274	-	6.8	6.8
Middle Prong Little Pigeon River	065	732	988	3.1	0.2	3.3
Ramsay Prong	066	799	914	1.0	-	1.0
Buck Fork	067	866	1536	2.1	3.7	5.8

Table 1. Continued.

Stream Name	Number in Appendix A	Elevation (Meters) Where Brook Trout Begin	Where Brook Trout End	Streamlength (Kilometers) Sympatric	Allopatric	Total
Eagle Rocks Prong	068	907	1378	0.2	4.2	4.4
Laurel Top Branch[c]	069	1164	1451	-	1.9	1.9
Copper Gap Branch[c]	070	1230	1402	-	1.4	1.4
Pecks Branch[c]	071	1248	1402	-	1.1	1.1
Lost Prong	072	988	1292	-	1.6	1.6
Chapman Prong	073	988	1402	-	2.6	2.6
Sequoyah Branch[c]	074	1244	1439	-	1.0	1.0
Cosby Creek[b]	075	616	1061	2.4	1.3	3.7
Indian Camp Creek	076	658	1353	0.3	4.3	4.6
Otter Creek	077	1012	1341	-	1.6	1.6
Copperhead Branch	078	1097	1280	-	0.8	0.8
Toms Creek	079	620	1073	0.2	3.1	3.3
Sunup Branch[c]	080	853	1073	-	0.6	0.6
Panther Branch	081	963	1067	-	0.5	0.5
Rock Creek	082	623	1183	0.2	2.6	2.8
Little Rock Creek	083	963	1329	-	1.4	1.4
Middle Branch[c]	084	1067	1353	-	0.8	0.8
Camel Hump Creek	085	828	1131	0.2	1.4	1.6
Dry Branch	086	829	1085	0.2	1.0	1.2
Middle Prong Gulf Creek	088	975	1109[d]	0.2	1.6[d]	1.8
Brown Gap Creek	089	927	1183[d]	0.2	2.3[d]	2.5
Clear Fork	117	1061	1094	0.3	-	0.3
Higgins Creek	120	841	1085	-	3.2	3.2
Birchfield Camp Branch	121	875	1210	-	1.9	1.9
Rocky Fork[b]	124	914	1119[d]	3.2[d]	-	3.2
Blockstand Creek	127	914	1012[d]	0.2	1.0[d]	1.2
Broad Branch	128	936	982[d]	0.5[d]	-	0.5

Table 1. Continued.

Stream Name	Number in Appendix A	Elevation (Meters) Where Brook Trout Begin	Elevation (Meters) Where Brook Trout End	Streamlength (Kilometers) Sympatric	Streamlength (Kilometers) Allopatric	Streamlength (Kilometers) Total
Fort Davie Creek	129	985	1061[d]	0.5[d]	-	0.5
Jones Branch	132	539	683	-	1.9	1.9
Doe River[b]	133	913	1036	1.9	0.8	2.7
Little Laurel Fork	135	872	1062	0.3[e]	2.9	3.2
Leonard Branch	137	875	1106	0.8[e]	2.7	3.5
Wagner Branch	138	887	1097	1.0[e]	1.9	2.9
Moreland Branch	139	908	1097	-	3.1	3.1
White Rocks Branch[c]	140	936	1024	0.6[e]	0.6	1.2
Cook Branch	142	965	1038	1.6[e]	-	1.6
Camp Fifteen Branch[c]	143	971	1041	0.8[e]	0.6	1.4
Bitter End Branch[c]	144	972	988	0.2[e]	-	0.2
Camp Ten Branch	145	981	1030	-	1.6	1.6
Clarke Creek	147	1030	1116	-	1.6	1.6
Tiger Creek	148	695	1134	7.2	1.4	8.6
Roberts Hollow[c]	149	928	1109	-	1.9	1.9
Bill Creek	150	963	1109	0.2	2.1	2.3
Fall Branch	151	974	1180	-	1.8	1.8
Ruins Branch[c]	152	988	1061	-	1.1	1.1
No-Name Creek[c]	153	1067	1085	-	1.1	1.1
George Creek	154	820	1164	0.5	4.2	4.7
Heaton Creek	155	1097	1219[d]	1.3[d]	-	1.3
Toms Branch	156	975	1195	0.5	1.6	2.1
Middle Branch	158	994	1256	0.3	1.9	2.2
Right Prong Middle Branch[c]	159	1158	1268	-	0.6	0.6
Panther Branch	160	977	1036	-	1.0	1.0
Cove Creek	161	988	1292	0.2	2.3	2.5
Little Cove Creek	162	1001	1146	-	2.3	1.3

Table 1. Continued.

Stream Name	Number in Appendix A	Elevation (Meters) Where Brook Trout Begin	Elevation (Meters) Where Brook Trout End	Streamlength (Kilometers) Sympatric	Streamlength (Kilometers) Allopatric	Streamlength (Kilometers) Total
Duck Branch	163	1000	1012	-	0.2	0.2
Stony Creek[b]	164	756	972	2.4	-	2.4
Little Stony Creek	165	588	817	1.4	2.1	3.5
North Fork Stony Creek	166	792	914	0.2	1.3	1.5
Pole Branch	167	792	866	-	0.5	0.5
Mill Creek	169	732	878[d]	-	2.1[d]	2.1
Vaught Creek	170	792	840	-	1.0	1.0
Furnace Creek	171	840	1012	-	1.9	1.9
East Fork	172	1009	1018	-	0.2	0.2
Corn Creek	174	850	1006	-	1.8	1.8
Cress Branch	175	869	939	-	1.0	1.0
Payne Hollow	176	853	963	-	0.8	0.8
Little Laurel Branch	179	628	817	0.2	1.6	1.8
Morgan Branch	180	792	914	-	1.3	1.3
Rockhouse Run	186	762	920	-	2.3	2.3
Tank Hollow	188	663	902	0.2	2.3	2.5
Chalk Branch	190	725	817	0.5	0.8	1.3
Maple Branch	191	692	853	1.9	-	1.9
Fagall Branch[f]	193	725	942	2.3	1.0	3.3
Birch Branch	194	820	1024	1.4	2.3	3.7
Parks Branch	196	817	1049	3.9	-	3.9
Heaberlin Branch	198	805	1055	0.5	1.9	2.4
Johnson Blevins Branch	199	914	1122	1.1	1.9	3.0
Jim Wright Branch	202	910	1012	0.5	0.6	1.1
East Fork Beaverdam Creek	203	890	1097	0.5	1.8	2.3
Valley Creek	204	975	1158	-	1.3	2.3

Table 1. Continued.

Stream Name	Number in Appendix A	Elevation (Meters) Where Brook Trout Begin	Elevation (Meters) Where Brook Trout End	Streamlength (Kilometers) Sympatric	Streamlength (Kilometers) Allopatric	Streamlength (Kilometers) Total
Richardson Branch	205	985	1000[d]	-	0.2[d]	0.2
Gentry Creek	207	878	1170	2.6	2.1	4.7
Grindstone Branch	208	850	978	1.0	0.8	1.8
Kate Branch	209	899	1149	0.6	1.8	2.4
Gilbert Branch	210	1090	1219	-	1.6	1.6
Hoot Owl Hollow	211	789	902	-	3.4	3.4
Total				79.9	195.7	275.6

[a]Based on stream survey data collected from 1974 to 1984.

[b]Headwaters only.

[c]Stream that has no name on the topographical map. See Appendix A for description of location.

[d]Estimated value.

[e]Brook trout sympatric with brown trout.

[f]Brook trout sympatric with both brown trout and rainbow trout.

Service, National Park, and private land ownership and are presented in Table 2.

Many of the brook trout streams in Tennessee occur on GSMNP land. Sixty-two streams in the Park have 124.7 km (77.5 mi) of brook trout water or about 45.2% of the total streamlength distribution of brook trout for the state. A total of 51 streams on Forest Service land have 102.2 km (63.5 mi) or 37.1% of the total streamlength distribution occurs in 35 streams under private ownership (Table 3). Many of the streams under private land ownership have only small portions of brook trout water and occur on both federal and private land.

Sevier County has the most brook trout water, 98.0 km (60.9 mi) or 35.6% of total streamlength distribution for the state occurs in 49 streams, almost all of which are in the GSMNP. Carter County has 66.7 km (41.5 mi) or 24.2% of the total in 32 streams and Johnson County has 51.9 km (32.3 mi) or 18.8% of the total distribution in 25 streams. Cocke County has 27.2 km (16.9 mi) or 9.9% of the total distribution in 14 streams. All but two of the streams in Cocke County are in the GSMNP. Monroe County has 14.5 km (9.0 mi) or 5.3% of the total in six streams, all of which are on Forest Service land. Unicoi County has 7.9 km (4.9 mi) or 2.9% of total in six streams. Greene County and Blount County have the lowest amount of brook trout water. Greene County has 4.8 km (3.0 mi) or 1.7% of the total distribution in four streams. Blount County has only 4.6 km (2.9 mi) or 1.7% of the total in three streams, all of which are in the GSMNP.

Table 2. Tennessee distribution of native brook trout populations by county and land ownership.

County	Number of Streams	Streamlength (Kilometers)						Total
		Forest Service		National Park		Private Land		
		Sympatric	Allopatric	Sympatric	Allopatric	Sympatric	Allopatric	
Monroe	6	6.6	7.9	-	-	-	-	14.5
Blount	3	-	-	-	4.6	-	-	4.6
Sevier	49	-	-	26.1	71.1	-	0.8	98.0
Cocke	14	-	-	3.5	19.4	0.4	3.9	27.2
Greene	4	-	-	-	-	4.0	0.8	4.8
Unicoi	6	0.3	1.9	-	-	0.4	5.3	7.9
Carter	32	10.3	34.5	-	-	11.3	10.6	66.7
Johnson	25	15.3	25.4	-	-	1.7	9.5	51.9
Total	a	32.5	69.7	29.6	95.1	17.8	30.9	275.6

[a]Total number of brook trout streams is 135, sections of some streams are in more than one county.

Table 3. Current Tennessee distribution of native brook trout populations by land ownership.

Land Ownership	Number of Streams	Streamlength (Kilometers) Sympatric	Allopatric	Total	% of Total Streamlength
Forest Service	51	32.5	69.7	102.2	37.1
National Park	62	29.6	95.1	124.7	45.2
Private	35	17.8	30.1	48.7	17.7
Total	a	79.9	195.7	275.6	

[a]Total number of brook trout streams is 135; portions of some streams occur on both private and federal lands.

Many native brook trout populations are protected from encroachment of exotic trout species by barriers to fish movement. These barriers are usually waterfalls that have at least 2.4 m (8.0 ft) vertical drop. Therefore, it is important to know the streams that have these functional barriers and their locations. Of the streams that currently have brook trout, only 33% (44 streams) have these barrier falls, and 27% (37 streams) have no barriers at all. No data were available for 40% (54) of the streams listed (Table 4). Two streams, Jones Branch in Unicoi County and Rockhouse Run in Johnson County have functional barriers of a different type. Both streams flow into and beneath the substrate in their lower reaches, creating a barrier to fish movement. One stream in the GSMNP has an acid barrier. Walker Camp Prong is a natural Anakeesta drainage and has a resultant low pH in its headwaters. There are no physical barriers to fish movement but rainbow trout have never moved into the upper stream. Rough Ridge Creek in Monroe County and Tank Hollow, Chalk Branch, Maple Branch, Fagall Branch, Heaberlin Branch, East Fork Beaverdam Creek, and Kate Branch in Johnson County have had additional, modified, or recently installed man-made barriers.

Selected characteristics of native brook trout streams in Tennessee are given in Table 8, Appendix C. From these characteristics the mean percent grade and pH for selected streams were determined. The mean percent grade of the portion of the stream where brook trout were found in 80 selected brook trout streams is 10.0% with a range of 3.0 to 23.0%. These selected streams had brook trout

Table 4. Number of brook trout streams and percent of total number of brook trout streams that have functional barriers.[a]

Functional Barrier Present	Number of Streams	% Of Total
Yes	44	33
No	37	27
No data	54	40

[a]A functional barrier is a waterfall that has at least 2.4 m (8.0 ft) vertical height from the top to the splash pool.

population streamlength distributions greater than or equal to 1.6 km (1.0 mi).

Streams of the southern Appalachians are generally soft water streams with low fertility and are slightly acidic. Eighty-five brook trout streams were examined for pH. These streams had a mean pH value of 6.8 with a range of 5.2 to 7.5.

Aspect, or direction of flow was examined for all native brook trout streams in Tennessee. The majority of the streams (66%) flow in a northerly direction; 17% flow north, 22% flow northeast, and 27% flow northwest. About 23% of the streams flow westerly; 10% flow to the west and 13% flow southwest. Of the remaining streams, 7% flow southeast, three streams flow south, and only two streams flow to the east.

The average total length, weight, and coefficient of condition (K) were examined for 41 native brook trout populations in east Tennessee and are presented in Table 5. Brook trout in Tennessee are generally confined to small headwater streams, usually having steep gradients. The streams are soft and infertile and the brook trout that inhabit them show a resultant small size. Brook trout collected during this survey period from various streams throughout east Tennessee had an overall mean total length of 151.5 mm (6.0 in), weight of 45.5 g (1.6 oz), and condition factor (K) of 1.12.

Considerable data were available on many trout streams, but lacking on others. In order to furnish biologists and resource managers a baseline for future management of brook trout in Tennessee,

Table 5. Mean total length, weight, and coefficient of condition (K) for brook trout in Tennessee streams.[a]

Stream Name	n[b]	Average Total Length (mm)	Average Weight (g)	Average K
Spruce Flats Branch	6	206.0	104.2	1.19
Indian Flats Prong	7	156.0	40.6	0.89
Meigs Creek	34	226.6	131.8	1.05
Laurel Branch	11	193.4	107.6	1.49
Tanager Branch	9	199.3	103.0	1.30
Walker Camp Prong	9	164.1	57.7	1.31
Alum Cave Creek	8	203.3	110.3	1.31
Kephart Branch	19	142.6	37.2	1.13
Dunn Creek	3	163.0	40.7	0.91
Cosby Creek	5	167.6	44.4	0.81
Middle Prong Gulf Creek	5	131.0	23.3	1.01
Clear Fork	2	123.5	21.5	1.14
Higgins Creek	6	182.0	82.1	1.26
Birchfield Camp Branch	7	146.6	34.0	1.08
Rocky Fork	22	150.0	39.0	1.01
Blockstand Creek	21	140.0	30.0	1.01
Doe River	24	148.5	41.4	1.26
Clarke Creek	7	152.0	45.6	1.22
Tiger Creek	24	141.4	32.8	1.16
Roberts Hollow	7	140.3	32.4	1.17
Bill Creek	26	125.4	23.0	1.17
Fall Branch	10	115.6	16.1	1.04
Ruins Branch	7	134.4	26.0	1.07
George Creek	10	149.0	42.8	1.02
Heaton Creek	3	180.0	72.3	1.07
Toms Branch	22	149.0	38.3	1.04
Middle Branch	5	144.0	33.4	1.11
Panther Branch	4	135.0	28.9	1.10
Cove Creek	11	132.5	27.5	1.18
Little Cove Creek	12	164.0	51.5	1.07
Duck Branch	3	119.0	21.3	1.26
Mill Creek	9	126.0	19.4	0.83
Vaught Creek	6	154.0	38.7	1.06
Furnace Creek	8	151.0	38.9	1.19
Corn Creek	8	147.3	38.1	1.19

Table 5. Continued.

Stream Name	n[b]	Average Total Length (mm)	Average Weight (g)	Average K
Cress Branch	7	137.6	32.6	1.25
Little Laurel Branch	8	167.9	61.0	1.29
Morgan Branch	11	142.4	33.0	1.14
Fagall Branch	13	129.5	24.3	1.12
Birch Branch	17	112.0	16.5	1.17
Jim Wright Branch	22	120.0	18.7	1.08
Mean Values		151.5[c]	45.4[d]	1.12[e]

[a]For adult fish greater than 100 mm.

[b]n = number of adult fish used in calculations.

[c]n (number of streams) = 41, S.E. = 26.3.

[d]n (number of streams) = 41, S.E. = 28.7.

[e]n (number of streams) = 41, S.E. = 0.14.

it was deemed important to compile these data in a comprehensive stream by stream description report. This report is Appendix A of this thesis.

CHAPTER IV

DISCUSSION

The demise of the brook trout in the southern part of its range and specifically in Tennessee can be mainly attributed to the influence of man. Habitat degradation from past and present development projects and the introduction of exotic salmonid species have been implicated in severely reducing the native trout to its present range and distribution. Other factors such as acid rain, anchor ice, inbreeding, and flooding are probably operating on brook trout populations to some extent but their impact is not clearly understood. In the early 1900's prior to sound fisheries management, unregulated harvest of brook trout by use of nets and explosives may have also played an important role in the reduction of the native trout. However, stream degradation in terms of siltation and the resultant reduction in spawning success coupled with the interaction of a severe competitor, the rainbow trout, are considered the primary causes.

Brook trout in Tennessee probably once inhabitated all suitable trout streams in the Appalachian region of the state. They are currently found in only 275.6 km (171.3 mi) of the states some 1,287 km (800 mi) of coldwater streams or about 21% of their former range. This represents not only a significant loss in streamlength distribution but also a greater loss in total habitat as most of the current brook trout populations occur in the smaller headwater portions of

streams. It is very probable that brook trout may be present in several, as yet unidentified, headwater streams in upper east Tennessee. It is also possible that many such streams have never been checked and surveys should be considered in future management plans. However, to date, almost all of the major streams and tributaries in Tennessee have been checked and this report is the most comprehensive listing of that work.

Brook trout in Tennessee are generally relegated to the less optimum habitat of headwater streams above 925 m (3,035 ft) elevation. These headwater streams are typical of all headwater streams in the southern Appalachians and are generally small in size, soft and infertile, and slightly acidic. The mean pH of Tennessee brook trout streams was found to be 6.8 with a range of 5.2 to 7.5. Generally though, brook trout are considered to be more tolerant of acidic conditions than are rainbow trout. Most of the streams (66%) flow in a northerly direction, however this is the case with most mountainous streams of the Unakas and is typical of the drainage pattern of the region.

It is assumed that brook trout were once abundant in almost all mountain streams in Tennessee. However, no accurate documentation of previous distribution exists and almost all change in distribution data comes from the GSMNP.

The majority of this information on trout distribution in the GSMNP comes from work by King (1937), Smith (1947), Lennon (1967), Jones (1978), and Kelly et al. (1980). Brook trout once occurred in nearly all headwater streams (Jones 1978) and were thought to occupy

approximately 680 km (423 mi) of GSMNP streams in 1900 (Moore et al. 1981). An estimated 55% decline in brook trout range occurred in Park streams between 1900 and 1930 (Kelly et al. 1980). A further decline of about 15% occurred between 1930 and 1959 and brook trout were estimated to occur allopatrically in only 48 of 226 headwater streams and sympatrically in 77 streams (Lennon 1967). By 1977, brook trout occupied approximately 198 km (123 mi) of streams in the GSMNP (Kelly et al. 1980) or about 29% of their original estimated range. About 124.7 km (77.5 mi) of brook trout water in the GSMNP occurs in 62 streams on the Tennessee side of the Park.

Early information on streams outside the Park is very limited. Brook trout south of the Park probably once occurred in all streams that now have rainbow trout, but with the exception of about six to seven streams, brook trout were apparently extripated from the area by 1930 (Shields 1951).

To the north of the Park, Tatum (1968) surveyed brook trout range on private and Forest Service lands. He estimated that approximately 230 km (143 mi) of brook trout water occurred in 68 streams found in six upper east Tennessee counties. These streams were surveyed again between 1978 and 1984 (Elsen 1978; Bivens 1979, 1984; Whitworth and Strange 1979). Out of Tatum's 68 streams, only 30 currently have brook trout populations, a decline of 56% in just a little over 10 years. Furthermore, the recent survey work found only 72.6 km (45.1 mi) of brook trout water in the 30 streams, a decline of 68% in the streamlength distribution described by Tatum. It can be assumed that Tatum's original streamlength distribution may have

been somewhat high as he assumed brook trout occurred from the mouth to the headwaters of the 68 streams listed. Brook trout generally do exist from the mouths of streams to the headwaters but not in all cases. Steep gradient is apparently a limiting factor in their headwater distribution. I have observed in field collections that brook trout do not tend to inhabit the steep sections of headwaters, even though ample habitat may exist. In cases of low gradient, brook trout are generally found all the way into the extreme headwaters of the stream. However, these findings do represent a significant loss (56 to 68%) in the brook trout range in upper east Tennessee over a short period of time.

County by county stream survey inventories were made by the TWRA from 1967 to 1970 in all east Tennessee counties. These inventories were a valuable source of information and they listed the occurrence of brook trout in 92 streams in nine counties. At present, only 52% (48) of these streams still have brook trout populations. This represents a significant loss, however, about 68 of these streams were also the ones reported by Tatum (1968) and have already been discussed. Also, others reported by TWRA may have only had stocked brook trout at the time they were surveyed.

During the course of recent surveys, an additional 32 previously undocumented streams were found to have brook trout populations. These streams represent an increase in the known distribution by about 49.6 km (30.8 mi).

It is difficult to accurately assess the loss of brook trout distribution in Tennessee. But, based on the estimates described above

it is very likely that brook trout populations have dwindled to about 20 to 30% of their former range. Most of this loss probably occurred in the early 1900's, but in light of recent surveys it is evident that the process is ongoing.

Due to the nature of the region, many species of plants and animals reach their natural limits in the southern Appalachians. Brooks (1971) stated that the ecological isolation of the region has provided an excellent stage for the development of endemic species and races. The uniqueness of the region and isolation of brook trout populations in the southern Appalachian Mountains led many fishermen and fisheries biologists to refer to the native brook trout as the southern Appalachian strain of the species (Sullivan 1935; King 1937; Holloway 1945). Lennon (1967) observed that brook trout in the GSMNP were significantly different from the northern brook trout in various respects and considered it valid to designate the Park brook trout as a southern Appalachian strain of brook trout. However, subsequent genetic studies based on electrophoretic data of allopatric brook trout populations from 11 states (Harris et al. 1978) gave no evidence that the southern trout constituted a distinct taxonomic entity. But, more recent genetic work (Stoneking et al. 1981) suggests that there is a sub-specific difference between northern and southern brook trout, and particularly GSMNP brook trout. Whatever the taxonomic status of the southern brook trout, there is no doubt that the fish that have evolved in and adapted to these harsh habitats of southern mountain streams do represent a distinct and valuable gene pool which, if lost, is irreplacable. Therefore, protection of remaining brook

trout populations should be and in most cases, is a top priority among fisheries biologists and resource managers.

Brook trout that currently occupy the streams listed in this report are probably native brook trout. That is to say that they are not the result of stocking of the New England strain of fish. At worst, they would possibly be in some cases a cross between the native trout and the northern strain. Although no data were available to confirm this, it became apparent that this was the case throughout the course of this study. The New England strain brook trout has been stocked in large numbers over the years in many streams, especially in the GSMNP. Holloway (1945) was first to note the unsuitability of stocking New England strain fish. He stated that they were less hardy in the soft waters of the Park and that all previous attempts to establish them had failed. Lennon and Parker (1959) also commented on the unsuitability of the northern strain brook trout and Lennon (1967) stated that the New England strain repeatedly failed to reproduce while hatchery reared, southern strain brook trout were able to survive and reproduce in Park streams. Attempts were made from 1965 to 1975 to establish brook trout populations by using hatchery stock of northern strain brook trout in the GSMNP streams. Even though these streams had no rainbow trout, brook trout were not established (Kelly et al. 1980). Northern strain hatchery brook trout have also been stocked in many streams outside the GSMNP. However, to date there is no known survival and establishment of hatchery brook trout (L. Price Wilkins and B. E. Wilson, personal communication). Conversely, stocking of southern strain brook trout in Tennessee streams

has proved successful (Holloway 1945; Lennon 1967; Wilkins 1961). Also, three GSMNP streams currently have established brook trout populations resulting from the stocking of native southern strain fish. Many of the current brook trout populations are long established and well documented native brook trout streams. Other streams, due to their small size and remoteness are considered highly unlikely to have ever been stocked.

If current trends prevail, the eventual extinction of the native brook trout from Tennessee streams may occur within the next 30 to 50 years. Habitat degredation is not so much the problem it once was, especially on federal lands where protection of watersheds is the general case. However, encroachment on brook trout habitat by the more aggressive rainbow trout is apparently the cause for alarm. Wolfe et al. (1978) and Helfrich et al. (1982) studied agonistic behavior between brook and rainbow trout and generally concluded that brook trout can compete with equal size rainbow trout. However, native Appalachian brook trout tend to be small in size, especially when compared to stocked rainbow trout. Whitworth (1980) found that rainbow trout move more than do brook trout and that their overall movement is generally upstream. Although this movement is small over a given period, it is probably consistent from year to year. This, coupled with the generally small size of native brook trout may give some insight as to why brook trout populations have been pushed further and further into their present headwater habitat.

It is hoped that this report will be a baseline for the future management of brook trout in Tennessee. With more federal money

eventually becoming available to state fishery programs due to the recently passed Dingell-Johnson expansion bill, it is also hoped that more brook trout projects and expanded brook trout recovery work will eventually halt the decline and, if possible, reverse the trend.

Resource managers and fisheries biologists should consider rainbow trout removal as top priority. In several cases brook trout populations are protected by waterfalls and in some instances man-made barriers have been installed. Where protected, streams should only be monitored from time to time and the real effort should be targeted at the unprotected streams.

First of all, management plans should be drawn up by the responsible agency or agencies in charge of managing the fishery. Streams in their order of need or importance should be prioritized for either construction of barriers, renovation work, or both depending on the time, manpower, and funds available.

Streams should be set up on a regular maintenance schedule once the initial renovation work is completed. The streams should be visited at a determined time interval (probably on a yearly basis, at least at first) and as many rainbow trout removed as possible, with effort primarily concentrated on the larger, more harmful rainbow trout as suggested by Whitworth (1980). Concurrent with rainbow trout removal, brook trout should be moved into the renovated area. These fish could be brought down from the upper stream or translocated from other area brook trout streams.

In cases when renovation of a stream is impossible or impractical brook trout may possibly be used for translocation to renovated

streams or for establishing populations in other streams devoid of trout. There are many such instances where good trout habitat exists above natural barriers but no trout species occur. Moving brook trout from one stream to another brook trout stream would also be beneficial by increasing the gene pool and genetic variability. Inbreeding of brook trout populations may be a partial cause of the small size of native brook trout.

Translocating brook trout from one stream to another in order to establish a new population may be a valuable alternative to raising hatchery progeny of the native brook trout. Raising the native strain fish in a hatchery situation has proved somewhat difficult and unsuccessful (Wilkins 1961; Lennon 1967). Dr. Jerry Nagel of East Tennessee State University is presently engaged in establishing such a population from translocated fish in Briar Creek in Washington County, Tennessee. He plans to initiate a long term study on brook/rainbow trout interaction and evaluate the possibility of establishing a viable brook trout population by this method. Results of his work may prove invaluable in expanding the range of the brook trout in Tennessee.

Although not quite the problem it once was, habitat deterioration is still a problem with many trout streams, especially streams on private lands. Managers should periodically monitor brook trout streams for changes in water quality and assess the impacts of forestry practices and other disturbances on brook trout populations.

Finally, brook trout streams on privately owned lands are basically out of the jurisdiction of fisheries biologists in terms of specific management. However, biologists should make attempts to

impress on private land owners the value of the brook trout resource and encourage the wise use of their lands and forests. In some cases, these brook trout populations may be good sources of fish to be translocated to other streams.

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APPENDIXES

APPENDIX A

STREAM DESCRIPTIONS

Table 6. List of streams that currently have brook trout populations, that had brook trout in the late 1960's, or have undergone renovation efforts to re-establish brook trout.

Stream Reference Number[a]	Drainage, River System, Watershed, and Stream[b]
	Mobile Basin Drainage:
	Conasauga River System:
	Jacks River Watershed:
	Beech Creek
001	East Fork
	Tennessee River Drainage:
	Hiwassee River System:
	Ocoee River Watershed:
	Brush Creek
	Belcher Creek
002	Johnson Creek
	Little Tennessee River System:
	Tellico River Watershed:
003	Bald River (Headwaters)
004	Kirkland Creek
005	Henderson Branch
006	Brookshire Creek
	North River
007	Meadow Branch
008	Roaring Branch
009	Sycamore Creek
010	Rough Ridge Creek
	Citico Creek Watershed:
	South Fork Citico Creek
011	Falls Branch

Table 6. Continued.

Stream Reference Number[a]	Drainage, River System, Watershed, and Stream[b]
	Tennessee River Drainage: (Continued)
	Little River System:
	Little River Watershed:
012	Little River (Headwaters)
	Middle Prong Little River
013	Spruce Flats Branch
014	Sams Creek
015	Starkey Creek
016	Lynn Camp Prong (Headwaters)
017	Marks Creek
018	Indian Flats Prong
019	Ridge Branch
020	Seng Patch Branch
021	Davis Branch
022	Meigs Creek
023	Laurel Branch
024	Tanager Branch
025	Jakes Creek
026	Newt Prong
027	Huskey Branch
028	Fish Camp Prong
029	Goshen Prong
030	Jenkins Creek
031	Left Branch
032	Double Spring Branch
033	Silers Creek
034	Narrows Branch
035	Buckeye Gap Prong
036	Small Branch
037	Shelter Spring Branch
038	Meigs Post Prong
039	Sweet Creek
040	Grouse Creek
041	Spud Town Branch
042	Rattler Branch
043	Devil Branch
044	Snake Tongue
045	Kuwahi Branch
046	Love Branch

Table 6. Continued.

Stream Reference Number[a]	Drainage, River System, Watershed, and Stream[b]
	Tennessee River Drainage: (Continued)
	French Broad River System:
	Little Pigeon River Watershed:
	West Prong Little Pigeon River
047	Dudley Creek
048	Twin Creek
	Roaring Fork
	Rocky Spur Branch
049	Bales Branch
050	Road Prong
051	Walker Camp Prong
052	Alum Cave Creek
053	Kephart Branch
	East Fork (Little Pigeon River)
054	Dunn Creek
	Webb Creek
055	Noisy Creek
056	Texas Creek
057	Rhododendron Creek
058	Porters Creek
059	False Gap Prong
060	Kalanu Prong
061	Long Branch
062	Cannon Creek
063	Lowes Creek
064	Boulevard Prong
065	Middle Prong Little Pigeon River
066	Ramsay Prong
067	Buck Fork
068	Eagle Rocks Prong
069	Laurel Top Branch
070	Copper Gap Branch
071	Pecks Branch
072	Lost Prong
073	Chapman Prong
074	Sequoyah Branch

Table 6. Continued.

Stream Reference Number[a]	Drainage, River System, Watershed, and Stream[b]
	Tennessee River Drainage: (Continued)
	French Broad River System: (Continued)
	Pigeon River Watershed:
075	Cosby Creek
076	Indian Camp Creek
077	Otter Creek
078	Copperhead Branch
079	Toms Creek
080	Sunup Branch
081	Panther Branch
082	Rock Creek
083	Little Rock Creek
084	Middle Branch
085	Camel Hump Creek
086	Dry Branch
	Gulf Fork Big Creek Watershed:
	Trail Fork Big Creek
087	Dry Fork
088	Middle Prong Gulf Creek
089	Brown Gap Creek
	Paint Creek Watershed:
090	Little Paint Creek
	Nolichucky River Watershed:
	Camp Creek
	Water Fork
091	Jennings Creek
092	Round Knob Branch
093	Dry Creek
094	Davis Creek
095	West Fork
096	Phillips Hollow

Table 6. Continued.

Stream Reference Number[a]	Drainage, River System, Watershed, and Stream[b]
	Tennessee River Drainage: (Continued)
	French Broad River System: (Continued)
	Nolichucky River Watershed: (Continued)
	Horse Creek
097	Squibb Creek
098	Turkeypen Cove
099	Sarvis Cove
100	Cassi Creek
101	East Fork
102	Middle Fork
103	West Fork Cassi Creek
104	Painter Creek
	Clark Creek
	Sill Branch
105	North Fork Sill Branch
106	South Fork Sill Branch
107	Devil Fork
108	Longarm Branch
109	Chigger Branch
	Dry Creek
110	Briar Creek
111	Broad Shoal Creek
112	California Creek
	North Indian Creek
	Rock Creek
113	Right Prong Rock Creek
114	Dick Creek
115	Rocky Branch
116	Red Fork
117	Clear Fork
	South Indian Creek
118	Granny Lewis Creek
119	Big Branch
120	Higgins Creek
121	Birchfield Camp Branch
	Spivey Creek
122	Coffee Ridge Creek
123	Watts Branch
124	Rocky Fork
125	Long Branch

Table 6. Continued.

Stream Reference Number[a]	Drainage, River System, Watershed, and Stream[b]
	Tennessee River Drainage: (Continued)
	French Broad River System: (Continued)
	Nolichucky River Watershed: (Continued)
	South Indian Creek (Continued)
	Rocky Rock (Continued)
126	Flint Creek
127	Blockstand Creek
128	Broad Branch
129	Fort Davie Creek
130	Devil Fork
131	Rice Creek
132	Jones Branch
	Holston River System:
	Watauga River Watershed:
133	Doe River (Headwaters)
134	Laurel Fork
135	Little Laurel Fork
136	Firescald Branch
137	Leonard Branch
138	Wagner Branch
139	Moreland Branch
140	White Rocks Branch
141	Bunton Branch
142	Cook Branch
143	Camp Fifteen Branch
144	Bitter End Branch
145	Camp Ten Branch
146	Hays Branch
	Little Doe River
	Simerly Creek
	Sally Cove Creek
147	Clarke Creek
148	Tiger Creek
149	Roberts Hollow
150	Bill Creek
151	Fall Branch
152	Ruins Branch
	Roaring Creek
153	No-Name Creek

Table 6. Continued.

Stream Reference Number[a]	Drainage, River System, Watershed, and Stream[b]
	Tennessee River Drainage: (Continued)
	Holston River System: (Continued)
	Watauga River Watershed: (Continued)
	Doe River (Continued)
154	George Creek
155	Heaton Creek
156	Toms Branch
157	Five Poplar Branch
158	Middle Branch
159	Right Prong Middle Branch
160	Panther Branch
161	Cove Creek
162	Little Cove Creek
163	Duck Branch
164	Stony Creek
165	Little Stony Creek
166	North Fork Stony Creek
167	Pole Branch
	Roan Creek
	Doe Creek
168	Campbell Creek
169	Mill Creek
170	Vaught Creek
171	Furnace Creek
172	East Fork
	Town Creek
173	Furnace Creek
	Goose Creek
174	Corn Creek
175	Cress Branch
	Forge Creek
176	Payne Hollow
	Elk River
	Black Branch
177	Row Branch
178	Heaton Branch
179	Little Laurel Branch
180	Morgan Branch

Table 6. Continued.

Stream Reference Number[a]	Drainage, River System, Watershed, and Stream[b]
	Tennessee River Drainage: (Continued)
	Holston River System: (Continued)
	South Fork Holston River Watershed:
181	Fishdam Creek
182	Big Jacob Creek
183	Little Jacob Creek
	Harpers Creek
184	Unnamed Tributary
185	Unnamed Tributary
186	Rockhouse Run
	Laurel Creek
	Beaverdam Creek
187	Reservoir Branch
188	Tank Hollow
189	Stillhouse Branch
190	Chalk Branch
191	Maple Branch
192	Haunted Hollow
193	Fagall Branch
194	Birch Branch
195	Old Road Branch
196	Parks Branch
197	Marshall Branch
198	Heaberlin Branch
199	Johnson Blevins Branch
200	McQueen Branch
201	Ledford Branch
202	Jim Wright Branch
203	East Fork Beaverdam Creek
	Whitetop Laurel Creek
204	Valley Creek
205	Richardson Branch
206	Lyons Branch
207	Gentry Creek
208	Grindstone Branch
209	Kate Branch
210	Gilbert Branch
211	Hoot Owl Hollow
212	Flatwood Branch
213	Corum Branch

Table 6. Continued.

Stream Reference Number[a]	Drainage, River System, Watershed, and Stream[b]

[a]Reference number for stream descriptions.

[b]Streams in successive order as they occur in the drainage system from south to north.

001 East Fork (Beech Creek)

Map Location: Hemp Top Quadrangle (127-NE) and Caney Creek Quadrangle (126-SE). This stream is a tributary to Jacks River. Its headwaters begin on the southwest side of Big Frog Mountain in Polk County, Tennessee and flows southwest into Fannin County, Georgia. Most of the stream, 2.4 km (1.5 mi), is on the Ocoee Wildlife Management Area of the Cherokee National Forest in Polk County, Tennessee.

Ownership Pattern: The entire 2.9 km (1.8 mi) of stream is on Forest Service land.

Elevation:
Mouth - 532 m (1,745 ft)
Head - 1,085 m (3,560 ft)

Aspect: Southwest

Stream Size:
Average Width - 1.5 m (5.0 ft)
Width Varies - 0.3 to 2.4 m (1.0 to 8.0 ft)
Depth - 15.2 cm (6.0 in)
Average Pool Depth - 0.5 m (1.5 ft)
Average Riffle Depth - 5.1 m (2.0 in)
Velocity - 0.03 meter per second (1.0 foot per second)

Percent Grade: 19.1%

Barriers: Not Recorded

Water Quality: (Determined 17 October 1979 at junction of East and West Forks of Beech Creek):
pH - 6.8
Conductivity - 20 umhos/cm
Temperature - 8°C (47°F)
Siltation - very light

Sources of Pollution: None

Other Fish Species Present:
Rainbow trout (*Salmo gairdneri*)
Creek chub (*Semotilus atromaculatus*)

Fish Collected: October 1979 by Abbott
Number of Rainbow Trout Greater Than 100 mm: 19
Number of Rainbow Trout Less Than 100 mm: 11

Stream Conditions: There is good cover for fish in over 60% of the stream, and about 50% of the stream is estimated to be in pools. Undercut banks and large boulders also provide good cover for fish. The stream bottom is composed of 10% fine gravel, 10% coarse gravel, 30% small rubble, 15% large rubble, 20% boulders, and 15% bedrock. Siltation is very light.

Vegetative Conditions: The streambank has 100% of overstory vegetation made up predominantly of oaks (Quercus spp.) and hemlock (Tsuga canadensis).

Discussion: This stream is only mentioned here because brook trout may still exist in its headwaters (Abbott 1980). However, this has not been documented to this date. The TWRA (1969d) stream survey report listed rainbow trout and redeye bass (Micropterus coosae) as the primary species present in East Fork Beech Creek. In 1971, 21 brook trout were collected at the junction of East and West Forks of Beech Creek (Tennessee Wildlife Resources Agency survey). However, only rainbow trout were collected at the same spot in 1979 (Abbott 1980). Rainbow trout have been stocked on the Georgia side of the stream and are firmly established.

002 Johnson Creek

Map Location: Ducktown Quadrangle (133-SW). This stream is a tributary to Belcher Creek. Its headwaters begin on the south side of Little Frog Mountain near Sassafras Knob in Polk County, Tennessee.

Ownership Pattern: The lower 1.8 km (1.1 mi) of stream is on private land, and the remaining 2.1 km (1.3 mi) is on Forest Service land.

Elevation:
Mouth - 486 m (1,595 ft)
Head - 805 m (2,640 ft)

Aspect: Southeast

Stream Size: (Determined in November 1979 at about 549 m - 1,800 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 21.3 cm (8.4 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.12 (4.0 CFS)
Water Level Conditions - slightly high

Percent Grade: 8.2%

Barriers:

1. Cascades; approximately 1.8 m (6.0 ft) vertical height at about 500 m (1,640 ft) elevation.
2. Two barriers exist on Forest Service land, but elevation location is not recorded.

Water Quality: (Determined 11 August 1976 by TWRA stream survey):

pH - 5.4
Dissolved Oxygen - 10 ppm
Hardness - 10 ppm
Total Alkalinity - 8 ppm
Temperature - 18°C (64°F)
Total Acidity - 0 ppm
Free Acidity - 8 ppm
Carbon Dioxide - 4 ppm
Sulfate - 1 ppm
Manganese - 0 ppm
Iron - 0 ppm

(Determined 26 June 1979):
pH - 6.5
Dissolved Oxygen - 10 ppm
Hardness - 10 ppm
Alkalinity - 10 ppm
Temperature - 16°C (60°F)
Siltation - very low

(Determined 18 November 1979 at about 549 m - 1,800 ft elevation):
pH - 5.9
Conductivity - 25 umhos/cm
Temperature - 6°C (42°F)

Sources of Pollution: Possible Anakeesta leachates from formations in the Little Frog Mountain area.

Other Species Present:

Minnows (Cyprinid spp.) - found in lower stream only.
No other fish species present.
A fair benthic microinvertebrate population was observed.
Salamanders (Ambystoma spp.)

Stream Conditions: On Forest Service land, there is an overall mixture of pools and riffles of about 70%. Riffle areas make up approximately 50% of the stream while about 35% is made up of pools, 5% in flats, and the remaining 10%

is in cascades or bedrock areas. The stream bottom is composed of 15% small gravel, 30% in gravel, 40% in rubble, and 15% boulders. Several pools below cascades are 1.2 m (4.0 ft) deep and have extensive undercut banks. The stream on private land is mainly fine gravel and sand with very little siltation.

Vegetative Conditions: On Forest Service land, the streambank has approximately 95% of overstory and understory vegetation made up predominantly of oak (Quercus spp.), maple (Acer spp.), rhododendron (Rhododendron spp.), and hazel alder (Alnus serrulata). About 5% of the stream has only alder and rhododendron understory and no overstory. The stream is more open in the lower section on private land.

Discussion: A TWRA stream survey in 1976 reported brook trout along with rainbow trout (Salmo gairdneri), brown trout (Salmo trutta), and creek chub (Semotilus atromaculatus) from a section of Johnson Creek on private land. Whitworth and Strange (1979) and Abbott (1979) found no trout species present, and only a few minnows were found in the lower section of the stream. Water quality is apparently a severely limiting factor and the stream is questionable trout habitat (or other fish species). No trout management is suggested other than verifying the source of possible acid rocks in the drainage. The absence of fish may be due to leachates from Anakeesta formations in the Little Frog Mountain area.

003 Bald River (Headwaters)

Map Location: Bald River Falls Quadrangle (140-SW) and Big Junction Quadrangle (140-SE). This stream is a tributary to the Tellico River. Its headwaters begin just south of Sugar Mountain Lead. It is located within the Tellico Wildlife Management Area in Monroe County, Tennessee.

Ownership Pattern: The entire 16.6 km (10.3 mi) of stream is on Forest Service land.

Elevation:
Mouth - 411 m (1,350 ft)
Head - 1,119 m (3,670 ft)

Aspect: Northwest

Stream Size: (Determined in August 1978 at about 707 m - 2,320 ft elevation):
Width - 1.5 m (4.0 ft)
Depth - 7.6 cm (3.0 in)
Velocity - 0.4 meter per second (1.3 foot per second)
Cubic Meters Per Second - 0.04 (1.3 CFS)
Water Level Conditions - normal

Percent Grade: 4.3%

Barriers: (Above confluence with Brookshire Creek)
1. Falls; at about 695 m (2,280 ft) elevation.

Water Quality: (Determined 26 August 1969 by TWRA stream survey):
pH - 6.1
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 13 ppm

(Determined 2 August 1978 at 671 m - 2,200 ft elevation):
pH - 6.3
Conductivity - 0.15 umhos/cm
Temperature - 16°C (61°F)
Siltation - medium

Sources of Pollution: Some siltation from stream bank erosion.

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: August 1978 by Barb
Number of Brook Trout Greater Than 100 mm: 40
Number of Brook Trout Less Than 100 mm: 39
Number of Rainbow Trout Greater Than 100 mm: 20
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: There is an overall mixture of pools and riffles of about 95%. Riffle areas make up approximately 40% of the stream while about 40% is made up of pools, 5% in flats, and the remaining 15% is in cascades or bedrock areas. Overall the gradient is slight and siltation is about medium throughout.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), yellow birch (Betula alleghaniensis), maple (Acer spp.), and rhododendron (Rhododendron spp.).

Discussion: Shields (1951) in his survey of east Tennessee trout streams listed Bald River headwaters (above confluence with Brookshire Creek) as supporting a nice population of native brook trout. Some stream reared brook trout up to 304.8 mm (12.0 in) were collected. He also stated that a few rainbow trout were found, but that they did not appear to be reproducing. A recent Forest Service Survey (Barb 1978) found a healthy, reproducing population of brook trout still present in the headwaters of Bald River. No hatchery reared brook trout have ever been stocked in the stream (L. Price Wilkins, personal communication).

An allopatric brook trout population exists from the falls just above the confluence with Brookshire Creek for about 3.5 km (2.2 mi) into the headwaters. Below the falls, a sympatric brook/rainbow trout population exists for about 0.3 km (0.2 mi). This stream appears to have excellent conditions for brook trout, and no extraordinary management is suggested other than protection of the stream. Thirty-three brook trout from Bald River were transplanted in Brookshire Creek during the renovation of Brookshire Creek in October 1982.

004 Kirkland Creek

Map Location: Bald River Falls Quadrangle (140-SW). This stream is a tributary to Bald River. Its headwaters begin on the northeast side of the Unicoi Mountains near Sandy Gap in Monroe County, Tennessee.

Ownership Pattern: The entire 5.5 km (3.4 mi) of stream is on Forest Service land.

Elevation:
Mouth - 573 m (1,880 ft)
Head - 770 m (2,525 ft)

Aspect: Northeast

Stream Size: (Determined in November 1981 at 573 m - 1,880 ft elevation):
Width - 5.2 m (17.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.6 meter per second (2.0 feet per second)
Cubic Meters Per Second - 0.34 (11.3 CFS)
Water Level Conditions - moderately low to normal

Percent Grade: 3.6%

Barriers: None

Water Quality: (Determined 26 August 1969 by TWRA stream survey):
pH - 6.3
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 6 ppm

(Determined 3 November 1981 at 573 m - 1,880 ft elevation):
Siltation - light

Sources of Pollution: None

Other Species Present:
Rainbow trout (Salmo gairdneri)
Creek chub (Semotilus atromaculatus)
Stoneroller (Campostoma anomalum)
Blacknose dace (Rhinichthys atratulus)

Fish Collected: November 1981 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 24
Number of Rainbow Trout Less Than 100 mm: 6

Stream Conditions: There is about 25% of the stream that provides high quality habitat. Riffle areas make up approximately 40% of the stream while about 15% is made up of pools, 20% in flats, and the remaining 25% is in cascades or bedrock areas. The stream bottom is composed of sand, gravel, rock, boulders, and bedrock. Bedrock becomes more prevalent in the middle section of the stream. Pool development is not very good, and siltation is light.

Vegetative Conditions: The streambank has approximatley 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), birch (Betula spp.), oak (Quercus spp.), and rhododendron (Rhododendron spp.). Rhododendron becomes snarled and tangled in the upper portion of Kirkland Creek.

Discussion: The TWRA (1969c) stream survey report listed brook trout along with rainbow trout as the primary species present in Kirkland Creek. However, Elsen (1981) found only rainbow trout present in the stream. The stream is small to medium size and cover for fish is somewhat lacking. It presently has a wild, reproducing population of rainbow trout throughout its length. Therefore, it probably has no future potential for brook trout management.

005 Henderson Branch

Map Location: Bald River Falls Quadrangle (140-SW) and Big Junction Quadrangle (140-SE). This stream is a tributary to Bald River. Its headwaters begin on the west side of Sugar Mountain just south of Maple Camp Lead. It is located within the Tellico Wildlife Management Area in Monroe County, Tennessee.

Ownership Pattern: The entire 5.0 km (3.1 mi) of stream is on Forest Service land.

Elevation:
Mouth - 582 m (1,910 ft)
Head - 905 m (2,970 ft)

Aspect: West

Stream Size: (Determined in June 1978 at 582 m - 1,910 ft. elevation):
Width - 0.9 m (3.0 ft)
Depth - 7.6 cm (3.0 in)
Velocity - 0.3 meter per second (1.1 foot per second)
Cubic Meters Per Second - 0.03 (0.9 CFS)
Water Level Condition - low

Percent Grade: 6.5%

Barriers:
1. Man-made; concrete barrier near 628 m (2,060 ft) elevation.
2. Falls; at about 686 m (2,250 ft) elevation.

Water Quality: (Determined 26 August 1969 by TWRA stream survey.
pH - 6.2
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 6 ppm
Temperature - 19°C (65°F)

(Determined 10 June 1978 at 634 m - 2,080 ft elevation):
pH - 6.4
Conductivity - 0.95 umhos/cm
Temperature - 18°C (64°F)
Siltation - medium

Sources of Pollution: Siltation from Bald River road.

Other Species Present:
Rainbow trout (Salmo gairdneri)
Mayflies (Ephemeroptera)
Caddisflies (Trichoptera)
Crayfish and salamanders

Fish Collected: June 1978 by Barb
Number of Brook Trout Greater Than 100 mm: 49
Number of Brook Trout Less Than 100 mm: 7
Number of Rainbow Trout Greater Than 100 mm: 10
Number of Rainbow Trout Less Than 100 mm: 2

Stream Conditions: There is an overall mixture of pools and riffles of about 70%. Riffle areas make up approximately 40% of the stream while about 35% is made up of pools, 20% in flats, and the remaining 5% is in cascades or bedrock areas. Some areas in the lower two-thirds of the stream have heavy siltation in the pools.

Vegetative Conditions: The streambank has approximately 100% of overstory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), yellow birch (Betula alleghaniensis), maple (Acer spp.), and oaks (Quercus spp.).

Discussion: Shields (1951) in his survey of east Tennessee trout streams listed Henderson Branch as a fine nursery stream with a fair population of rainbow trout. He did not report on the presence of absence of brook trout at that time. However, L. Price Wilkins (personal communication) stated that native brook trout were present then. The TWRA (1969c) stream survey report listed brook trout as the primary species present and the recent Forest Service survey (Barb 1978) found brook trout present along with an invading rainbow trout population. A sympatric brook/rainbow trout population was found from 628 m (2,060 ft) elevation up to about 686 m (2,250 ft) elevation where a natural falls apparently is a barrier. Only brook trout were found above the falls for another 1.0 km (0.6 mi).

The stream was renovated in June 1969 with rotenone, however, the removal was incomplete and rainbow trout are still present. During renovation, 37 native brook trout from Johnson Blevins Branch in Johnson County were transported to Henderson Branch and stocked in the stream. Although rainbow trout are present, brook trout appear to dominate (L. Price Wilkins, personal communication). Also, 65 brook trout from Henderson Branch were transplanted in Brookshire Creek during renovation of Brookshire Creek in October 1982. Management efforts should be targeted at pro-

tection of the brook trout population along with possible rainbow trout removal efforts.

006 Brookshire Creek

Map Location: Bald River Falls Quadrangle (140-SW) and Unaka Quadrangle (141-NW). This stream is a tributary to Bald River. Its headwaters begin near Sled Runner Gap, and it is located within the Tellico Wildlife Management Area in Monroe County, Tennessee.

Ownership Pattern: The entire 4.7 km (2.9 mi) of stream is on Forest Service land.

Elevation:
Mouth - 684 m (2,245 ft)
Head - 1,132 m (3,715 ft)

Aspect: North

Stream Size: (Determined in June 1978 at 774 m - 2,440 ft elevation):
Width - 2.4 m (8.0 ft)
Depth - 15.2 cm (6.0 in)
Velocity - 0.4 meter per second (1.3 foot per second)
Cubic Meters Per Second - 0.15 (5.0 CFS)
Water Level Conditions - high

Percent Grade: 9.6%

Barriers:
1. Falls; near the mouth, at about 686 m (2,250 ft) elevation
2. Falls; at about 939 m (3,080 ft) elevation

Water Quality: (Determined 26 August 1969 by TWRA stream survey):
pH - 6.3
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 6 ppm
Temperature - 19°C (67°F)

(Determined 10 June 1978 at 774 m - 2,440 ft elevation):
pH - 6.3
Conductivity - 15 umhos/cm
Tempretaure - 14°C (57°F)
Siltation - slight

Sources of Pollution: Some siltation from streambank erosion.

Other Species Present:
Rainbow trout (Salmo gairdneri)
Stoneflies (Plecoptera)
Mayflies (Ephemeroptera)
Caddisflies (Trichoptera)
Salamanders and crayfish

Fish Collected: June 1978 by Barb
Number of Rainbow Trout Greater Than 100 mm: 115
Number of Rainbow Trout Less Than 100 mm: 11

Stream Conditions: There is an overall mixture of pools and riffles of about 90%. Riffle areas make up approximately 40% of the stream while about 40% is made up of pools, 5% in flats, and the remaining 15% is in cascades or bedrock areas. The overall gradient is slight and the stream bottom is clean with little or no siltation.

Vegetative Conditions: The streambank has approximately 100% overstory vegetation made up predominantly of hemlock (Tsuga canadensis), maple, (Acer spp.), American sycamore (Platanus occidentalis), and yellow poplar (Liriodendron tulipifera). About 2% of the stream has bare or actively eroding banks.

Discussion: Brookshire Creek was known to have had pure brook trout in the headwaters in the 1930's (L. Price Wilkins, personal communication). However, Shields (1951) reported that this one time favorite brook trout stream was now invaded to its head by rainbow trout. The TWRA (1969c) stream survey report listed that brook trout along with rainbow trout were still present in the stream. But a recent Forest Service survey (Barb 1978) found only rainbow trout present in the stream. The rainbow trout apparently out-competed and replaced the brook trout population.

Plans for stream renovation of Brookshire Creek by electroshocking and cresol treatment were initiated. Rainbow trout above a natural falls barrier near the mouth of Brookshire Creek were to be removed and brook trout from Bald River were to be transplanted in the stream. Actual renovation took place in September and October 1982 by TWRA and Forest Service personnel. A total of 624 rainbow trout were removed and 33 brook trout from Bald River and 65 brook trout from Henderson Branch were transplanted to Brookshire Creek.

A recent follow-up survey found 3 or 4 brook trout present; one rainbow trout was also found (L. Price Wilkins, personal communication). Future management strategies should be targeted at monitoring brook trout survival and continued rainbow trout removal efforts.

007 Meadow Branch

Map Location: Big Junction Quadrangle (140-SE). This stream is a tributary to North River. Its headwaters begin northwest of Johns Knob near Stratton Gap. It is located within the Tellico Wildlife Management Area in Monroe County, Tennessee.

Ownership Pattern: The entire 5.0 km (3.1 mi) of stream is on Forest Service land.

Elevation:
Mouth - 701 m (2,300 ft)
Head - 1,244 m (4,080 ft)

Aspect: Southwest

Stream Size: (Determined in February 1978 at 884 m - 2,900 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 15.2 cm (6.0 in)
Water Level Conditions - high

Percent Grade: 10.9%

Barriers:
1. Falls; above the mouth of Roaring Branch at about 948 m (3,110 ft) elevation

Water Quality: (Determined 26 August 1969 by TWRA survey):
pH - 6.8
Dissolved Oxygen - 11 ppm
Hardness - 34 ppm
M.O. Alkalinity - 20 ppm
Temperature - 19°C (67°F)

(Determined 1 February 1978 at 884 m - 2,900 ft elevation):
pH - 6.4
Conductivity - 0.5 umhos/cm
Temperature - 11°C (52°F)
Siltation - heavy in lower section of stream

Sources of Pollution: Siltation from North River road.

Other Fish Species Present: Rainbow trout (*Salmo gairdneri*)

Fish Collected: February and June 1979 by Barb
Number of Brook Trout Greater Than 100 mm: 9
Number of Brook Trout Less Than 100 mm: 0
Number of Rainbow Trout Greater Than 100 mm: 45
Number of Rainbow Trout Less Than 100 mm: 49

Stream Conditions: There is an overall mixture of pools and riffles of about 85%. Riffle areas make up approxiamtely 40% of the stream while about 40% is made up of pools, 5% in flats, and the remaining 15% is in cascades of bedrock areas. The overall stream gradient is slight to steep. Siltation is heavy in the lower section of the stream adjacent to North River road.

Vegetative Conditions: The streambank has approxiamtely 100% overstory and understory vegetation made up predominantly of American beech (Fagus grandifolia); yellow poplar (Liriodendron tulipifera), yellow birch (Betula alleghaniensis), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.).

Discussion: The TWRA (1969c) stream survey report listed rainbow trout and brown trout (Salmo trutta) as the primary species present in Meadow Branch. However, L. Price Wilkins (personal communication) stated that the stream also had a remnant brook trout population in the headwaters at that time. Meadow Branch was renovated in July and October 1958 using cresol. Approximately 4.8 km (3.0 mi) of stream (including tributaries) above a natural barrier were treated with 3 applications of cresol to remove rainbow trout. The stream was stocked in the fall of 1959 with 200 southern strain brook trout about 203.2 to 254.0 mm (8.0 to 10.0 in) in length. Brook trout were well established a year later and the stream was reopened to fishing in 1961 (Wilkins 1961).

The rainbow trout removal effort in the late 1950's was incomplete (L. Price Wilkins, personal communication) and Barb (1978) found about 1.8 km (1.1 mi) of sympatric brook/rainbow trout water beginning at about 988 m (3,240 ft) elevation and going up to about 1,146 m (3,760 ft) elevation. Continued rainbow trout removal efforts should be included in the future management of this stream for brook trout.

008 Roaring Branch

Map Location: Big Junction Quadrangle (140-SE). This stream is a tributary to Meadow Branch which is a tributary to North River. Its headwaters begin southwest of Little Haw Knob near Whigg Meadow. It is located within the Tellico Wildlife Management Area in Monroe County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on Forest Service land.

Elevation:
Mouth - 943 m (3,095 ft)
Head - 1,460 m (4,790 ft)

Aspect: Northwest

Stream Size: (Determined in June 1978 at 945 m - 3,095 ft elevation):
Width - 3.0 m (10.0 ft)
Depth - 15.2 cm (6.0 in)
Velocity - 0.3 meter per second (1.1 foot per second)
Cubic Meters Per Second - 0.17 (5.6 CFS)
Water Level Conditions - normal

Percent Grade: 24.7%

Barriers:
1. Falls; just above the mouth at about 948 m (3,110 ft) elevation.
2. Falls; at about 969 m (3,180 ft) elevation.
3. Falls; at about 1,024 m (3,360 ft) elevation.
4. Falls; at about 1,134 m (3,720 ft) elevation.

Water Quality: (Determined 26 August 1969 by TWRA stream survey):
pH - 6.4
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 13 ppm
Temperature - 19°C (66°F)

(Determined 15 June 1978 at 951 m - 3,120 ft elevation):
pH 6.4
Conductivity - 13 umhos/cm
Temperature - 12°C (54°F)
Siltation - light

Sources of Pollution: Siltation from the Sycamore Road upstream.

Other Fish Species Present: Rainbow trout (*Salmo gairdneri*)

Fish Collected: June 1978 by Barb
Number of Brook Trout Greater Than 100 mm: 9
Number of Brook Trout Less Than 100 mm: 1
Number of Rainbow Trout Greater Than 100 mm: 3
Number of Rainbow Trout Less Than 100 mm: 3

Stream Conditions: There is an overall mixture of pools and riffles of about 30%. Riffle areas make up approximately 20% of the stream while about 40% is in pools, no flats, and the remaining 40% is in cascades or bedrock areas. There are few riffles, the stream is mostly cascades and bedrock with scattered pools. Siltation is light, but there is a lot of debris in the stream. The overall gradient is fairly steep.

Vegetative Conditions: The streambank has approximately 100% overstory and understory vegetation made up predominantly of American beech (Fagus grandifolia) yellow poplar (Liriodendron tulipifera), yellow birch (Betula alleghaniensis), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.).

Discussion: Roaring Branch has a history of fire damage that occurred in the mid 1920's and left it devoid of fish. The stream recovered and by 1955 it could provide good habitat conditions. In August, 1955 it was stocked with 300 Pisgah strain brook trout 76.2 to 101.6 mm (3.0 to 4.0 in) long. The Pisgah strain fish were progeny of brook trout brood stock originally from streams on the Pisgah National Forest (North Carolina) and were supplied by the Walhalla National Hatchery (South Carolina). At the same time Big Jacob Creek (Jacob Creek) in Sullivan County, Tennessee, had a similar fire damage history and was also stocked with Pisgah strain brook trout. By fall 1955 limited natural reproduction was noted and again in 1956 another successful spawn in both Roaring Branch and Big Jacob Creek was recorded as the first Tennessee record of progeny from hatchery origin brook trout. Another 400, 177.8 mm (7.0 in) Pisgah strain brook trout were stocked in Roaring Branch in June 1958 and by 1960 the population of brook trout had increased to the point where the stream was opened to fishing. However, this early success was duly ended when a timber sale in the watershed subsequently loaded the stream bed with siltation and eliminated all but a few brook trout by the end of 1961 (Wilkins 1961).

Brook trout did survive and the TWRA (1969c) stream survey report listed brook trout as the primary species present in Roaring Branch. Recent Forest Service surveys (Barb 1978) also found brook trout along with a few rainbow trout still present in the stream. Brook trout were found from about 981 m (3,220 ft) elevation up to about 1,134 m (3,720 ft) elevation and the stream has approximately 0.8 km (0.5 mi) of allopatric brook trout water in the lower stream and about 0.2 km (0.1 mi) of sympatric brook/rainbow trout in the headwaters. This situation is different from the normal in that sympatric zones usually occur in the lower stream and allopatric zones occur in the upper stream. Probably what has happened is that rainbow trout have been stocked from Whigg Road that crosses Roaring Branch at about 1,134 m (3,270 ft) elevation.

This stream may prove a good candidate for future stream renovation efforts and brook trout range extension. Barb (1978) stated that the stream has seemingly isolated areas where trout occur and that the stream has a low number of rainbow trout, however, the rainbow trout are reproducing. Therefore, rainbow trout removal efforts may be necessary if the brook trout population is to survive.

009 Sycamore Creek

Map Location: Big Junction Quadrangle (140-SE). This stream is a tributary to Tellico River. Its headwaters begin northwest of Big Junction. It is located within the Tellico Wildlife Management Area in Monroe County, Tennessee.

Ownership Pattern: The entire 6.9 km (4.3 mi) of stream is on Forest Service land.

Elevation:
Mouth - 637 m (2,090 ft)
Head - 1,445 m (4,740 ft)

Aspect: Southwest

Stream Size:
Cubic Meters Per Second - 0.07 (2.3 CFS)

Percent Grade: 11.7%

Barriers: Not Recorded

Water Quality: (Determined 26 August 1969 by TWRA stream survey):
pH - 6.5
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 13 ppm
Temperature - 20°C (68°F)
Siltation - light

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Stream Conditions: Approximately 25% of the stream is estimated to be in pools.

Vegetative Conditions: The local watershed has 100% timber.

Discussion: Shields (1951) reported that rainbow trout had almost eliminated brook trout from Sycamore Creek at that time, and the TWRA (1969c) stream survey report listed only rainbow trout as the primary fish species present in the stream.

The stream for now has rainbow trout, and is only mentioned here because of efforts made to establish brook trout. The stream has never had any trout in above a falls (location not recorded) in the headwaters. It was stocked in the spring

of this year (1984) with Owhi strain hatchery brook trout fingerlings above the falls (L. Price Wilkins, personal communication).

010 Rough Ridge Creek

Map Location: Big Junction Quadrangle (140-SE). This stream is a tributary to Tellico River. Its headwaters begin on the west side of State Ridge, southwest of Grassy Top. It is within the Tellico Wildlife Management Area in Monroe County, Tennessee.

Ownership Pattern: The entire 4.8 km (3.0 mi) of stream is on Forest Service land.

Elevation:
Mouth - 786 m (2,580 ft)
Head - 1,335 m (4,380 ft)

Aspect: Southwest

Stream Size: (Determined in June 1978 at about 808 m - 2,650 ft elevation):
Width - 5.6 m (15.0 ft)
Depth - 15.2 cm (6.0 in)
Velocity - 0.5 meter per second (1.7 foot per second)
Cubic Meters Per Second - 0.24 (8.0 CFS)
Water Level Conditions - little high

Percent Grade: 11.4%

Barriers:
1. Falls; at about 823 m (2,700 ft) elevation.
2. Natural falls with man-made improvements to increase vertical height, at about 835 m (2,800 ft) elevation.

Water Quality: (Determined 26 August 1969 by TWRA stream survey):
pH - 6.3
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 6 ppm
Temperature - 20°C (68°F)

(Determined 6 June 1978 at 808 m - 2,650 ft elevation):
pH - 6.4
Conductivity - 1.05 umhos/cm
Temperature - 12°C (54°F)
Siltation - heavy in lower section

Sources of Pollution: Siltation from Rough Ridge road.

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: June 1978 by Barb
Number of Brook Trout Greater Than 100 mm: 43
Number of Brook Trout Less Than 100 mm: 9
Number of Rainbow Trout Greater Than 100 mm: 73
Number of Rainbow Trout Less Than 100 mm: 7

Stream Conditions: There is an overall mixture of pools and riffles of about 80%. Riffle areas make up approximately 45% of the stream while about 45% is in pools, no flats, and the remaining 10% is in cascades or bedrock areas. Overall the gradient is moderate. Siltation is heavy in the lower section where Rough Ridge road parallels the stream. Little siltation is present in the upper reaches.

Vegetative Conditions: The streambank has approximately 95% overstory and understory vegetation made up predominantly of birch (Betula spp.), maple (Acer spp.), yellow poplar (Liriodendron tulipifera), hemlock (Tsuga canadensis), pine (Pinus spp.), dogwood (Cornus spp.), and rhododendron (Rhododendron spp.), About 5% of the streambank has dogwood and rhododendron understory but no overstory vegetation. Some areas in the upper stream reaches have deadfalls and blowdowns that are clogging the stream.

Discussion: The TWRA (1969c) stream survey report listed rainbow trout as the primary species present in Rough Ridge Creek. However, the stream has historically always had a good population of native brook trout in the headwaters (Shields 1951; L. Price Wilkins, personal communciation). Recent Forest Service surveys (Barb 1978) found brook trout from about 890 m (2,290 ft) elevation up to about 1,158 m (3,800 ft) elevation. The stream has about 1.0 km (0.6 mi) of sympatric brook/rainbow trout water and about 1.3 km (0.8 mi) of pure brook trout found in the headwaters.

In July 1983, a natural falls at 853 m (2,800 ft) elevation was modified to increase its vertical height and a rainbow trout removal program begun. Removal efforts between 13 and 15 July, 1983 removed 219 rainbow trout. Later that year on 27 October 1983 Strange (1983) reported another 17 rainbow trout were removed from the same area. The stream is scheduled for rainbow trout removal efforts to continue in the future.

One interesting note; brook trout from Rough Ridge Creek were used by Harris et al. (1978) of Tennessee Technological

University, Tennessee Cooperative Fishery Research Unit in genetic research of brook trout from the Southern Appalachian region and by Konopacky (1978) for age and growth analysis.

011 Falls Branch

Map Location: Big Junction Quadrangle (140-SE). This stream is a tributary to the South Fork Citico Creek. Its headwaters begin on the north side of Sassafras Ridge near Beech Gap. It is located within the Tellico Wildlife Management area in Monroe County, Tennessee.

Ownership Pattern: The entire 4.5 km (2.8 mi) of stream is on Forest Service land.

Elevation:
Mouth - 881 m (2,890 ft)
Head - 1,289 m (4,230 ft)

Aspect: Northwest

Stream Size:
Average Width - 1.2 m (4.0 ft)
Average Pool Depth - 0.5 m (1.5 ft)
Average Riffle Depth - 7.6 cm (3.0 in)

Percent Grade: 9.1%

Barriers:
1. Falls; at about 957 m (3,140 ft) elevation.
2. Falls; at about 1,085 m (3,560 ft) elevation.

Water Quality: (Determined 21 August 1969 by TWRA stream survey):
pH - 6.2
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 6 ppm
Temperature - 19°C (67°F)
Siltation - light

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (*Salmo gairdneri*)

Fish Collected: August and September 1978 by Barb
Number of Brook Trout Greater Than 100 mm: 23
Number of Brook Trout Less Than 100 mm: 9
Number of Rainbow Trout Greater Than 100 mm: 12
Number of Rainbow Trout Less Than 100 mm: 4

Stream Conditions: The estimated percent of the stream in pools is about 20%. The stream bottom is composed of sand, gravel, rubble, boulders and bedrock. Siltation is light.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation.

Discussion: The TWRA (1969c) stream survey report listed rainbow trout as the primary species present in Falls Branch. However, the stream has always had a pure native brook trout population in the upper stream (L. Price Wilkins, personal communication). Recent Forest Service surveys (Barb 1978) found brook trout from about 866 m (2,840 ft) elevation up to about 1,140 m (3,740 ft) elevation. The stream has approximately 1.4 km (0.9 mi) of sympatric brook/rainbow trout up to about 1,085 m (3,560 ft) elevation where a high natural falls is a barrier to upstream movement by rainbow trout. Above this falls the stream is reported to have about 1.3 km (0.8 mi) of allopatric brook trout water.

No management is suggested other than protection of the watershed. However, the lower section of this stream may prove a good candidate for future renovation efforts and brook trout range extension.

012 Little River (Headwaters above confluence with Grouse Creek)
(East Prong, Middle Prong, and Trout Fork)

Map Location: Silers Bald Quadrangle (157-SE) and Clingmans Dome Quadrangle (165-SW). Generally referred to as the East Prong of Little River, it is a tributary to the Tennessee River (Fort Loudoun Reservoir). Only the extreme headwaters are discussed here, and they arise on the southwest side of Mount Collins near Collins Gap. This portion of the stream is located within the GSMNP in Sevier County, Tennessee.

Ownership Pattern: Total length of Little River is approximately 89.3 km (55.5 mi). Approximately 38.5 km (23.9 mi) are within the GSMNP. The portion above the confluence with Grouse Creek is 3.5 km (2.2 mi) in length.

Elevation:
Confluence with Grouse Creek - 1,026 m (3,365 ft)
Head - 1,573 m (5,160 ft)

Aspect: Northwest

Stream Size: (Determined 25 June 1974 at 1,073 m - 3,520 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 5.2 m (17.0 ft)

Percent Grade: 15.5% (above confluence with Grouse Creek)

Barriers: None Recorded (above Grouse Creek)

Water Quality: (Determined 5 August 1936 at 1,158 m - 3,800 ft elevation, from King 1937):
pH - 6.8

(Determined 25 June 1974 at 1,073 m - 3,520 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.5
Temperature - 10°C (50°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 25 June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 5
Number of Brook Trout Less Than 100 mm: 0
Number of Rainbow Trout Greater Than 100 mm: 39
Number of Rainbow Trout Less Than 100 mm: 3

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: King (1937) stated that around 1900 and prior to logging, the lower limit of native brook trout on Little River was at the mouth of Jakes Creek near Elkmont at approximately 655 m (2,150 ft) elevation. He also reported that in the mid 1930's the headwaters of the main prong of Little River contained one of the finest native brook trout populations in the Great Smokies. He later stated (King 1940) that the native brook trout was apparently well established in Little River above Fish Camp Prong.

Powers (1929) referred to this section of Little River (above Grouse Creek) as Middle Fork and stated that only the native brook trout occupied the stream in 1925 and 1926 above a zone of uncut forest and that rainbow trout occurred only below this zone in Little River and Left Fork (Meigs Post Prong). King (1937) called this section of the stream Trout

Fork and reported that the native brook trout was apparently "holding ground" but that the rainbow trout had extended its range about 0.8 km (0.5 mi) up the stream by 1935 and 1936.

Brook trout and rainbow trout were reported in Little River surveys from 1945 to 1974 (Holloway 1945; Lennon and Parker 1960; Lennon 1967; TWRA 1970b; Kelly et al. 1980; data from National Park files). Stocking records from National Park files show that 26,423 brook trout were stocked from 1936 to 1975.

Both trout species were found in the headwaters in 1974. Brook trout were found from about 1,268 m (4,160 ft) elevation up to about 1,487 m (4,880 ft) elevation. The stream has approximately 0.5 km (0.3 mi) of sympatric brook/rainbow trout and about 0.8 km (0.5 mi) of allopatric brook trout water. A few brook trout were also found in Little River above and below the mouth of Kuwahi Branch from about 1,073 m (3,520 ft) elevation to about 1,079 m (3,540 ft) elevation (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map; data from National Park files). No specific management is suggested other than monitoring the stream or possible stream renovation.

013 Spruce Flats Branch

Map Location: Wear Cove Quadrangle (157-NW). This stream is a tributary to Middle Prong Little River. Its headwaters begin near Upper Buckhorn Gap on the north side of Meigs Mountain. It is located within the GSMNP in both Blount County and Sevier County, Tennessee.

Ownership Pattern: The entire 4.3 km (2.7 mi) of stream is on National Park land.

Elevation:
Mouth - 453 m (1,485 ft)
Head - 951 m (3,120 ft)

Aspect: Southwest

Stream Size: (Determined 28 March 1969 by TWRA stream survey):
Average Width - 2.1 m (7.0 ft)
Width Varies - 0.3 to 6.1 m (1.0 to 20.0 ft)
Average Pool Depth - 0.9 m (3.0 ft)
Average Riffle Depth - 7.6 cm (3.0 in)
Cubic Meters Per Second - 0.12 (4.0 CFS)

(From Harned 1976):
Average Width - 2.3 m (7.5 ft)
Cubic Meters Per Second - 0.11 (3.8 CFS)

Percent Grade: 11.5%

Barriers:
1. Large cascades area at the mouth.
2. Falls; approximately 13.7 m (45.0 ft) vertical height; at about 475 m (1,560 ft) elevation.
3. Falls; approximately 9.1 m (30.0 ft) vertical height; at about 482 m (1,580 ft) elevation.
4. Falls; approximately 4.6 m (15.0 ft) vertical height; at about 488 m (1,600 ft) elevation.
5. Falls; approximately 8.5 m (28.0 ft) vertical height; at about 494 m (1,620 ft) elevation.

Water Quality: (Determined 6 November 1968 by TWRA stream survey):
pH - 6.4
Dissolved Oxygen - 11 ppm
Hardness - 17 ppm
M.O. Alkalinity - 13 ppm
Temperature - 8°C (46°F) on 28 March 1969

(From Harned 1976, data for 15 April and 7 November 1975):
pH - 6.7 and 7.2
Dissolved Oxygen - 10 and 12 ppm
Alkalinity - 10 ppm (both dates)
Total Hardness - 1 ppm (both dates)

Sources of Pollution: Not Recorded

Other Species Present: Blacknose dace (*Rhinichthys atratulus*)
Salamanders
Crayfish

Fish Collected: 25 July 1984 by Broadbent and Bivens
Brook Trout Average Length: 206.0 mm (8.1 in)
Brook Trout Average Weight: 104.2 g (3.7 oz)
Average K Brook Trout Greater Than 100 mm: 1.19
Number of Brook Trout Greater Than 100 mm: 6
Number of Brook Trout Less Than 100 mm: 1

Stream Conditions: There is good cover for fish in about 10% of the stream, and only about 30% of the stream is estimated to be in pools. The stream bottom is composed of about 5% silt, 10% sand, 15% gravel, 20% rubble, 25% bedrock, and 25% boulders. The lower stream is characterized by a steep con-

tinuous gradient and series of pools and riffles, while the upper stream has a lower gradient and is shallow with fewer pools. Siltation is heavy in pools in the lower stream reaches.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up of species from the pine forest, oak-hickory forest, and the cove hardwood-hemlock forest types. Predominant species include Virginia pine (Pinus virginia), flowering dogwood (Cornus florida), striped maple (Acer pennsylvanicum), red maple (Acer rubrum), yellow birch (Betula alleghaniensis), yellow poplar (Liroiodendron tulipifera), American beech (Fagus grandifolia), Fraser magnolia (Magnolia fraseri), Eastern hemlock (Tsuga canadensis), rosebay rhododendron (Rhododendron maximum), and dog hobble (Leucothoe editorum).

Discussion: The only documentation of native brook trout ever being in Spruce Flats Branch was by Burrows (1935). He reported that brook trout were found in the stream during the fall of 1934 and that lumbering operations were just beginning in the Spruce Flats Valley at that time. He considered the stream best suited for brook trout.

The stream was stocked with 1,740 brook trout in 1940. However, stream surveys in 1959 and again in 1975 found no brook trout or other trout species present in the stream (data from National Park files).

Harned (1976) used Spruce Flats Branch as a study site to evaluate the success of stocking hatchery strain and F_1 wild strain brook trout fingerlings in a stream devoid of trout species. The parent stock for the F_1 wild brook trout fingerlings were collected from Alum Cave Creek (J. Larry Wilson, personal communication) in the GSMNP in October 1974 and were reported to be some of the largest brook trout ever collected in the Park. The hatchery fingerlings were from a commercial hatchery in Brevard, North Carolina and were of the New England (Maryland) strain. A total of 497 brook trout fingerlings were stocked in Spruce Flats Branch on May 2-3, 1975. Of this total, 237 were F_1 wild fish and 260 were of hatchery strain. Both strains of fish had high mortality but more of the F_1 wild brook trout survived. Harned hoped that the surviving fingerlings would populate the stream through natural reproduction.

The stream was surveyed in July of this year (Broadbent and Bivens 1984) and progeny of Harned's study fish were found. Brook trout were collected from just above the mouth of Honey Cove Branch at about 512 m (1,680 ft) elevation up to approximately 610 m (2,000 ft) elevation and the stream has about 1.9 km (1.2 mi) of allopatric brook trout water. This dis-

tribution corresponds almost identically to Harned's study sections where the original study fish were stocked. There does not seem to be a large number of brook trout present in the stream and many of the good to excellent pools held no trout at all. However, the fish that were collected, were in good shape. Brook trout average length was 206.0 mm (8.1 in) and the coefficient of condition (K) was 1.19. Also, this year's reproduction was noted.

It is impossible to determine if the brook trout now present in Spruce Flats Branch are descendants of wild fish, hatchery fish, or cross between wild and hatchery fish. Since Harned found that the F_1 wild brook trout had better survival and because no known reproduction of New England strain hatchery fish has ever been documented in Tennessee streams, it can be speculated, however, that the brook trout now present are probably progeny of wild strain fish and at best are a cross between wild and hatchery brook trout.

Brook trout have become established in Spruce Flats Branch as a result of Harned's study and although maybe somewhat small in numbers, the population does appear viable. The stream is well protected from encroachment of other trout species by the high natural barriers near the mouth and no specific management is suggested. However, it will be of interest to monitor the population in years to come. Also, at the present time, a follow-up to Harned's study is in the discussion phase.

014 Sams Creek

Map Location: Thunderhead Mountain Quadrangle (157-SW). This stream is a tributary to Middle Prong Little River. Its headwaters begin just west of Mount Davis near Big Chestnut Bald and Sams Gap. It is located in both Blount County and Sevier County, Tennessee.

Ownership Pattern: The entire 7.1 km (4.4 mi) of stream is on National Park land.

Elevation:
Mouth - 584 m (1,915 ft)
Head - 1,475 (4,840 ft)

Aspect: Northwest

Stream Size:
Average Width - 4.0 m (13.0 ft) at 975 m (3,200 ft) elevation
Cubic Meters Per Second - varied from 0.03 to 6.18 (1.0 to 206.0 CFS)

Percent Grade: 12.6%

Barriers: 1. Falls; at about 899 m (2,249 ft) elevation.

Water Quality: (Determined 24 June 1974 at 975 m - 3,200 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.5
Temperature - 12°C (54°F)

(Determined in the summers of 1977 and 1978 from Moore et al. 1981):
pH - varied from 6.8 to 6.7
Conductivity - varied between 10 and 11 umhos/cm

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 24 June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 31
Number of Brook Trout Less Than 100 mm: 3
Number of Rainbow Trout Greater Than 100 mm: 4
Number of Rainbow Trout Less Than 100 mm: 22

Stream Conditions: The stream varies from large boulders and deep pools to intermediate boulders with medium to shallow pools.

Vegetative Conditions: The stream has approximately 100% of overstory and understory vegetation. The watershed vegetation includes second growth yellow birch (Betula alleghaniensis), sweet birch (Betula lenta), maple (Acer spp.), hemlock (Tsuga canadensis), yellow buckeye (Aesculus octandra), yellow poplar (Liriodendron tulipifera), rhododendron (Rhododendron spp.), wild hydrangea (Hydrangea arborescens), and dog hobble (Leucothoe editorum).

Discussion: The first documented survey of Sams Creek was by Burrows (1935). His party surveyed the stream in October 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

The TWRA (1970b) stream survey report listed both brook trout and rainbow trout present in the stream. Both trout species were reported in the stream in 1974. Brook trout were found from about 853 m (2,800 ft) elevation up to about 1,280 m (4,200 ft) elevation. The stream has approximately 1.6 km (1.0 mi) of sympatric brook/rainbow trout and about

1.8 km (1.1 mi) of allopatric brook trout water (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map).

Sams Creek was renovated in the summer of 1978 with a follow-up in the spring of 1979. Rainbow trout were removed by electroshocking as part of the GSMNP's Brook Trout Recovery Project. Whitworth (1979) reported that the renovation efforts removed from 90% to 99%, depending on habitat type, of the rainbow trout from the stream. The stream should be monitored in the future and a continued effort should be made to remove rainbow trout.

Sams Creek was also used by Moore et al. (1981, 1983) as a study stream for changes in standing crop of brook trout concurrent with removal of rainbow trout from GSMNP streams.

015 Starkey Creek

Map Location: Thunderhead Mountain Quadrangle (157-SW). This stream is a tributary to Sams Creek. Its headwaters begin just west of Devils Courthouse and north of Starkey Gap. It is located in both Blount County and Sevier County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on National Park land.

Elevation:
Mouth - 965 m (3,165 ft)
Head - 1,353 m (4,440 ft)

Aspect: Northwest

Stream Size:
Average Width - 3.7 m (12.0 ft)
Cubic Meters Per Second - 0.06 (2.0 CFS) in June 1978

Percent Grade: 18.6%

Barriers: None

Water Quality: (Determined 24 June 1974 at 975 m - 3,200 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.8
Temperature - 12°C (54°F)

(Determined in 1978 from Moore et al. 1981);
pH - 6.9
Conductivity - 11 umhos/cm

Sources of Pollution: Not Recorded

Other Fish Species Present: None

Fish Collected: 24 June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 19
Number of Brook Trout Less Than 100 mm: 2

Stream Conditions: Not Recorded

Vegetative Conditions: The stream has approximately 100% of overstory and understory vegetation. The watershed vegetation includes second growth yellow birch (Betula alleghaniensis), sweet birch (Betula lenta), maple (Acer spp.), hemlock (Tsuga canadensis), yellow buckeye (Aesculus octandra), yellow poplar (Liriodendron tulipifera), rhododendron (Rhododendron spp.), wild hydrangae (Hydrangae arborescens), and dog hobble (Leucothoe editorum).

Discussion: No historical data is available on this stream and it was surveyed in 1974 along with other streams in the Middle Prong Little River Watershed. An allopatric brook trout population exists from the mouth at 965 m (3,165 ft) elevation up to about 1,146 m (3,760 ft) elevation at approximately 1.3 km (0.8 mi) above the mouth (Kelly et al. 1980; Moore et al. 1981; GSMNP 1972-1977 brook trout distribution map). No natural barriers are in the stream and rainbow trout (Salmo gairdneri) occur in Sams Creek below Starkey Creek. Therefore, the stream should be monitored in the future to assess rainbow trout encroachment.

Starkey Creek was used by Moore et al. (1981, 1983) as a study stream for changes in standing crop of brook trout from GSMNP streams.

016 Lynn Camp Prong (Headwaters above confluence with Indian Flats Prong)

Map Location: Thunderhead Mountain Quadrangle (157-SW) and Silers Bald Quadrangle (157-SE). This stream is a tributary to Middle Prong Little River. Its headwaters begin on the south side of Dripping Spring Mountain. It is located in both Blount County and Sevier County, Tennessee.

Ownership Pattern: The entire 9.3 km (5.8 mi) of stream is on National Park land. The portion above the confluence with Indian Flats Prong is 4.3 km (2.7 mi) in length.

Elevation:
Mouth - 579 m (1,900 ft)
Confluence with Indian Flats Prong - 861 m (2,825 ft)
Head - 1,280 m (4,200 ft)

Aspect: West

Stream Size: (Determined 21 June 1974 at 1,036 m - 3,400 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 4.0 m (13.0 ft)

Percent Grade: 9.6% (headwaters above confluence with Indian Flats Prong)

Barriers: 1. Cascades; at about 1,127 m (3,700 ft) elevation.

Water Quality: (Determined 21 June 1974 at 1,036 m - 3,400 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.5
Temperature - 14°C (58°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 21 June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 52
Number of Brook Trout Less Than 100 mm: 9
Number of Rainbow Trout Greater Than 100 mm: 48
Number of Rainbow Trout Less Than 100 mm: 29

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of Lynn Camp Prong was by Burrows (1935). His party surveyed the stream in October 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

The stream was stocked with 2,394 brook trout in 1938 and with 10,336 rainbow trout between 1938 and 1940 (data from National Park files). Holloway (1945) stated that rainbow trout, New England strain brook trout, and native brook trout were present in Lynn Camp Prong. He reported that the New England strain brook trout were planted in the stream during

past years. Both species were reported present in the stream by Lennon and Parker (1960) and Lennon (1967). However, the TWRA (1969a) stream survey listed only rainbow trout as the primary species present.

Brook trout were reported in the stream in 1974. Brook trout were found from about 975 m (3,200 ft) elevation up to about 1,244 m (4,080 ft) elevation. The stream has approximately 1.8 km (1.1 mi) of sympatric brook/rainbow trout and about 1.6 km (1.0 mi) of allopatric brook trout water, this includes one left-hand fork, tributary in the headwaters (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map). A cascades area at about 1,127 m (3,700 ft) elevation is apparently a barrier to upstream movement of rainbow trout. The stream may be a good candidate for future stream renovation work.

017 Marks Creek

Map Location: Thunderhead Mountain Quadrangle (157-SW) and Wear Cove Quadrangle (157-NW). This stream is a tributary to Lynn Camp Prong. Its headwaters begin on the south side of Meigs Mountain. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 4.2 km (2.6 mi) of stream is on National Park land.

Elevation:
Mouth - 655 (2,150 ft)
Head - 1,109 m (3,640 ft)

Aspect: Southwest

Stream Size: (Determined in June 1974 at 701 m - 2,300 ft elevation):
Average Width - 4.9 m (16.0 ft)

Percent Grade: 10.9%

Barriers: None Recorded

Water Quality: (Determined 21 June 1974 at 792 m - 2,600 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.5
Temperature - 16°C (60°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 21 June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 2
Number of Brook Trout Less Than 100 mm: 0
Number of Rainbow Trout Greater Than 100 mm: 23
Number of Rainbow Trout Less Than 100 mm: 12

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of Marks Creek was by Burrows (1935). His party surveyed the stream in October 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

The stream was stocked with 2,240 brook trout in 1938 and with 4,000 rainbow trout in 1940 (data from National Park files). However, only rainbow trout were reported in the stream in the late 1950's (data from National Park files; Lennon and Parker 1960). The TWRA (1970b) stream survey report also listed only rainbow trout present.

Brook trout were reported in the stream in 1974. Brook trout were found from about 744 m (2,440 ft) elevation up to about 933 m (3,060 ft) elevation. The stream has approximately 1.8 km (1.1 mi) of sympatric brook/rainbow trout and only about 0.5 km (0.3 mi) of allopatric brook trout water (Kelly et al. 1980; GSMNP 1971-1977 brook trout distribution map). This stream may be a good candidate for future stream renovation work.

018 Indian Flats Prong

Map Location: Thunderhead Mountain Quadrangle (157-SW) and Silers Bald Quadrangle (157-SE). This stream is a tributary to Lynn Camp Prong. Its headwaters begin northeast of Hemlock Knob. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 3.5 km (2.2 mi) of stream is on National Park land.

Elevation:
Mouth - 861 m (2,825 ft)
Head - 1,426 m (4,680 ft)

Aspect: Northeast

Stream Size: (Determined 21 June 1974 at 902 m - 2,960 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 5.5 m (18.0 ft)

Percent Grade: 16.0%

Barriers:
1. Falls; at about 914 m (3,000 ft) elevation.
2. Falls; at about 927 m (3,040 ft) elevation.

Water Quality: (Determined 21 June 1974 at 902 m - 2,960 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.7
Temperature - 14°C (57°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 21 June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 3
Number of Brook Trout Less Than 100 mm: 1
Number of Rainbow Trout Greater Than 100 mm: 17
Number of Rainbow Trout Less Than 100 mm: 3

26 June 1980 from National Park files
Brook Trout Average Length: 156.0 mm (6.1 in)
Brook Trout Average Weight: 40.6 g (1.5 oz)
Average K Brook Trout Greater Than 100 mm: 0.89
Number of Brook Trout Greater Than 100 mm: 7
Number of Brook Trout Less Than 100 mm: 14
Rainbow Trout Average Length: 160.2 mm (6.3 in)
Rainbow Trout Average Weight: 50.4 g (1.8 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.10
Number of Rainbow Trout Greater Than 100 mm: 173
Number of Rainbow Trout Less Than 100 mm: 5

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of Indian Flats Prong was by Burrows (1935). His party surveyed the stream in October 1934 but the report did not list whether or not any trout species were found. His work did not include sampling

for fish populations in every stream surveyed.

The stream was stocked with 840 brook trout in 1938, and brook trout were present in the stream in the late 1950's (data from National Park files).

Brook trout were reported in the stream in 1974. Brook trout were found from about 884 m (2,900 ft) elevation up to about 1,219 m (4,000 ft) elevation. The stream has approximately 0.5 km (0.3 mi) of sympatric brook/rainbow trout and about 2.1 km (1.3 mi) of allopatric brook trout water, this includes one right-hand fork tributary in the headwaters (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map; data from National Park files). Two waterfalls check the upstream movement of rainbow trout.

019 Ridge Branch

Map Location: Thunderhead Mountain Quadrangle (157-SW). This stream is a tributary to Indian Flats Prong that has no name on the quadrangle map. I have listed it as Ridge Branch in order to separate the brook trout population from that of Indian Flats Prong and account for its distribution length. It enters Indian Flats Prong at approximately 956 m (3,135 ft) elevation and its headwaters begin on the east side of Davis Ridge. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.4 km (0.9 mi) of stream is on National Park land.

Elevation:
Mouth - 956 m (3,135 ft)
Head - 1,317 m (4,320 ft)

Aspect: Northeast

Stream Size: Not Recorded

Percent Grade: 24.9%

Barriers: None Recorded

Water Quality: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: This stream was given the name Ridge Branch so that its brook trout population could be delineated separate from that of Indian Flats Prong. No historical data is available on this stream and it was probably surveyed in 1974 along with other streams in the Middle Prong Little River watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 956 m (3,135 ft) elevation up to about 1,036 m (3,400 ft) elevation at about 0.6 km (0.4 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

020 Seng Patch Branch

Map Location: Thunderhead Mountain Quadrangle (157-SW) and Silers Bald Quadrangle (157-SE). This stream is a tributary to Indian Flats Prong. Its headwaters begin on Mellinger Death Ridge, northwest of Cold Spring Knob. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.1 km (0.7 mi) of stream is on National Park land.

Elevation:
Mouth - 1,032 m (3,385 ft)
Head - 1,390 m (4,560 ft)

Aspect: West

Stream Size: Not Recorded

Percent Grade: 31.8%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: No historical data is available on this stream and it was probably surveyed in 1974 along with other streams in the Middle Prong Little River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,032 m (3,385 ft) elevation up to about 1,128 m (3,700 ft) elevation at about 0.5 km (0.3 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

021 Davis Branch

Map Location: Thunderhead Mountain Quadrangle (157-SW). This stream is a tributary to Indian Flats Prong that has no name on the quadrangle map. I have listed it as Davis Branch in order to separate the brook trout population from that of Indian Flats Prong and account for its distribution length. It enters Indian Flats Prong at approximately 1,035 m (3,395 ft) elevation and its headwaters begin on the northeast side of Mount Davis. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.1 km (0.7 mi) of stream is on National Park land.

Elevation:
Mouth - 1,035 m (3,395 ft)
Head - 1,341 m (4,400 ft)

Aspect: Northeast

Stream Size: Not Recorded

Percent Grade: 27.2%

Barriers: None Recorded

Water Quality: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: This stream was given the name Davis Branch so that its brook trout population could be delineated separate from that of Indian Flats Prong. No historical data is available

on this stream and it was probably surveyed in 1974 along with other stream in the Middle Prong Little River watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,035 m (3,395 ft) elevation up to about 1,061 m (3,480 ft) elevation at approximately 0.5 km (0.3 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

022 Meigs Creek

Map Location: Wear Cove Quadrangle (157-NW). This stream is a tributary to Little River. Its headwaters begin near Buckhorn Gap on the north side of Meigs Mountain. It is located in both Blount County and Sevier County, Tennessee.

Ownership Pattern: The entire 4.7 km (2.9 mi) of stream is on National Park land.

Elevation:
Mouth - 436 m (1,430 ft)
Head - 707 m (2,320 ft)

Aspect: Northwest

Stream Size: (Determined 29 January 1980 at 457 m - 1,500 ft elevation):
Average Width - 5.2 m (17.0 ft)

Percent Grade: 5.8%

Barriers:
1. Falls; approximately 7.6 m (25.0 ft) vertical height; near the mouth at about 439 m (1,440 ft) elevation.
2. Falls; approximately 4.6 m (15.0 ft) vertical height; at about 549 m (1,800 ft) elevation.

Water Quality: (Determined 6 November 1968 by TWRA stream survey):
pH - 6.5
Dissolved Oxygen - 13 ppm
M.O. Alkalinity - 13 ppm
Temperature - 19°C (67°F)

(Determined 5 November 1977 at about 457 m - 1,500 ft elevation):
pH - 6.5

Sources of Pollution: Possibly some light siltation from trail crossings.

Other Fish Species Present: Blacknose dace (Rhinichthys atratulus)

Fish Collected: 29 January 1980, data from National Park files
Brook Trout Average Length: 226.6 mm (8.9 in)
Brook Trout Average Weight: 131.8 g (4.7 oz)
Average K Brook Trout Greater Than 100 mm: 1.05
Number of Brook Trout Greater Than 100 mm: 34
Number of Brook Trout Less Than 100 mm: 0

25 July 1984 by Broadbent and Bivens
Brook Trout Average Length: 177.9 mm (7.0 in)
Brook Trout Average Weight: 68.4 g (2.4 oz)
Average K Brook Trout Greater Than 100 mm: 1.21
Number of Brook Trout Greater Than 100 mm: 8
Number of Brook Trout Less Than 100 mm: 7

Stream Conditions: There is an overall mixture of pools and riffles of about 50%. Riffle areas make up approximately 60% of the stream while about 30% is made up of pools, 3% in flats, and the remaining 7% is in cascades or bedrock areas. The stream bottom is composed of sand, fine gravel, and rubble with many rocks and boulders. Good stream conditions and cover for fish exist. Overall stream gradient is fairly low and siltation appears to be light.

Vegetative Conditions: The streambank has approximately 100% overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), yellow birch (Betula alleghaniensis), maples (Acer spp.), other hardwoods, dogwood (Cornus florida), dog hobble (Leucothoe editoium), and rhododendron (Rhododendron spp.).

Discussion: The first documented survey of Meigs Creek was by Burrows (1935). His party surveyed the stream in October 1934 and the report lists brook trout in the stream at that time.

Stocking records from the National Park files show that 4,810 brook trout were stocked in Meigs Creek from 1937 to 1940. Another 1,000 brook trout were stocked in the early 1970's, 500 in 1970 and another 500 in 1974. The stream also received 500 rainbow trout (Salmo gairdneri) in 1965.

Surveys in the late 1950's (data from National Park files) and the TWRA (1970b) stream survey report listed only brook trout present. Lennon and Parker (1960) listed both brook trout and rainbow trout in the stream and Kelly et al. (1980) reported both trout species in the stream in 1975.

However, due to recent stream work by Park Service personnel, the stream is known to have only brook trout at this time.

Allopatric brook trout occur from just above the falls near the mouth (Tim Broadbent, personal communication) at about 439 m (1,440 ft) elevation up to about 664 m (2,180 ft) elevation (Broadbent and Bivens 1984). This distribution is approximately 4.3 km (2.7 mi) long and includes a very small section on Curry Prong just above its mouth.

Meigs Creek has an excellent population of brook trout and good stream habitat conditions exist. It is also well protected by a large barrier falls near the mouth and no specific management is suggested. However, it might be good to use fish from this stream to re-establish brook trout populations in other Park streams or to increase the genetic variability of existing populations.

023 Laurel Branch

Map Location: Gatlinburg Quadrangle (157-NE). This stream is a tributary to Little River. Its headwaters begin west of Mt. Harrison on the south side of Cove Mountain. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 4.0 km (2.5 mi) of stream is on National Park land.

Elevation:
Mouth - 610 m (2,000 ft)
Head - 1,131 m (3,710 ft)

Aspect: South

Stream Size: (Determined 12 September 1984 at 805 m - 2,640 ft elevation)
Width - 3.1 m (10.3 ft)
Depth - 21.1 cm (8.3 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.17 (5.7 CFS)

Percent Grade: 13.0%

Barriers:
1. Laurel Falls; approximately 6.7 m (22.0 ft) vertical height; at about 780 m (2,560 ft) elevation.
2. Laurel Falls; approximately 8.5 m (28.0 ft) vertical height; at about 792 m (2,600 ft) elevation.
3. Falls; approximately 4.6 m (15.0 ft) vertical height; at about 872 (2,860 ft) elevation.

Water Quality: (Determined 18 February 1970 by TWRA stream survey):

pH - 6.7
Dissolved Oxygen - 17 ppm
M.O. Alkalinity - 6 ppm
Temperature - 7°C (45°F)

(Determined 21 August 1984 at 792 m - 2,600 ft elevation):
pH - 6.4
Total Hardness - 3 ppm
Temperature - 16°C (61°F)
Siltation - heavy

Sources of Pollution: Not Recorded

Other Species Present:
Rainbow trout (Salmo gairdneri) - lower stream only
Blacknose dace (Rhinichthys atratulus - lower stream only
Mayflies - (Ephemeroptera)
Stoneflies (Plecoptera)
Crayfish
Salamanders

Fish Collected: 12 September 1984 by Broadbent and Bivens
Brook Trout Average Length: 193.4 mm (7.6 in)
Brook Trout Average Weight: 107.6 6 (3.8 oz)
Average K Brook Trout Greater Than 100 mm: 1.49
Number of Brook Trout Greater Than 100 mm: 11
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: The stream above Laural Falls is mostly riffles with a few good pools and lots of bedrock. The bottom is composed of some sand and fine gravel with rubble, rocks, and many boulders. Siltation is heavy but riffles and spawning areas are clean.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), maples (Acer spp.), hemlock (Tsuga canadensis), dog hobble (Leucothoe editorum), and rhododendron (Rhododendron spp.).

Discussion: The first documented survey of Laural Branch was by Burrows (1935). His party surveyed the stream in October 1934 but his report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

Stocking records from the National Park files show that 1,300 brook trout were stocked in Laurel Branch in 1940, and 720 rainbow trout in 1939. However, only rainbow trout were reported in the stream in the late 1950's and early 1970's (Lennon and Parker 1960, TWRA 1970b; data from National Park files).

In an effort to re-establish the native trout in Park streams, Laurel Branch above Laurel Falls and Tanager Branch were considered likely choices. Park Service personnel knew that the streams above Laurel Falls were devoid of fish prior to 1980. That section of Laurel Branch was stocked in April with 82 brook trout that averaged 32.5 mm (1.3 in) in length. These fish reportedly came from hatchery holding ponds of the Cherokee Indian Reservation in North Carolina and were progeny of native brook trout from GSMNP streams.

The stream was surveyed in September of this year (Broadbent and Bivens 1984) and brook trout were found. Brook trout were collected from above Laurel Falls at 792 m (2,600 ft) elevation up to about 866 m (2,840 ft) elevation, a distance of approximately 0.3 km (0.2 mi). Two brook trout were also collected just below Laurel Falls. Both appeared to be males and one was 287.0 mm (11.3 in) long and weighed 340.0 g (12.1 oz).

Not many fish were found; however, those collected were in good shape. Brook trout average length was 193.4 mm (7.6 in) and the coefficient of condition (K) was 1.49. Also, this year's reproduction was noted. This stream should be monitored in years to come and stocking of more native brook trout higher up in the stream is also suggested.

024 Tanager Branch

Map Location: Gatlinburg Quadrangle (157-NE). This stream is a tributary to Laurel Branch which is a tributary to Little River. Its headwaters begin northeast of Chinquapin Ridge. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.7 km (1.7 mi) of stream is on National Park land.

Elevation:
Mouth - 817 m (2,680 ft)
Head - 1,158 m (3,800 ft)

Aspect: Southeast

Stream Size: (Determined 12 September 1984 at the mouth at 817 m-2,680 ft elevation):
Average Width: - 3.4 m (11.0 ft)

Percent Grade: 12.5%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present:
Mayflies (Ephemeroptera)
Salamanders
Crayfish

Fish Collected: 12 September 1984 by Broadbent and Bivens
Brook Trout Average Length: 199.3 mm (7.8 in)
Brook Trout Average Weight: 103.0 g (3.7 oz)
Average K Brook Trout Greater Than 100 mm: 1.30
Number of Brook Trout Greater Than 100 mm: 9
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: The stream has lots of riffles and bedrock areas with some good deep pools in the lower stream. The bottom is composed of sand, fine gravel, rubble, rocks, and boulders. Siltation is heavy but riffles and spawning areas are clean.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), maples (Acer spp.), yellow buckeye (Aesculus octandra), hemlock (Tsuga canadensis), dog hobble (Leucothoe editorum), and rhododendron (Rhododendron spp.).

Discussion: No historical data is available on this stream. However, Park Service personnel knew that it was devoid of fish prior to 1980 and in an effort to re-establish the native trout in Park streams, Tanager Branch, along with Laurel Branch were considered likely choices.

Tanager Branch was stocked in April 1980 with 42 brook trout that averaged 32.5 mm (1.3 in) in length. These fish reportedly came from hatchery holding ponds of the Cherokee Indian Reservation in North Carolina and were progeny of native brook trout from GSMNP streams.

The stream was surveyed in September of this year (Broadbent and Bivens 1984) and brook trout were found. Brook trout were collected from the mouth at 817 m (2,680 ft) elevation up to about 841 m (2,760 ft) elevation, a distance of approximately 0.2 km (0.1 mi). Not many fish were found;

however, they were in good shape. Brook trout average length was 199.3 m (7.8 in) and the coefficient of condition (K) was 1.30. Also, this year's reproduction was noted. This stream should be monitored in years to come and stocking of more native brook trout higher up in the stream is also suggested.

025 Jakes Creek

Map Location: Gatlinburg Quadrangle (157-NE) and Silers Bald Quadrangle (157-SE). This stream is a tributary to Little River. Its headwaters begin near Jakes Gap, north of Dripping Spring Mountain. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 4.8 km (3.0 mi) of stream is on National Park land.

Elevation:
Mouth - 652 m (2,140 ft)
Head - 1,128 m (3,700 ft)

Aspect: Northeast

Stream Size:
Average Width - 4.6 m (15.0 ft)
Width Varies - 0.3 to 12.2 m (1.0 to 40.0 ft)
Average Pool Depth - 0.6 m (2.0 ft)
Average Riffle Depth - 7.6 cm (3.0 in)
Cubic Meters Per Second - 0.15 (5.0 CFS)

Percent Grade: 9.8%

Barriers: None Recorded

Water Quality: (Determined 18 February 1970 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 12 ppm
Hardness - 17 ppm
M.O. Alkalinity - 6 ppm
Temperature - 7°C (45°F)
Siltation - moderate

(Determined 25 June 1974 at 945 m - 3,100 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.5
Temperature - 11°C (52°F)

Sources of Pollution: Not Recorded

Other Species Present:
Rainbow trout (Salmo gairdneri)
Caddisflies (Trichoptera)
Stonflies (Plecoptera)

Fish Collected: 25 June by U.S. Fish and Wildlife Service
Number of Rainbow Trout Greater Than 100 mm: 13
Number of Rainbow Trout Less Than 100 mm: 2

Stream Conditions: Approximately 15% of the stream is estimated to be in pools. The stream bottom is composed primarily of rubble, boulders, and bedrock. Cover for fish is good in 40% of the stream. Siltation is moderate.

Vegetative Conditions: The local watershed has 100% forest cover. Shade or canopy is good over 35% of the stream.

Discussion: The first documented survey of Jakes Creek was by Burrows (1935). His party surveyed the stream in October 1934 but his report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

Holloway (1945) stated that Jakes Creek had both rainbow trout and native brook trout in 1945. However, only rainbow trout were reported in the stream in the late 1950's (Lennon and Parker 1960; data from National Park files). Stocking records from the National Park files show that 11,719 rainbow trout were stocked in Jakes Creek from 1937 to 1952 and no brook trout were ever stocked.

Both brook trout and rainbow trout were reported in the stream by the TWRA (1970b) stream survey report. But, surveys by the U.S. Fish and Wildlife Service in 1974 found only rainbow trout present (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map; data from National Park files). This stream probably has no future potential for brook trout management due to the firmly established rainbow trout population.

026 Newt Prong

Map Location: Gatlinburg Quadrangle (157-NE) and Silers Bald Quadrangle (157-SE). This stream is a tributary to Jakes Creek which is at tributary to Little River. Its headwaters begin on the northeast side of Dripping Spring Mountain. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on National Park land.

Elevation:
Mouth - 850 m (2,790 ft)
Head - 1,213 m (3,980 ft)

Aspect: North

Stream Size: (Determined 25 June 1974 at 853 m - 2,800 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 4.9 m (16.0 ft)

Percent Grade: 17.3%

Barriers: None Recorded

Water Quality: (Determined 25 June 1974 at 853 m - 2,800 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.9
Temperature - 10°C (50°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (*Salmo gairdneri*)

Fish Collected: 25 June 1974 by U.S. Fish and Wildlife Service
Number of Rainbow Trout Greater Than 100 mm: 10
Number of Rainbow Trout Less Than 100 mm: 16

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The TWRA (1970b) stream survey report listed both brook trout and rainbow trout present in Newt Prong. However, stream surveys made in 1974 by the U.S. Fish and Wildlife Service found only rainbow trout present (data from National Park files: GSMNP 1972-1977 brook trout distribution map). The stream probably has no future potential for brook trout management due to the firmly established rainbow trout population.

027 Huskey Branch

Map Location: Gatlinburg Quadrangle (157-NE). This stream is a tributary to Little River. Its headwaters begin east of Bent Arm. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.4 km (1.5 mi) of stream is on National Park land.

Elevation:
Mouth - 759 m (2,490 ft)
Head - 1,122 m (3,682 ft)

Aspect: Northeast

Stream Size: (Determined 26 June 1974 at 799 m - 2,620 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 2.4 m (8.0 ft)

Percent Grade: 15.1%

Barriers:
1. Falls; approximately 2.4 m (8.0 ft) vertical height; near the mouth at about 762 m (2,500 ft) elevation.
2. Falls; approximately 2.0 m (6.5 ft) vertical height; at about 969 m (3,180 ft) elevation.

Water Quality: (Determined 10 July 1969 near the mouth by U.S. Fish and Wildlife Service survey):
pH - 6.5
Dissolved Oxygen - 8 ppm
M.O. Alkalinity - 17 ppm
CO_2 - 5 ppm
Temperature - 17°C (62°F)

(Determined 26 June 1974 at 799 m - 2,620 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.5
Tempetarure - 11°C (52°F)

Sources of Pollution: Not Recorded

Other Species Present:
Salamanders
Stoneflies (Plecoptera)

Fish Collected: 26 June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 2
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: The first documented survey of Huskey Branch was by Burrows (1935). His party surveyed the stream in October 1934 but his report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

Stocking records from the National Park files show that Huskey Branch has been stocked on one occasion only. The stream was stocked with 480 brook trout in 1937 and according to records, no rainbow trout (Salmo gairdneri) were ever stocked. Only brook trout were reported in the stream from 1953 to 1960 (Lennon and Parker 1960; Lennon 1967; data from National Park files). Kelly et al. (1980) also reported only brook trout in the stream during surveys made in 1974.

Brook trout were found from above the falls, located near the mouth at about 762 m (2,500 ft) elevation, up to about 1,000 m (3,280 ft) elevation and the stream has approximately 1.9 km (1.2 mi) of allopatric brook trout water. This distribution includes two small tributaries; one enters at about 799 m (2,260 ft) elevation and the other at about 975 m (3,200 ft) elevation (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map).

Recent survey work by Park Service personnel found that brook trout were still present in the stream in March of this year. Brook trout were found up to about 829 m (2,720 ft) elevation on 15 March 1984 but the stream was not checked above this point (data from National Park files). The stream apparently has a viable brook trout population that is well protected by the waterfall at the mouth. Therefore, no management is suggested.

028 Fish Camp Prong

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Little River. Its headwaters begin about 1.6 km (1.0 mi) northwest of Silers Bald. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 9.0 km (5.6 mi) of stream is on National Park land.

Elevation:
Mouth - 831 m (2,725 ft)
Head - 1,378 m (4,520 ft)

Aspect: Northeast

Stream Size: (Determined 27 June 1974 at 1,097 m - 3,600 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 3.2 m (10.5 ft)

Percent Grade: 6.1%

Barriers:
1. Cascades; at about 910 m (2,985 ft) elevation.
2. Cascades; at about 925 m (3,035 ft) elevation.

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (*Salmo gairdneri*)

Fish Collected: 27 June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 20
Number of Brook Trout Less Than 100 mm: 4
Number of Rainbow Trout Greater Than 100 mm: 1
Number of Rainbow Trout Less Than 100 mm: 3

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: King (1937) stated that Fish Camp Prong was once noted for its abundance of native brook trout. But after the watershed was logged with skidders in 1924 and burned severely in 1925, and again in 1930, he reported that the stream supported only a meager brook trout population by the mid-1930's.

The first documented survey of Fish Camp Prong was by Burrows (1935). His party surveyed the stream in October 1934 and reported that both brook trout and rainbow trout were present at that time. He recommended stocking of both trout species in the stream. Stocking records from the National Park files show that Fish Camp Prong was stocked with 3,710 brook trout in 1938 and with 3,955 rainbow trout between 1936 and 1937.

The TWRA (1970b) stream survey report listed both brook trout and rainbow trout present. Kelly et al. (1980) also reported that both species were found in the stream in 1974.

Brook trout were found from about 1,036 m (3,400 ft) elevation up to about 1,305 m (4,280 ft) elevation. The stream has about 2.4 km (1.5 mi) of sympatric brook/rainbow trout and approximately 1.1 km (0.7 mi) of allopatric brook trout water. This allopatric distribution includes one tributary above 1,170 m (3,840 ft) elevation (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map). This stream may be a good candidate for future stream renovation work.

029 Goshen Prong

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Fish Camp Prong. Its headwaters begin east of Double Spring Gap. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 5.3 km (3.3 mi) of stream is on National Park land.

Elevation:
Mouth - 1,013 m (3,322 ft)
Head - 1,658 m (5,440 ft)

Aspect: Northwest

Stream Size: (Determined in 1974 at 1,128 m - 3,700 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 4.8 m (15.8 ft)

Percent Grade: 12.2%

Barriers: 1. Cascades; at about 1,122 m (3,680 ft) elevation; at the mouth of Jenkins Creek.

Water Quality: (Determined in 1974 at 1,128 m - 3,700 elevation by U.S. Fish and Wildlife Service survey):
pH - 6.5
Temperature - 10°C (50°F)

Sources of Pollution: Not Recorded

Other Fish Species Present:
Rainbow trout (*Salmo gairdneri*)
Longnose dace (*Rhinichthys cataractae*)

Fish Collected: June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 4
Number of Brook Trout Less Than 100 mm: 1
Number of Rainbow Trout Greater Than 100 mm: 20
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of Goshen Prong was by Burrows (1935). His party surveyed the stream in October 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

Brook trout and rainbow trout were reported in the stream in 1974. Brook trout were found from about 1,073 m (3,520 ft) elevation up to about 1,341 m (4,400 ft) elevation. The stream has approximately 0.6 km (0.4 mi) of sympatric brook/rainbow below a cascades at about 1,122 m (3,680 ft) elevation and approximately 1.9 km (1.2 mi) of allopatric brook trout water above the cascades (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map). This cascades is apparently a barrier to upstream movement of rainbow trout.

One interesting note; brook trout from Goshen Prong were used by Harris et al. (1978) of Tennessee Technological University, Tennessee Cooperative Fishery Research Unit in genetic research of brook trout from the Southern Appalachian region, by Konopacky (1978) for age and growth analysis, and by Robinette (1978) for life history investigations of GSMNP brook trout.

030 Jenkins Creek

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Goshen Prong which is a tributary to Fish Camp Prong. It has no name on the quadrangle map and I have lsited it as Jenkins Creek in order to separate the brook trout population from that of Goshen Prong and account for its distribution length. It enters Goshen Prong at approximately 1,122 m (3,680 ft) elevation and its headwaters begin just northwest of Jenkins Knob. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.6 km (1.6 mi) of stream is on National Park land.

Elevation:
Mouth - 1,122 m (3,680 ft)
Head - 1,609 m (5,280 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 18.9%

Barriers: 1. Cascades near the mouth; at about 1,122 m (3,680 ft) elevation.

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: This stream was given the name Jenkins Creek so that its brook trout population could be delineated separate from that of Goshen Prong. No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the upper Little River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,122 m (3,680 ft) elevation up to about 1,390 m (4,560 ft) elevation at about 2.1 km (1.3 mi) above the mouth. Brook trout also extend up the right fork tributary for another 0.3 km (0.2 mi) to about 1,402 m (4,600 ft) elevation. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

031 Left Branch

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Goshen Prong which is a tributary to Fish Camp Prong. It has no name on the quadrangle map and I have listed it as Left Branch in order to separate the brook trout population from that of Goshen Prong and account for its distribution length. It enters Goshen Prong at approximately 1,208 m (3,962 ft) elevation and its headwaters begin on the west side of Goshen Ridge. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.1 km (0.7 mi) of stream is on National Park land.

Elevation:
Mouth - 1,208 m (3,962 ft)
Head - 1,402 m (4,600 ft)

Aspect: West

Stream Size: Not Recorded

Percent Grade: 17.3%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: This stream was given the name Left Branch so that its brook trout population could be delineated separate from that of Goshen Prong. No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the upper Little River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,208 m (3,962 ft) elevation up to about 1,341 m (4,400 ft) elevation at about 0.8 km (0.5 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headauarters in Gatlinburg, Tennessee.

032 Double Spring Branch

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Goshen Prong which is a tributary to Fish Camp Prong. It has no name on the quadrangle map and I have listed it as Double Spring Branch in order to separate the brook trout population from that of Goshen Prong and account for its distribution length. It enters Goshen Prong at approximately 1,241 m (4,070 ft) elevation and its headwaters begin at Double Spring Gap just east of Jenkins Knob. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.3 km (1.4 mi) of stream is on National Park land.

Elevation:
Mouth - 1,241 m (4,070 ft)
Head - 1,670 m (5,480 ft)

Aspect: North

Stream Size: Not Recorded

Percent Grade: 19.1%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: This stream was given the name Double Spring Branch so that its brook trout population could be delineated separate from that of Goshen Prong. No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the upper Little River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,241 m (4,070 ft) elevation up to about 1,487 m (4,880 ft) elevation at about 1.8 km (1.1 mi) above the mouth. Brook trout also extend up the left fork tributary for another 0.2 km (0.1 mi) to about (4,840 ft) elevation. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

033 Silers Creek

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Fish Camp Prong. Its headwaters begin north of Silers Bald and east of Silers Lead. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 3.1 km (1.9 mi) of stream is on National Park land.

Elevation:
Mouth - 1,024 m (3,360 ft)
Head - 1,463 m (4,800 ft)

Aspect: North

Stream Size:
Average Width - 2.1 m (7.0 ft) at 1,036 m (3,400 ft) elevation
Cubic Meters Per Second - varied from 0.03 to 0.14 (1.0 to 4.7 CFS)

Percent Grade: 14.4%

Barriers:
1. Cascades; at about 1,049 m (3,442 ft) elevation.
2. Cascades; at about 1,127 m (3,698 ft) elevation.

Water Quality: (Determined 27 May 1984 at 1,036 - 3,400 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.5
Temperature - 10°C (50°F)

(Determined in the summers of 1977 and 1978, from Moore et al. 1981):
pH - varied from 6.8 to 6.9
Conductivity - 10 umhos/cm (in 1978)

Sources of Pollution: Not Recorded

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Longnose dace (Rhinichthys cataractae)

Fish Collected: May and June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 6
Number of Brook Trout Less Than 100 mm: 3
Number of Rainbow Trout Greater Than 100 mm: 15
Number of Rainbow Trout Less Than 100 mm: 3

Stream Conditions: Not Recorded

Vegetative Conditions: The stream has approximately 100% of overstory and understory vegetation. Watershed vegetation includes second growth yellow birch (Betula alleghaniensis), sweet birch (Betula lenta), maple (Acer spp.), hemlock (Tsuga canadensis), yellow buckeye (Aesculus octandra), yellow poplar (Liriodendron tulipifera), rhododendron (Rhododendron spp.), wild hydrangea (Hydrangea arborescens), and dog hobble (Leucothoe editorum).

Discussion: The first documented survey of Silers Creek was by Burrows (1935). His party surveyed the stream in October 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

Brook trout and rainbow trout were reported in the stream in 1974. Brook trout were found from about 1,036 m (3,400 ft) elevation up to about 1,353 m (4,440 ft) elevation. The stream has approximately 1.0 km (0.6 mi) of sympatric brook/rainbow trout and about 1.8 km (1.1 mi) of allopatric brook trout water (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map).

Silers Creek was used by Moore et al. (1981, 1983) as a study stream for changes in standing crop of brook trout concurrent with removal of rainbow trout from GSMNP streams. This stream should be monitored in the future and a continued effort should be made to remove rainbow trout.

034 Narrows Branch

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Silers Creek. Its headwaters begin north of The Narrows and northeast of Silers Bald. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.6 km (1.0 mi) of stream is on National Park land.

Elevation:
Mouth - 1,155 m (3,790 ft)
Head - 1,402 m (4,600 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 15.3%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Little River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,155 m (3,790 ft) elevation up to about 1,317 m (4,320 ft) elevation at approximately 1.3 km (0.8 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

035 Buckeye Gap Prong

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Fish Camp Prong. Its headwaters begin north of Buckeye Gap, just east of Cold Spring Knob. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.6 km (1.6 mi) of stream is on National Park land.

Elevation:
Mouth - 1,081 m (3,545 ft)
Head - 1,378 m (4,520 ft)

Aspect: Northeast

Stream Size: (Determined in 1974 at 1,219 m - 4,000 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 2.4 m (8.0 ft)

Percent Grade: 11.5%

Barriers: None Recorded

Water Quality: (Determined in 1974 at 1,219 m - 4,000 elevation by U.S. Fish and Wildlife Service survey):
pH - 6.7
Temperature - 10°C (50°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 10
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: No historical data is available on this stream. It was surveyed in 1974 (data from National Park files) along with other streams in the Little River Watershed. Brook trout were found from the mouth at 1,081 m (3,454 ft) elevation up to about 1,305 m (4,280 ft) elevation. A sympatric brook/rainbow trout population exists to about 1.4 km (0.9 mi) above the mouth and the stream has approximately 1.0 km (0.6 mi) of allopatric brook trout water (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map).

036 Small Branch

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Fish Camp Prong. It has no name on the quadrangle map and I have listed it as Small Branch in order to separate the brook trout population from that of Fish Camp Prong and account for its distribution length. It enters Fish Camp Prong at approximately 1,114 m (3,655 ft) elevation and its headwaters begin on the west side of Silers Lead, northwest of Silers Bald. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.3 km (0.8 mi) of stream is on National Park land.

Elevation:
Mouth - 1,114 m (3,655 ft)
Head - 1,353 m (4,440 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 18.6%

Barriers: None Recorded

Water Quality: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: This stream was given the name Small Branch so that its brook trout population could be delineated separate from that of Fish Camp Prong. No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the upper Little River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,114 m (3,655 ft) elevation up to about 1,244 m (4,080 ft) elevation at approximately 0.6 km (0.4 mi) above the mouth. All information of this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

037 Shelter Spring Branch

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Fish Camp Prong. It has no name on the quadrangle map and I have listed it as Shelter Spring Branch in order to separate the brook trout population from that of Fish Camp Prong and account for its distribution length. It enters Fish Camp Prong at approximately 1,122 m (3,680 ft) elevation and its headwaters begin from a spring just west of Silers Bald. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on National Park land.

Elevation:
Mouth - 1,122 m (3,680 ft)
Head - 1,652 m (5,420 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 25.3%

Barriers: None Recorded

Water Quality: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Stream Conditions: Not Recorded

Vegetative Conditions: The local waterhsed has 100% forest cover.

Discussion: This stream was given the name Shelter Spring Branch so that its brook trout population could be delineated separate from that of Fish Camp Prong. No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the upper Little River Watershed (Kelly et al. 1980). A sympatric brook/rainbow trout population exists from the mouth at 1,122 m (3,680 ft) elevation up to about 1,183 m (3,880 ft) elevation at about 0.3 km (0.2 mi) above the mouth. From that point up to about 1,378 m (4,520 ft) elevation an allopatric brook trout population exists. The length of the pure brook trout water is about 1.1 km (0.7 mi). All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

038 Meigs Post Prong (Left Fork)

Map Location: Silers Bald Quadrangle (157-SE) and Clingmans Dome Quadrangle (165-SW). This stream is a tributary to Little River. Its headwaters begin on the west side of Mount Collins. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 4.2 km (2.6 mi) of stream is on National Park land.

Elevation:
Mouth - 977 m (3,205 ft)
Head - 1,695 m (5,560 ft)

Aspect: Northwest

Stream Size: (Determined 25 June 1974 at 1,146 m - 3,760 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 6.2 m (20.3 ft)

Percent Grade: 17.2%

Barriers:
1. Falls; at about 1,128 m (3,700 ft) elevation; at the mouth of Sweet Creek.
2. Wilson Falls; at about 1,582 m (5,190 ft) elevation.

Water Quality: (Determined 25 June 1974 at 1,146 m - 3,760 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 7.0
Temperature - 11°C (51°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 25 June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 12
Number of Brook Trout Less Than 100 mm: 0
Number of Rainbow Trout Greater Than 100 mm: 11
Number of Rainbow Trout Less Than 100 mm: 3

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: Powers (1929) referred to Meigs Post Prong as Left Fork and stated that rainbow trout occurred in this stream up to a zone where the timber had not been cut. Above this zone the native brook trout was found on up the stream. King (1937) reported that the native brook trout was apparently "holding ground" but that the rainbow trout had begun to extend its range in the watershed by 1935 and 1936.

The first documented survey of Meigs Post Prong was by Burrows (1935). His party surveyed the stream in October 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed though.

Both brook trout and rainbow trout were reported in the stream from 1953 to 1970 (Lennon and Parker 1960; Lennon 1967; TWRA 1970b; data from National Park files). Kelly et al. (1980) also reported that both trout species were present in the stream in 1974.

Brook trout were found from 1,116 m (3,660 ft) elevation up to about 1,561 m (5,120 ft) elevation. A sympatric brook/rainbow trout population exists for about 0.2 km (0.1 mi)

below the waterfall at 1,128 m (3,700 ft) elevation, above the waterfall the stream has approximately 1.8 km (1.1 mi) of allopatric brook trout water. The upper stream appears to be protected from encroachment of rainbow trout above this waterfall.

039 Sweet Creek

Map Location: Silers Bald Quadrangle (157-SE) and Clingmans Dome Quadrangle (165-SW). This stream is a tributary to Meigs Post Prong. Its headwaters begin on the southwest side of Sugarland Mountain near Sweet Ridge. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.9 km (1.2 mi) of stream is on National Park land.

Elevation:
Mouth - 1,128 m (3,700 ft)
Head - 1,451 m (4,760 ft)

Aspect: Southwest

Stream Size: (Determined 25 June 1974 at 1,146 m - 3,760 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 6.1 m (20.0 ft)

Percent Grade: 16.7%

Barriers: None Recorded

Water Quality: (Determined 25 June 1974 at 1,146 m - 3,760 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.7
Temperature - 11°C (51°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: None

Fish Collected: 25 June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 18
Number of Brook Trout Less Than 100 mm: 2

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: Brook trout were reported in this stream from 1953 to 1959 (Lennon 1967) and they were also present in 1974 (Kelly et al. 1980).

Brook trout were found from the mouth at 1,128 m (3,700 ft) elevation up to about 1,329 m (4,360 ft) elevation and the stream has approximately 1.8 km (1.1 mi) of allopatric brook trout water. This distribution includes two tributaries above 1,219 m (4,000 ft) elevation. The brook trout population is apparently protected from encroachment of exotic trout species by a waterfall located on Meigs Post Prong at the mouth of Sweet Creek.

040 Grouse Creek (Right Fork, Right Prong)

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Little River. Its headwaters begin on the east side of Goshen Ridge. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.7 km (1.7 mi) of stream is on National Park land.

Elevation:
Mouth - 1,026 m (3,365 ft)
Head - 1,463 m (4,800 ft)

Aspect: Northeast

Stream Size: (Determined in 1974 at 1,036 m - 3,400 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 6.1 m (20.0 ft)

Percent Grade: 16.0%

Barriers: 1. Falls; at about 1,134 m (3,720 ft) elevation; at the mouth of Rattler Branch.

Water Quality: (Determined in 1974 at 1,036 m - 3,400 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.5
Temperature - 10°C (50°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 30
Number of Brook Trout Less Than 100 mm: 2
Number of Rainbow Trout Greater Than 100 mm: 25
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: Powers (1929) referred to Grouse Creek as Right Fork and stated that only native brook trout then occupied the stream above a zone of uncut forest and that rainbow trout occurred only below this zone in Little River and Left Fork (Meigs Post Prong). King (1937) reported that the native brook trout was apparently "holding ground" but that the rainbow trout had extended its range about 0.8 km (0.5 mi) up Grouse Creek by 1935 and 1936.

Both trout species were reported in the stream from 1945 to 1970 (Holloway 1945; Lennon and Parker 1960; Lennon 1967; TWRA 1970b; data from National Park files). Kelly et al. (1980) also reported both brook trout and rainbow trout were in the stream in 1974.

Brook trout were found from the mouth at 1,026 m (3,365 ft) elevation up to about 1,359 m (4,460 ft) elevation. A sympatric brook/rainbow trout population exists for about 0.8 km (0.5 mi) above the mouth and the stream has approximately 1.3 km (0.8 mi) of allopatric brook trout water. A waterfall near the mouth of Rattler Branch at 1,134 m (3,720 ft) elevation is apparently a barrier to the upstream movement of rainbow trout and the current sympatric zone corresponds to that reported by King (1937).

041 Spud Town Branch

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Grouse Creek. Its headwaters begin on the north side of Mount Buckley. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.7 km (1.7 mi) of stream is on National Park land.

Elevation:
Mouth - 1,050 m (3,445 ft)
Head - 1,586 m (5,205 ft)

Aspect: North

Stream Size: (Determined 26 June 1974 at 1,097 m - 3,600 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 3.0 m (10.0 ft)

Percent Grade: 19.6%

Barriers: None Recorded

Water Quality: (Determined 26 June 1974 at 1,097 m - 3,600 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.7
Temperature - 10°C (50°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: None

Fish Collected: 26 June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 9
Number of Brook Trout Less Than 100 mm: 1

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of Spud Town Branch was by Burrows (1935). His party surveyed the stream in October 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

Both brook trout and rainbow trout (Salmo gairdneri) were reported in the stream from 1953 to 1960 (Lennon and Parker; Lennon 1967; data from National Park files). However, Kelly et al. (1980) reported only brook trout in the stream in 1975.

Brook trout were found from the mouth at 1,050 m (3,445 ft) elevation up to about 1,342 m (4,400 ft) elevation and the stream has approximately 1.9 km (1.1 mi) of allopatric brook trout water (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map).

042 Rattler Branch

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Grouse Creek. Its headwaters begin northwest of Mount Buckley. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on National Park land.

Elevation:
Mouth - 1,134 m (3,720 ft)
Head - 1,585 m (5,200 ft)

Aspect: North

Stream Size: Not Recorded

Percent Grade: 21.6%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: Brook trout were reported in Rattler Branch from 1953 to 1960 (Lennon and Parker 1960; Lennon 1967; data from National Park files). Kelly et al. (1980) also reported that brook trout were present in the stream in 1975.

Brook trout were found from the mouth at 1,134 m (3,720 ft) elevation up to about 1,463 m (4,800 ft) elevation and the stream has approximately 1.6 km (1.0 mi) of allopatric brook trout water (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map). This stream is apparently protected from encroachment of exotic trout species by a waterfall located on Grouse Creek near the mouth of Rattler Branch.

043 Devil Branch

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Grouse Creek. Its headwaters begin northwest of Mount Buckley. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.3 km (0.8 mi) of stream is on National Park land.

Elevation:
Mouth - 1,196 m (3,925 ft)
Head - 1,561 m (5,120 ft)

Aspect: North

Stream Size: Not Recorded

Percent Grade: 28.3%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Little River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,196 m (3,925 ft) elevation up to about 1,487 m (4,880 ft) elevation at approximately 1.0 km (0.6 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

044 Snake Tongue

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Grouse Creek. Its headwaters begin northwest of Mount Buckley. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.0 km (6.0 mi) of stream is on National Park land.

Elevation:
Mouth - 1,247 m (4,090 ft)
Head - 1,439 m (4,720 ft)

Aspect: North

Stream Size: Not Recorded

Percent Grade: 19.9%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Little River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,247 m (4,090 ft) elevation up to about 1,408 m (4,620 ft) elevation at approximately 0.6 km (0.4 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

045 Kuwahi Branch

Map Location: Silers Bald Quadrangle (157-SE). This stream is a tributary to Little River. Its headwaters begin on the north side of Mount Buckley. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.6 km (1.6 mi) of stream is on National Park land.

Elevation:
Mouth - 1,074 m (3,523 ft)
Head - 1,561 m (5,120 ft)

Aspect: North

Stream Size: (Determined in 1974 at 1,076 m - 3,350 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 4.4 m (14.5 ft)

Percent Grade: 18.9%

Barriers: None Recorded

Water Quality: (Determined in 1974 at 1,076 m - 3,530 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.7
Temperature - 11°C (52°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 7
Number of Brook Trout Less Than 100 mm: 0
Number of Rainbow Trout Greater Than 100 mm: 4
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of Kuwahi Branch was by Burrows (1935). His party surveyed the stream in October 1934 but the report listed only rainbow trout present in the stream. However, brook trout were reported in the stream from 1952 to 1960 (Lennon and Parker 1960; Lennon 1967; data from National Park files) and Kelly et al. (1980) reported that both trout species were present in the stream in 1975.

Brook trout were found from the mouth at 1,074 m (3,523 ft) elevation up to about 1,463 m (4,800 ft) elevation. A sympatric brook/rainbow trout population exists for about 0.5 km (0.3 mi) above the mouth and the stream has approximately 1.9 km (1.2 mi) of allopatric brook trout water (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map). This stream should be monitored in the future to assess the extent of rainbow trout encroachment.

046 Love Branch

Map Location: Clingmans Dome Quadrangle (157-SW). This stream is a tributary to Little River. It has no name on the quadrangle map and I have listed it as Love Branch in order to separate the brook trout population from that of the Little River headwaters and account for its distribution length. It enters Little River at approximately 1,314 m (4,310 ft) elevation and its headwaters begin on the north side of Mount

Love, and approximately 0.8 km (0.5 mi) northeast of Clingmans Dome. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.3 km (0.8 mi) of stream is on National Park land.

Elevation:
Mouth - 1,314 m (4,310 ft)
Head - 1,701 m (5,580 ft)

Aspect: North

Stream Size: Not Recorded

Percent Grade: 30.1%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: This stream was given the name Love Branch so that its brook trout population could be delineated separate from that of the Little River headwaters. No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the upper Little River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,314 m (4,310 ft) elevation up to about 1,463 m (4,800 ft) elevation at approximately 0.6 km (0.4 mi) above the mouth. Brook trout also extend a short way up the left fork tributary. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

047 Dudley Creek (Headwaters)

Map Location: Gatlinburg Quadrangle (157-NE) and Mount Le Conte Quadrangle (165-NW). This stream is a tributary to West Prong Little Pigeon River. Its headwaters begin north of Mount Winnesoka. It is located in Sevier County, Tennessee.

Ownership Pattern: Total stream length is 11.7 km (7.3 mi). Approximately 6.9 km (4.3 mi) of the upper stream is within the GSMNP, and the remaining 5.8 km (3.0 mi) of lower stream runs through private land.

Elevation:
Mouth - 377 m (1,238 ft)
Head - 963 m (3,160 ft)

Aspect: Northwest

Stream Size: (Determined 27 June 1975 at 561 m - 1,840 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 2.7 m (9.0 ft)

Percent Grade: 5.0%

Barriers: None Recorded (in the headwaters)

Water Quality: (Determined 27 June 1975 at 561 m - 1,840 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 7.0
Temperature - 18°C (65°F)
Siltation - fairly heavy

Sources of Pollution: Heavy siltation from horse trail that parallels and crosses the stream.

Other Fish Species Present:
Rainbow trout (*Salmo gairdneri*)
Blacknose dace (*Rhinichthys atratulus*)

Fish Collected: 27 June 1974 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 5
Number of Brook Trout Less Than 100 mm: 0
Number of Rainbow Trout Greater Than 100 mm: 15
Number of Rainbow Trout Less Than 100 mm: 5

Stream Conditions: Not Recorded

Vegetative Conditions: The local headwater watershed has 100% forest cover.

Discussion: The first documented survey of Dudley Creek was by Burrows (1935). His party surveyed the stream in October 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

Stocking records from National Park files show that 1,770 brook trout were stocked in Dudley Creek from 1937 to 1940. Brook trout were also stocked in 1960 (Kelly et al. 1980).

The TWRA (1970b) stream survey report listed both brook trout and rainbow trout present in the stream. Kelly et al. (1980) also reported that both trout species were found in the stream in 1975. At that time the stream had a sympatric brook/rainbow trout zone that started at about 549 m (1,800 ft) elevation and went up to about 707 m (2,320 ft) elevation. This zone was approximately 1.8 km (1.1 mi) in length.

Recent survey work by Park Service personnel this past summer (1984) found only a few rainbow trout and no brook trout in Dudley Creek. Siltation is reportedly heavy and is suspected of being the cause of problems with the trout population in the stream (Jeanne R. Harsson, personal communication). This stream probably has no future management potential for brook trout due to poor habitat conditions.

048 Twin Creek

Map Location: Mount Le Conte Quadrangle (165-NW). This stream is a tributary to Dudley Creek which is a tributary to West Prong Little Pigeon River. Its headwaters begin north of Mount Winnesoka. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.3 km (1.4 mi) of stream is on National Park land.

Elevation:
Mouth - 549 m (1,802 ft)
Head - 805 m (2,640 ft)

Aspect: North

Stream Size: Not Recorded

Percent Grade: 11.3%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (*Salmo gairdneri*)

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the West Prong Little Pigeon River Watershed (Kelly et al. 1980). A sympatric brook/rainbow trout population exists from the mouth at 549 m (1,802 ft) elevation up to about 689 m (2,260 ft) elevation at approximately 1.4 km (0.9 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

049 Bales Branch

Map Location: Mount Le Conte Quadrangle (165-NW). This stream is a tributary to Rocky Spur Branch which is a tributary to Roaring Fork. It has no name on the quadrangle map and I have listed it as Bales Branch in order to account for its distribution length. It enters Rocky Spur Branch at approximately 832 m (2,730 ft) elevation and its headwaters begin north of Rocky Spur. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.6 km (1.0 mi) of stream is on National Park land.

Elevation:
Mouth - 832 m (2,730 ft)
Head - 1,122 m (3,680 ft)

Aspect: Northeast

Stream Size: Not Recorded

Percent Grade: 18.0%

Barriers: None Recorded

Water Quality: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: This stream was given the name Bales Branch so that its brook trout population could be delineated. No historical data is available on this stream. Park Service personnel found a small remnant allopatric brook trout population during recent stream surveys (Tim Broadbent, personal communication). Brook trout were found from about 853 m (2,800 ft) elevation up to about 902 m (2,960 ft) elevation, a distance of approximately 0.3 km (0.2 mi).

050 Road Prong (Indian Gap Fork)

Map Location: Mount Le Conte Quadrangle (165-NW) and Clingmans Dome Quadrangle (165-SW). This stream is a tributary to West Prong Little Pigeon River. Its headwaters begin south of Mingus Lead. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 4.7 km (2.9 mi) of stream is on National Park land.

Elevation:
Mouth - 1,013 m (3,325 ft)
Head - 1,597 m (5,240 ft)

Aspect: Northeast

Stream Size:
Average Width - 3.0 m (10.0 ft)
Width Varies - 0.3 to 9.1 m (1.0 to 30.0 ft)
Average Pool Depth - 0.6 m (2.0 ft)
Average Riffle Depth - 7.6 cm (3.0 in)
Cubic Meters Per Second - 0.12 (4.0 CFS)

Percent Grade: 12.5%

Barriers:
1. Cascades; at about 1,027 m (3,370 ft) elevation.
2. Cascades; at about 1,070 m (3,510 ft) elevation.
3. Cascades; at about 1,134 m (3,720 ft) elevation.

Water Quality: (Determined 18 February 1970 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 13 ppm
Hardness - 17 ppm
M.O. Alkalinity - 6 ppm
Temperature - 4°C (40°F)
Siltation - light

(Determined 30 June 1975 at 1,061 m - 3,480 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 7.0
Temperature - 16°C (60°F)

Sources of Pollution: Not Recorded

Other Species Present:

Rainbow trout (Salmo gairdneri)
Stoneflies (Plecoptera)

Fish Collected:
Number of Brook Trout Greater Than 100 mm: 20
Number of Brook Trout Less Than 100 mm: 15
Number of Rainbow Trout Greater Than 100 mm: 11
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: Approximately 20% of the stream is estimated to be in pools. The stream bottom is composed primarily of rubble, boulders, and bedrock. Cover for fish is good in 45% of the stream. Siltation is light.

Vegetative Conditions: The local watershed has 100% forest cover. Shade or canopy is good over 40% of the stream.

Discussion: Powers (1929) referred to Road Prong as Indian Gap Fork and stated that it had a good population of native brook trout in 1926. King (1937) reported that both brook trout and rainbow trout were in the stream in the mid-1930's and that the upper limit on rainbow trout was around 1,158 m (3,800 ft) elevation. The stream was surveyed by Burrows (1935) in October of 1934. His report did not list what fish species were present at that time but his work did not always include sampling for fish populations in every stream surveyed. He suggested that the stream was best suited to brook trout stocking.

Brook trout and rainbow trout were reported in surveys of Road Prong from 1945 to 1975 (Holloway 1945; Lennon and Parker 1960; Lennon 1967; TWRA 1970b; Kelly et al. 1980; data from National Park files). Stocking records from National Park files show that 9,849 brook trout were stocked in Road Prong from 1937 to 1964 and 1,000 rainbow trout were stocked in 1958.

Both trout species were reported in the stream in 1975. Brook trout were found about 1,061 m (3,480 ft) elevation up to about 1,487 m (4,880 ft) elevation. The stream has approximately 0.6 km (0.4 mi) of sympatric brook/rainbow trout

and about 3.2 km (2.0 mi) of allopatric brook trout water. The allopatric distribution includes one headwater tributary at about 1,442 m (4,730 ft) elevation (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map; data from National Park files).

Road Prong was renovated in the summer of 1978 with a follow-up in the spring of 1979 (Whitworth 1979). Rainbow trout were removed by electroshocking as part of the GSMNP's Brook Trout Recovery Project. The stream should be monitored in the future and a continued effort should be made to remove rainbow trout.

051 Walker Camp Prong (Alum Cave Fork)

Map Location: Mount Le Conte Quadrangle (165-NW) and Clingmans Dome Quadrangle (165-SW). This stream is a tributary to West Prong Little Pigeon River. Its headwaters begin on the northwest side of Mount Kephart near The Jumpoff. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 9.5 km (5.9 mi) of stream is on National Park land.

Elevation:
Mouth - 1,013 m (3,325 ft)
Head - 1,644 m (5,395 ft)

Aspect: West

Stream Size:
Average Width - 4.6 m (15.0 ft)
Width Varies - 0.3 to 12.2 m (1.0 to 40.0 ft)
Average Pool Depth - 0.8 m (2.5 ft)
Average Riffle Depth - 7.6 cm (3.0 in)
Cubic Meters Per Second - 0.23 (7.5 CFS)

Percent Grade: 6.6%

Barriers: 1. Cascades; at about 1,437 m (4,715 ft) elevation

Water Quality: (Determined 18 February 1970 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 12 ppm
Hardness - 17 ppm
M.O. Alkalinity 6 ppm
Temperature - 6°C (42°F)
Siltation - light

(Determined 30 June 1975 at 1,164 m - 3,820 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.4

(Determined above U.S. 441 Highway bridge at 1,372 m - 4,500 ft elevation, from Silsbee and Larson 1981);
pH - 4.6
Alkalinity - 0.0 ppm
Hardness - 5.3 ppm
Conductivity - 15 umhos/cm

(Determined 21 August 1984 at 1,381 m - 4,350 ft elevation):
pH - 5.2
Temperature - 14°C (57°F)

Sources of Pollution: Low pH in the headwaters is due to the natural Anakeesta leachate in the drainage.

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 30 June 1975 by U.S. Fish and Wildlife Service
Number of Rainbow Trout Greater Than 100 mm: 8
Number of Rainbow Trout Less Than 100 mm: 0

July and September 1984 by Broadbent and Bivens
Brook Trout Average Length: 164.1 mm (6.5 in)
Brook Trout Average Weight: 57.7 g (2.1 oz)
Average K Brook Trout Greater Than 100 mm: 1.31
Number of Brook Trout Greater Than 100 mm: 9
Number of Brook Trout Less Than 100 mm:1
Rainbow Trout Average Length: 175.4 mm (6.9 in)
Rainbow Trout Average Weight: 60.0 g (2.1 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.11
Number of Rainbow Trout Greater Than 100 mm: 5
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: Approximately 20% of the stream is estimated to be in pools. The stream bottom is composed primarily of rubble, flat rocks, boulders, and bedrock. Cover for fish is good in 60% of the stream. Siltation is light.

Vegetative Conditions: The local watershed has 100% forest cover. Shade or canopy is good over 40% of the stream.

Discussion: Powers (1939) referred to the main headwater portion of the West Prong Little Pigeon River as Alum Cave Fork. This stream above the confluence with Road Prong is now known as Walker Camp Prong. Powers stated that, in 1926, brook

trout were present in the headwater drainage of Alum Cave Fork (West Prong Little Pigeon River) but seldom occurred below 997 m (3,270 ft) elevation and that the maximum elevation reached by rainbow trout was a little above 1,006 m (3,300 ft). King (1937) reported that the brook trout distribution described by Powers in 1926 had not changed much except that brook trout had become greatly reduced in numbers along the newly completed Newfound Gap Highway (U.S. 441), and that rainbow trout had moved upstream approximately 4.8 km (3.0 mi) by the mid-1930's.

Brook trout and rainbow trout were reported in surveys of Walker Camp Prong from 1945 to 1975 (Holloway 1945; TWRA 1970b; Kelly et al. 1980; data from National Park files). Stocking records from National Park files show that 8,871 brook trout were stocked in Walker Camp Prong from 1940 to 1970. Both brook trout and rainbow trout have been stocked in the West Prong Little Pigeon River over the years from 1937 to 1973. Beginning in 1974, Appalachian strain brook trout from the National Fish Hatchery in Erwin, Tennessee were stocked in the headwater mainstream and tributaries of the West Prong Little Pigeon River (Lennon 1967). Prior to that, New England strain hatchery brook trout were used.

The exact lower limit of brook trout in Walker Camp Prong is somewhat unclear at this writing. Kelly et al. (1980) reported that rainbow trout only were found up to 1,341 m (4,400 ft) elevation and that brook trout only started at 1,426 m (4,680 ft) elevation with the zone between apparently being devoid of both species in 1975. We found brook trout in Walker Camp Prong at Alum Cave Creek at 1,158 m (3,800 ft) elevation and above the U.S. 441 bridge at 1,372 m (4,500 ft) elevation up to 1,430 m (4,690 ft) elevation (Broadbent and Bivens 1984). The brook trout were very scattered above the U.S. 441 bridge and only a few were collected. However, at 1,430 m (4,690 ft) elevation, a tributary junctions to the right off Walker Camp Prong and runs up the southwest side of Mount Kephart (I named this stream Kephart Branch). This stream contains a good to excellent brook trout population and has a higher pH than Walker Camp Prong which is a natural Anakeesta drainage (Silsbee and Larson 1981). Kephart Branch is probably what Kelly et al. (1980) were referring to in the 1975 survey when they stated that brook trout began at 1,42 m (4,680 ft) elevation.

The best estimate we have at this date is that brook trout start at about 1,128 m (3,700 ft) elevation and go up to 1,430 m (4,690 ft) elevation on Walker Camp Prong. The stream has approximatley 4.3 km (2.7 mi) of sympatric brook/rainbow trout and about 2.4 km (1.5 mi) of allopatric brook trout water. However, the numbers of brook trout in the allopatric zone is small and the fish are very scattered.

Walker Camp Prong has some nice pools, fairly low gradient, and little siltation. But, water quality in terms of low pH due to the nature of the watershed is apparently a limiting factor in trout production in the upper stream.

052 Alum Cave Creek

Map Location: Mount Le Conte Quadrangle (165-NW). This stream is a tributary to Walker Camp Prong. Its headwaters begin on the west side of Anakeesta Knob. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 3.1 km (1.9 mi) of stream is on National Park land.

Elevation:
Mouth - 1,161 m (3,810 ft)
Head - 1,536 m (5,040 ft)

Aspect: Southwest

Stream Size:
Average Width - 4.6 m (15.0 ft)
Width Varies - 0.3 to 9.1 m (1.0 to 30.0 ft)
Average Pool Depth - 0.6 m (2.0 ft)
Average Riffle Depth - 7.6 cm (3.0 in)
Cubic Meters Per Second - 0.08 (2.5 CFS)

(Determined 12 September 1984 at the mouth at 1.161 m - 3,810 ft elevation):
Width - 3.0 m (10.0 ft)

Percent Grade: 12.3%

Barriers: None Recorded

Water Quality: (Determined in August and September 1926, from Powers 1929):
pH - varied from 4.1 to 5.8

(Determined in the summer and fall of 1936, from King 1937):
pH - varied from 4.7 to 5.1

(Determined 18 February 1970 by TWRA stream survey):
pH - 5.5
Dissolved Oxygen - 12 ppm
Hardness - 34 ppm

M.O. Alkalinity - 6 ppm
Temperature - 6°C (43°F)
Siltation - light

(Determined 30 June 1975 at 1,189 m - 3,900 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.8

(Determined 30 June 1984 near the mouth):
pH - 6.3

Sources of Pollution: Some siltation from Alum Cave trail.

Other Fish Species Present: None

Fish Collected: 30 June 1975 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 1
Number of Brook Trout Less Than 100 mm: 0

12 September 1984 by Broadbent and Bivens
Brook Trout Average Length: 203.3 mm (8.0 in)
Brook Trout Average Weight: 110.3 g (3.9 oz)
Average K Brook Trout Greater Than 100 mm: 1.31
Number of Brook Trout Greater Than 100 mm: 8
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: Approximately 20% of the stream is estimated to be in pools. The stream bottom is composed primarily of rubble, boulders, and bedrock. Cover for fish is good in 60% of the stream. Siltation is light.

Vegetative Conditions: The local watershed has 100% forest cover. Shade or canopy is good over 35% of the stream.

Discussion: The first documented survey of Alum Cave Creek was by Burrows (1935). His party surveyed the stream in October 1934 but his report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

Powers (1929) stated that brook trout occurred in the Alum Cave Fork down to about 997 m (3,270 ft) elevation. However, the Alum Cave Fork he referred to is actually Walker Camp Prong. King (1937) reported that brook trout were present in Alum Cave Creek in 1936 and he stated that investigations had shown that rainbow trout (Salmo gairdneri) did not enter the stream even though no barrier exists to stop them and that rainbow trout were present in Walker Camp Prong both above and below the mouth of Alum Cave Creek.

Although King (1937) stated that rainbow trout did not enter Alum Cave Creek, all later workers reported that both trout species occurred in the stream (Lennon and Parker 1960; Lennon 1967; TWRA 1970b; Kelly et al. 1980; data from National Park files).

Stocking records from the National Park files show that Alum Cave Creek was stocked with a total of 11,040 brook trout between 1940 and 1964. One thousand brook trout stocked in 1954 were of Appalachian strain from the National Fish Hatchery in Erwin, Tennessee. According to the records, no rainbow trout were ever stocked in the stream.

Brook trout were reported from the stream in 1975 but no fish were found above 1,189 m (3,900 ft) elevation. The U.S. Fish and Wildlife Service checked the stream again in May of 1979 and found only one brook trout. However, their first sample section began at about 1,189 m (3,900 ft) elevation which was above where fish were found in 1975 (Kelly et al. 1980; data from National Park files).

The stream was surveyed in September of this year (Broadbent and Bivens 1984) and brook trout were found from the mouth at 1,161 m (3,810 ft) elevation up to about 1,177 m (3,860 ft) elevation at approximately 0.3 km (0.2 mi) above the mouth. No fish were found above this point and no rainbow trout were collected. The stream apparently has a very small to remnant allopatric brook trout population; however, the fish that were collected were in excellent condition. Their average length was 203.3 mm (8.0 in) and the coefficient of condition (K) was 1.31.

Fish may avoid Alum Cave Creek or move in or out of the stream due to fluctuations in pH (pH values of 4.1 to 6.8 have been reported). Otherwise, stream conditions are good to excellent and good trout habitat exists. It may prove successful to stock brook trout from other streams in the Park in the upper part of the stream, but it is suggested that pH be monitored first. It may be that most of Alum Cave Creek was left devoid of fish from a severe flash flood in 1951 and that the brook trout have never recovered this lost range.

Brook trout collected from Alum Cave Creek were used by Harned (1976) as parent stock for F_1 wild brook trout fingerlings that were stocked in Spruce Flats Branch in 1975. The parent fish were collected in October 1974 and were reported to be some of the largest brook trout ever collected in the Park. Brook trout were established in Spruce Flats Branch as a result of Harned's study and they are most likely progeny of the wild fish from Alum Cave Creek (New England hatchery strain brook trout were also stocked in Spruce Flats Branch during the study).

053 Kephart Branch

Map Location: Mount Le Conte Quadrangle (165-NW). This stream is a headwater tributary to Walker Camp Prong that has no name on the quadrangle map. I have listed it as Kephart Branch in order to separate its brook trout population from Walker Camp Prong and account for its distribution length. It enters Walker Camp Prong at 1,430 m (4,690 ft) elevation and its headwaters begin on the southwest side of Mount Kephart. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.1 km (0.7 mi) of stream is on National Park land.

Elevation:
Mouth - 1,430 m (4,690 ft)
Head - 1,594 m (5,230 ft)

Aspect: West

Stream Size: (Determined at 1,439 m - 4,720 ft elevation):
Width - 2.1 m (7.0 ft)

Percent Grade: 14.6%

Barriers: 1. Cascades; approximately 7.0 m (23.0 ft) vertical height; at about 1,524 m (5,000 ft) elevation.

Water Quality: (Determined 15 July 1971 by U.S. Fish and Wildlife Service survey):
pH - 6.0
Alkalinity - 3 ppm

(Determined 21 August 1984 at 1,439 m - 4,720 ft elevation):
pH - 6.4
pH - 6.9 @ 1,524 m (5,000 ft) elevation
Total Hardness - 7 ppm
Temperature - 13°C (56°F)
Siltation - light

Sources of Pollution: Some slight siltation from very steep surrounding areas where landslides occur.

Other Fish Species Present: None

Fish Collected: 21 August 1984 by Broadbent and Bivens
Brook Trout Average Length: 142.6 mm (5.6 in)
Brook Trout Average Weight: 32.7 g (1.2 oz)

Average K Brook Trout Greater Than 100 mm: 1.13
Number of Brook Trout Greater Than 100 mm: 19
Number of Brook Trout Less Than 100 mm: 3

Stream Conditions: Although the stream is small, good habitat conditions exist. It has approximately 60% riffle areas, 30% pools, and 10% bedrock. Old logs and down trees, along with large boulders help to create pools. The stream bottom is composed of sand and gravel with lots of small to intermediate sized rubble, large flat rocks and many boulders. The overall stream gradient is moderate and siltation is very light.

Vegetative Conditions: The streambank has 100% overstory and understory vegetation made up primarily of yellow birch (Betula alleghaniensis), hemlock (Tsuga canadensis), red spruce (Picea rubens), mountain maple (Acer spicatum), witch hazel (Hamamelis virginiana), dog hobble (Leucothoe editorum), and rhododendron (Rhododendron spp.).

Discussion: This stream was given the name Kephart Branch so that its brook trout population could be delineated separate from Walker Camp Prong. Brook trout were reported in this stream in 1964 and again in 1969 when it was noted that an unusually large number of brook trout were observed. On 27 August 1969, 44 brook trout were collected from a 91 m (300 ft) sample section (data from National Park files). Earlier workers referred to the stream simply as right fork or right prong in data collections of Walker Camp Prong.

The stream was surveyed in August of this year (Broadbent and Bivens 1984) and brook trout were still present. Brook trout were collected from the mouth at 1,430 m (4,690 ft) elevation up to about 1,524 m (5,000 ft) elevation and the stream has about 0.8 km (0.5 mi) of allopatric brook trout water. Although the stream is fairly small, good cover and habitat conditions exist. The stream apparently has a healthy population of brook trout and 3 to 5 brook trout were usually observed in every good pool between sample sites.

Kephart Branch has no natural barriers to prevent upstream movement of fish from Walker Camp Prong. However, Walker Camp Prong is reportedly a natural Anakeesta drainage (Silsbee and Larson 1981) and the stream itself is apparently an "acid barrier" to upstream movement of rainbow trout (Salmo gairdneri). Therefore, Kephart Branch is probably well protected from encroachment of rainbow trout and no specific management is suggested.

054 Dunn Creek (Headwaters)

Map Location: Richardson Cove Quadrangle (164-SW), Jones Cove Quadrangle (164-SE), and Mount Guyot Quadrangle (165-NE). This stream is a tributary to East Fork which is a tributary to Little Pigeon River. Its headwaters begin north of Pinnacle Lead. It is located in Sevier County, Tennessee.

Ownership Pattern: Total length of the stream to its confluence with Wilhite Creek near Crockettsville School is 30.4 km (18.9 mi). Approximately 5.3 km (3.3 mi) of the stream is within the GSMNP. The remaining 25.1 km (15.6 mi) of lower stream runs through private land.

Elevation:
Mouth - 309 m (1,015 ft)
National Park Boundary - 634 m (2,080 ft)
Head - 1,536 m (5,040 ft)

Aspect: Northwest

Stream Size: (near GSMNP boundary)
Average Width - 4.0 m (13.1 ft)

Percent Grade: 17% (headwaters within GSMNP)

Barriers: None Recorded

Water Quality: (Determined 19 July 1978 near GSMNP boundary):
pH - 6.5
Dissolved Oxygen - 11 ppm
Hardness - 17 ppm
Alkalinity 17 ppm
Temperature - 18°C (64°F)
Siltation - light within 0.4 km (0.3 mi) of GSMNP boundary but medium to heavy after that, in the lower stream.

Sources of Pollution: Not Recorded

Other Fish Species Present:
Central stoneroller (*Campostoma anomalum*)
Blacknose dace (*Rhinichthys atratulus*)
Banded sculpin (*Cottus carolinae*)

Fish Collected: June and July 1975 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 26
Number of Brook Trout Less Than 100 mm: 8

19 July 1978 by Whitworth and Strange
Brook Trout Average Length: 163.0 mm (6.4 in)
Brook Trout Average Weight: 40.7 g (1.5 oz)
Average K Brook Trout Greater Than 100 mm: 0.91
Number of Brook Trout Greater Than 100 mm: 3
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: The first documented survey of Dunn Creek was by Burrows (1935). His party surveyed the stream in November 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

Lennon and Parker (1960) listed both brook trout and rainbow trout (Salmo gairdneri) as being present in the stream. However, all other work lists only brook trout present (Lennon 1967; Whitworth and Strange 1979; Kelly et al. 1980; data from National Park files).

An allopatric brook trout population exists from about 567 m (1,860 ft) elevation (Whitworth and Strange 1979) up to about 1,274 m (4,180 ft) elevation in the mainstream and the stream has approximately 6.8 km (4.2 mi) of allopatric brook trout water, this includes 5 tributary streams above 1,158 m (3,800 ft) elevation (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map). Protection of this brook trout resource is the only management suggested.

One interesting note; brook trout from Dunn Creek were used by Harris et al. (1978) of Tennessee Technological University, Tennessee Cooperative Fishery Research Unit in genetic research of brook trout from the Southern Appalachian region by Konopacky (1978) for age and growth analysis, and by Robinette (1978) for life history investigations of GSMNP brook trout.

055 Noisy Creek

Map Location: Jones Cove Quadrangle (164-SE) and Mount Guyot Quadrangle (165-NE). This stream is a tributary to Webb Creek which is a tributary to Little Pigeon River. Its headwaters begin on the north side of Greenbrier Pinnacle. It is located in Sevier County, Tennessee.

Ownership Pattern: The lower 0.3 km (0.2 mi) of stream is on private land, and the remaining 4.3 km (2.7 mi) of stream is on National Park land.

Elevation:
Mouth - 474 m (1,555 ft)
Head - 1,207 m (3,960 ft)

Aspect: North

Stream Size:
Average Width - 1.4 mi (4.5 ft)
Width Varies - 0.3 to 3.7 m (1.0 to 20.0 ft)
Average Pool Depth - 0.5 m (1.5 ft)
Average Riffle Depth - 7.6 cm (3.0 in)
Cubic Meters Per Second - 0.04 (1.3 CFS)

Percent Grade: 16.9%

Barriers: None Recorded

Water Quality: (Determined 26 January 1970 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 13 ppm
Hardness - 17 ppm
M.O. Alkalinity - 6 ppm
Temperature - 6°C (42°F)

(Determined 24 June 1975 by U.S. Fish and Wildlife Service survey):
pH - 7.0
Temperature - 17°C (62°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Blacknose dace (*Rhinichthys atratulus*)

Stream Conditions: Approximately 20% of the stream is estimated to be in pools. The stream bottom is composed of sand, gravel, rubble, boulders, and bedrock. Cover for fish is good in approximately 45% of the stream.

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: This stream was listed by the TWRA (1970b) stream survey report as having both brook trout and rainbow trout (*Salmo gairdneri*) present. However, stream surveys in 1959 and again in 1975 found no trout species present. The stream was stocked in 1944 with 2,997 brook trout (data from GSMNP files).

Since no other trout species are present, and depending on stream and habitat conditions, this stream may be a good candidate for relocating native brook trout from other local streams. If native brook trout could be established here, it would help to extend brook trout range in the Park.

056 Texas Creek

Map Location: Jones Cove Quadrangle (164-SE) and Mount Guyot Quadrangle (165-NE). This stream is a tributary to Webb Creek which is a tributary to Little Pigeon River. Its headwaters begin on the north side of Greenbrier Pinnacle. It is located in Sevier County, Tennessee.

Ownership Pattern: The lower 0.2 km (0.1 mi) of stream is on private land, and the remaining 4.2 km (2.6 mi) of stream is on National Park land.

Elevation:
Mouth - 530 m (1,740 ft)
Head - 1,231 m (4,040 ft)

Aspect: North

Stream Size:
Average Width - 1.2 m (4.0 ft)
Width Varies - 0.3 to 3.7 m (1.0 to 12.0 ft)
Average Pool Depth - 0.5 m (1.5 ft)
Average Riffle Depth - 7.6 cm (3.0 in)
Cubic Meters Per Second - 0.02 (0.6 CFS)

Percent Grade: 16.1%

Barriers: None Recorded

Water Quality: (Determined 26 January 1970 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 13 ppm
Hardness - 17 ppm
M.O. Alkalinity - 6 ppm
Temperature - 6°C (42°F)
Siltation - light

(Determined 26 June 1975 at 640 m - 2,100 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 7.0
Temperature - 17°C (62°F)

Sources of Pollution: Not Recorded

Other Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)
Caddisflies (Trichoptera)

Fish Collected: 26 June 1975 by U.S. Fish and Wildlife Service
Number of Rainbow Trout Greater Than 100 mm: 3
Number of Rainbow Trout Less Than 100 mm: 2

Stream Conditions: Approximately 20% of the stream is estimated to be in pools. The stream bottom is composed primarily of gravel, rubble, boulders, and bedrock. Cover for fish is good in approximately 45% of the stream.

Vegetative Conditions: The local watershed has 100% forest cover. Shade or canopy is good over 40% of the stream.

Discussion: This stream was listed by the TWRA (1970b) stream survey report as having both brook trout and rainbow trout present. However, stream surveys in 1975 found only rainbow trout in the stream (data from GSMNP files). It probably has no future management potential for brook trout due to the established rainbow trout population.

057 Rhododendron Creek

Map Location: Mount Le Conte Quadrangle (165-NW). This stream is a tributary to Little Pigeon River. Its headwaters begin near James Gap northeast of Turkey Rock. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 4.8 km (3.0 mi) of stream is on National Park land.

Elevation:
Mouth - 452 m (1,483 ft)
Head - 811 m (2,660 ft)

Aspect: Northeast

Stream Size:
Average Width - 2.7 m (9.0 ft)
Width Varies - 0.3 to 7.6 m (1.0 to 25.0 ft)
Average Pool Depth - 0.6 m (2.0 ft)
Average Riffle Depth - 7.6 cm (3.0 in)
Cubic Meters Per Second - 0.06 (2.0 CFS)

Percent Grade: 7.4%

Barriers: None Recorded

Water Quality: (Determined 20 February 1970 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 12 ppm
Hardness - 17 ppm
M.O. Alkalinity - 13 ppm
Temperature - 6°C (42°F)
Siltation - light

Sources of Pollution - Not Recorded

Other Species Present:
Rainbow trout (Salmo gairdneri)
Stoneflies (Plecoptera)
Caddisflies (Trichoptera)

Stream Conditions: Approximately 30% of the stream is estimated to be in pools. The stream bottom is composed primarily of rubble, boulders, and bedrock. Cover for fish is good in approximately 20% of the stream.

Vegetative Conditions: The local watershed has 100% forest cover. Shade or canopy is good over 30% of the stream.

Discussion: This stream was listed by the TWRA (1970b) stream survey report as having both brook trout and rainbow trout present. However, stream surveys in 1975 found only rainbow trout throughout the stream (Kelly et al. 1980). It probably has no future management potential for brook trout due to the well established rainbow trout population.

058 Porters Creek

Map Location: Mount Le Conte Quadrangle (165-NW) and Mount Guyot Quadrangle (165-NE). This stream is a tributary to Little Pigeon River. Its headwaters begin west of Porter Gap near Charlies Bunion. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 9.2 km (5.7 mi) of stream is on National Park land.

Elevation:
Mouth - 511 m (1,675 ft)
Head - 1,390 m (4,560 ft)

Aspect: North

Stream Size: (Determined 20 June 1975 at 616 m - 2,020 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 11.0 cm (36.0 ft)

Percent Grade: 9.6%

Barriers: None Recorded

Water Quality: (Determined 20 June 1975 at 616 m - 2,020 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 7.0
Temperature - 16°C (61°F)

Sources of Pollution: Not Recorded

Other Fish Species Present:
Rainbow trout (*Salmo gairdneri*)
Blacknose dace (*Rhinichthys atratulus*)
Longnose dace (*Rhinichthys cataractae*)
Sculpin (*Cottus* spp.)

Fish Collected: June and July 1975 by U.S. Fish and Wildlife Service
Number of Rainbow Trout Greater Than 100 mm: 6
Number of Rainbow Trout Less Than 100 mm: 0

19 May 1980 (data from National Park files)
Rainbow Trout Average Length: 135.7 mm (5.3 in)
Rainbow Trout Average Weight: 46.7 g (1.7 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.06
Number of Rainbow Trout Greater Than 100 mm: 101
Number of Rainbow Trout Less Than 100 mm: 1

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of Porters Creek was by Burrows (1935). His party surveyed the stream in October 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed. King (1937) stated, however, that brook trout once thrived in the Little Pigeon River watershed down to about 488 m (1,600 ft) elevation. He also reported that in September 1925 a severe

fire swept through the headwaters of Porters Creek and the resulting ash and mud slides were thought to have left the headwaters devoid of trout. Porters Creek and its tributaries were also hit by an unusually severe flash flood in 1951 which reportedly killed many trout (Lennon 1954).

The TWRA (1970b) stream survey report listed both brook trout and rainbow trout as the primary species present in Porters Creek. Creel surveys in 1953 (Lennon (1954) also reported both brook trout and rainbow trout present as did other surveys from 1954 to 1960 (data from National Park files; Lennon and Parker 1960; Lennon 1967). However, Porters Creek has a history of stocking brook trout from 1936 to 1973 and 31,000 brook trout were released in the stream over that interval (data from National Park files). No brook trout were found in the stream during 1975 (Kelly et al. 1980) and brook trout reported in 1970 were probably fish that had been stocked that year. The stream now has a well established rainbow trout population throughout and therefore, probably has no future management potential for brook trout.

059 False Gap Prong

Map Location: Mount Le Conte Quadrangle (165-NW) and Mount Guyot Quadrangle (165-NE). This stream is a tributary to Porters Creek. Its headwaters begin near False Gap southwest of Laurel Top. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 5.6 km (3.5 mi) of stream is on National Park land.

Elevation:
Mouth - 544 m (1,785 ft)
Head - 1,530 m (5,020 ft)

Aspect: Northwest

Stream Size: (Determined 24 June 1975 at 768 m - 2,520 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 3.7 m (12.0 ft)

Percent Grade: 17.5%

Barriers: None Recorded

Water Quality: (Determined 24 June 1975 at 768 m - 2,520 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.8
Temperature - 16°C (61°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 24 June 1975 by U.S. Fish and Wildlife Service
Number of Rainbow Trout Greater Than 100 mm: 1
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of False Gap Prong was by Burrows (1935). His party surveyed the stream in November of 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed. King (1937) stated that brook trout once thrived in the Little Pigeon River watershed down to about 488 m (1,600 ft) elevation. He also reported that in September 1925 a severe fire swept through the headwaters of Porters Creek and its tributaries and the resulting ash and mud slides were thought to have left the headwaters devoid of trout. Porters Creek and its tributaries were also hit by an unusually severe flash flood in 1951 which reportedly killed many trout (Lennon 1954).

The TWRA (1970b) stream survey report listed both brook trout and rainbow trout as the primary species present in False Gap Prong. Creel surveys in 1953 (Lennon 1954) also reported a few brook trout and rainbow trout from the stream. However, these were reported to be the results of upstream movement from Porters Creek which was stocked with brook trout in April 1953.

Stream surveys of False Gap Prong in 1957 and 1958 found only rainbow trout present. False Gap Prong was stocked with 720 brook trout in 1938 and another 234 brook trout in 1940 (data from GSMNP files). Also, Porters Creek was stocked with brook trout in 1970 and brook trout reported in False Gap Prong in 1970 may have been the results of upstream movement of these stocked fish. Kelly et al. (1980) reported that only rainbow trout were found in the stream in 1975. This stream probably has no future management potential for brook trout due to the well established rainbow trout populations both in False Gap Prong and the Porters Creek watershed.

060 Kalanu Prong

Map Location: Mount Guyot Quadrangle (165-NE). This stream is a tributary to False Gap Prong which is a tributary to Porters Creek. Its headwaters begin just west of Laurel Top. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 3.1 km (1.9 mi) of stream is on National Park land.

Elevation:
Mouth - 768 m (2,520 ft)
Head - 1,477 m (4,845 ft)

Aspect: Northwest

Stream Size: (Determined 24 June 1975 at 823 m - 2,700 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 4.6 m (15.0 ft)

Percent Grade: 23.2%

Barriers: None Recorded

Water Quality: (Determined 24 June 1975 at 823 m - 2,700 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.5
Temperature - 16°C (61°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 24 June 1975 by U.S. Fish and Wildlife Service
Number of Rainbow Trout Greater Than 100 mm: 10
Number of Rainbow Trout Less Than 100 mm: 4

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The TWRA (1970b) stream survey report listed brook trout as the primary species present in Kalanu Prong. No other documentation of the stream ever having brook trout was found other than that King (1937) stated that the entire Little Pigeon River watershed once thrived with brook trout down to about 488 m (1,600 ft) elevation. Only rainbow trout were

found in the stream during a 1975 survey (data from GSMNP files), and the stream probably has no future management potential for brook trout due to the well established rainbow trout populations both in Kalanu Prong and the Porters Creek watershed.

061 Long Branch

Map Location: Mount Le Conte Quadrangle (165-NW). This stream is a tributary to Porters Creek. Its headwaters begin near Long Branch Gap on the north side of Brushy Mountain. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.9 km (1.8 mi) of stream is on National Park land.

Elevation:
Mouth - 628 m (2,060 ft)
Head - 1,084 m (3,555 ft)

Aspect: East

Stream Size: Not Recorded

Percent Grade: 15.7%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of Long Branch was by Burrows (1935). His party surveyed the stream in November 1934 but the report did not list whether or not any trout species were found. However, his work did not include sampling for fish populations in every stream surveyed. Brook trout were probably there, as King (1937) stated that brook trout once thrived in the Little Pigeon River watershed down to about 488 m (1,600 ft) elevation.

The TWRA (1970b) stream survey report listed both brook trout and rainbow trout as the primary species present in Long Branch. However, Kelly et al. (1980) reported that only rainbow trout were found in the stream in 1975. The brook trout reported in 1970 may have been the results of upstream movement from Porters Creek which was stocked with brook trout in 1970 (data from GSMNP files). This stream probably has no future management potential for brook trout due to well established rainbow trout populations both in Long Branch and the Porters Creek watershed.

062 Cannon Creek

Map Location: Mount Le Conte Quadrangle (165-NW). This stream is a tributary to Porters Creek. Its headwaters begin on the northeast side of Mount Le Conte. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 3.9 km (2.4 mi) of stream is on National Park land.

Elevation:
Mouth - 718 m (2,357 ft)
Head - 1,548 m (5,080 ft)

Aspect: Northeast

Stream Size: (Determined 23 July 1975 at 792 km - 2,600 ft elevation by U.S. Fish and Wildlife Service survey:
Average Width - 5.2 m (17.0 ft)

Percent Grade: 21.5%

Barriers: None Recorded

Water Quality: (Determined 23 July 1975 by U.S. Fish and Wildlife Service survey): At 792 m (2,600 ft) elevation):
pH - 7.0
Temperature 17°C (63°F)
At 951 m (3,120 ft) elevation:
pH - 6.4
Temperature - 16°C (61°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 23 July 1975 by U.S. Fish and Wildlife Service
Number of Rainbow Trout Greater Than 100 mm: 152
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of Cannon Creek was by Burrows (1935). His party surveyed the stream in October 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed. King (1937) stated that brook trout once thrived in the Little River watershed down to about 488 m (1,600 ft) elevation. He also reported that in September 1925 a severe fire swept through the headwaters of Porters Creek and its tributaries and the resulting ash and mud slides were thought to have left the headwaters barren of trout.

The TWRA (1970b) stream survey report listed both brook trout and rainbow trout as the primary species present in Cannon Creek. However, surveys in 1958 found only rainbow trout present and the brook trout reported in 1970 may have been the results of upstream movement from Porters Creek which was stocked with brook trout in 1970 (data from GSMNP files). Kelly et al. (1980) reported that only rainbow trout were found in the stream in 1975. The stream probably has no future management potential for brook trout due to the well established rainbow trout populations both in Cannon Creek and the Porters Creek watershed.

063 Lowes Creek

Map Location: Mount Le Conte Quadrangle (165-NW). This stream is a tributary to Porters Creek. Its headwaters begin on the northeast side of Mount Le Conte east of Myrtle Point. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 3.7 km (2.3 mi) of stream is on National Park land.

Elevation:
Mouth - 753 m (2,470 ft)
Head - 1,536 m (5,040 ft)

Aspect: Northeast

Stream Size: (Determined 23 July 1975 at 756 m - 2,480 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 4.6 m (15.0 ft)

Percent Grade: 21.2%

Barriers: None Recorded

Water Quality: (Determined 23 July 1975 at 756 m - 2,480 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 7.0
Temperature - 16°C (60°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of Lowes Creek was by Burrows (1935). He reported finding only rainbow trout in October 1934. However, King (1937) stated that brook trout once thrived in the Little Pigeon River watershed down to about 488 m (1,600 ft) elevation. He also reported that in September 1925 a severe fire swept through the headwaters of Porters Creek and its tributaries and that the resulting ash and mud slides were thought to have left the headwaters barren of trout.

The TWRA (1970b) stream survey report listed both brook trout and rainbow trout as the primary species present in Lowes Creek. Creel surveys in 1953 (Lennon 1954) also reported a few brook trout and rainbow trout from the stream. However, these may have been the results of upstream movement from Porters Creek which was stocked with brook trout from 1949 through 1953. Porters Creek was also stocked with brook trout in 1970 (data from GSMNP files). Kelly et al. (1980) reported that only rainbow trout were found in the stream in 1975. The stream probably has no future management potential for brook trout due to the well established rainbow trout populations both in Lowes Creek and the Porters Creek watershed.

064 Boulevard Prong

Map Location: Mount Le Conte Quadrangle (165-NW). This stream is a tributary to Porters Creek. Its headwaters begin southeast of Myrtle Point near The Boulevard. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 4.0 km (2.5 mi) of stream is on National Park land.

Elevation:
Mouth - 824 m (2,705 ft)
Head - 1,554 m (5,100 ft)

Aspect: Northeast

Stream Size: Not Recorded

Percent Grade: 18.1%

Barriers: None Recorded

Water Quality: (Determined 23 June 1975 at 924 m - 3,030 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 7.0
Temperature - 14°C (58°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 23 June 1975 by U.S. Fish and Wildlife Service
Number of Rainbow Trout Greater Than 100 mm: 1
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The TWRA (1970b) stream survey report listed both brook trout and rainbow trout as the primary species present in Boulevard Prong. However, stream surveys in 1975 (Kelly et al. 1980) found only a few rainbow trout present.

King (1937) stated that brook trout once thrived in the Little Pigeon River watershed down to about 488 m (1,600 ft) elevation. He also reported that in September 1925 a severe

fire swept through the headwaters of Porters Creek and its tributaries and the resulting ash and mud slides were thought to have left the headwaters devoid of trout. Porters Creek and its tributaries were also hit by an unusually severe flash flood in 1951 which reportedly killed many trout (Lennon 1954).

Brook trout were known to have occurred in Boulevard Prong from 1953-1960 (data from National Park files; Lennon and Parker 1960; Lennon 1967). However, these may have been the results of upstream movement of fish from Porters Creek which was stocked with brook trout during that period. Brook trout reported in 1970 may have also been the results of brook trout stocked in Porters Creek that same year. The stream probably has no future management potential for brook trout due to the firmly established rainbow trout population in the Porters Creek drainage.

065 Middle Prong Little Pigeon River

Map Location: Mount Le Conte Quadrangle (165-NW) and Mount Guyot Quadrangle (265-NE). This stream is a tributary to Little Pigeon River. Its headwaters begin with the confluence of Chapman Prong and Lost Prong at about 988 m (3,240 ft) elevation. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 7.7 km (4.8 mi) of stream is on National Park land.

Elevation:
Mouth - 491 m (1,610 ft)
Head - 998 m (3,240 ft)

Aspect: Northwest

Stream Size:
Average Width - 6.1 m (20.0 ft)
Width Varies - up to 15.2 m (up to 50.0 ft)
Average Pool Depth - 0.9 m (3.0 ft)
Average Riffle Depth - 10.2 cm (4.0 in)
Cubic Meters Per Second - 0.45 (15.0 CFS)

Percent Grade: 6.4%

Barriers:
1. Cascades; at about 850 m (2,790 ft) elevation
2. Cascades; at about 945 m (3,100 ft) elevation
3. Cascades; at about 975 m (3,200 ft) elevation

Water Quality: (Determined 20 February 1970 by TWRA stream survey):

pH - 6.8
Dissolved Oxygen - 13 ppm
Temperature - 5°C (41°F)
Siltation - light

(Determined 20 June 1975 at 604 m - 1,980 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 7.0
Temperature - 16°C (69°F)

Sources of Pollution: Not Recorded

Other Species Present:

Rainbow trout (Salmo gairdneri)
Longnose dace (Rhinichthys cataractae)
Stoneflies (Plecoptera)
Caddisflies (Trichoptera)

Stream Conditions: Approximately 20% of the stream is estimated to be in pools. The stream bottom is composed primarily of rubble, boulders, and bedrock. Cover for fish is good in approximately 30% of the stream.

Vegetative Conditions: The local watershed has 100% forest cover. Shade or canopy is good over 35% of the stream.

Discussion: The Middle Prong Little Pigeon River has had a varied history of trout stocking. A total of 18,228 brook trout were stocked from 1936 to 1973 and 110,886 rainbow trout were stocked from 1936 to 1974 (data from National Park files). Originally, native brook trout were known to thrive down to about 488 m (1,600 ft) elevation in this watershed (King 1937). By the mid to late 1950's, about 853 m (2,800 ft) was the minimum elevation at which brook trout were found (Lennon 1967). Lennon and Parker (1960) listed both brook trout and rainbow trout present, and the TWRA (1970b) stream survey report also listed both species present in the stream.

Kelly et al. (1980) reported that brook trout were still present in the stream in 1975. Brook trout were found from about 732 m (2,400 ft) elevation up to 988 m (3,240 ft) elevation and the stream has 3.1 km (1.9 mi) of sympatric brook/rainbow trout and only about 0.2 km (0.1 mi) of allopatric brook trout water (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map).

For all practical purposes the Middle Prong Little Pigeon River has only a sympatric brook/rainbow trout population. However, this resource is well worth protecting and it may be of great value to renovate the upper part of this stream as its headwater tributaries also have brook trout populations.

066 Ramsay Prong

Map Location: Mount Guyot Quadrangle (165-NE). This stream is a tributary to Middle Prong Little Pigeon River. Its headwaters begin on the north side of Mount Guyot. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 0.8 km (5.0 mi) of stream is on National Park land.

Elevation:
Mouth - 799 m (2,620 ft)
Head - 1,902 m (6,240 ft)

Aspect: West

Stream Size: (Determined 24 June 1975 at 902 m - 2,960 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 8.2 m (27.0 ft)

Percent Grade: 13.7%

Barriers: 1. Ramsay Cascades; at about 1,341 m (4,400 ft) elevation.

Water Quality: (Determined 24 June 1975 by U.S. Fish and Wildlife Service survey):
pH - 7.0 @ 902 m (2,960 ft) elevation
pH - 6.5 @ 1,061 m (3,480 ft) elevation
Temperature - 16°C (60°F) @ 902 m (2,960 ft) elevation

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of Ramsay Prong was by Burrows (1935). His party surveyed the stream in November 1934

but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed. King (1937) stated, however, that brook trout once thrived in the Little Pigeon River watershed down to about 488 m (1,600 ft) elevation.

A total of 32,192 brook trout were stocked in Ramsay Prong from 1940 to 1970, and both brook trout and rainbow trout occurred in the stream from 1953 to 1960 (Lennon 1954, 1967; Lennon and Parker 1960; data from National Park files). The TWRA (1970b) stream survey report listed both trout species present and Kelly et al. (1980) reported that both species were found in the stream in 1975.

Brook trout were found from the mouth at 799 m (2,620 ft) elevation up to about 914 m (3,000 ft) elevation and the stream has approximately 1.0 km (0.6 mi) of sympatric brook/rainbow trout and no allopatric brook trout water. The upper stream is apparently devoid of trout. No specific management is suggested.

067 Buck Fork

Map Location: Mount Guyot Quadrangle (165-NE). This stream is a tributary to Middle Prong Little Pigeon River. Its headwaters begin just west of Tricorner Knob. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 6.1 km (3.8 mi) of stream is on National Park land.

Elevation:
Mouth - 866 m (2,840 ft)
Head - 1,622 m (5,320 ft)

Aspect: West

Stream Size: (Determined 20 June 1975 at 878 m - 2,880 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 6.1 m (20.0 ft)

Percent Grade: 12.4%

Barriers: 1. Falls; approximately 3.0 m (10.0 ft) vertical height; at about 1,164 m (3,820 ft) elevation.

Water Quality: (from King 1937)
pH - 6.2 @ 1,372 m (4,500 ft) elevation on 22 August 1936

(Determined 20 June 1975 at 878 m - 2,880 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.6
Temperature - 12°C 54°F)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 20 June 1975 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 15
Number of Brook Trout Less Than 100 mm: 1
Number of Rainbow Trout Greater Than 100 mm: 12
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The first documented survey of Buck Fork was by Burrows (1935). His party surveyed the stream in November 1934 but the report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed. King (1937) reported that both brook trout and rainbow trout were present in the stream in 1936.

Both brook trout and rainbow trout occurred in the stream from 1953 to 1960 (Lennon and Parker 1960; Lennon 1967). The TWRA (1970b) stream survey report also listed both trout species present, and Kelly et al. (1980) reported that both species were found in the stream in 1975.

Brook trout were found from the mouth at 866 m (2,840 ft) elevation up to about 1,536 m (5,040 ft) elevation and the stream has approximately 2.1 km (1.3 mi) of sympatric brook/rainbow trout in the lower stream and about 3.7 km (2.3 mi) of allopatric brook trout water. Rainbow trout are found in the stream up to 1,164 m (3,820 ft) elevation where a natural falls is a barrier to upstream movement (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map). Therefore, this population appears well protected, but renovation of the lower stream may be a management option worth considering.

068 Eagle Rocks Prong

Map Location: Mount Guyot Quadrangle (165-NE). This stream is a tributary to Middle Prong Little Pigeon River. Its headwaters begin northwest of Eagle Rocks. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 4.5 km (2.8 mi) of stream is on National Park land.

Elevation:
Mouth - 907 m (2,975 ft)
Head - 1,500 m (4,920 ft)

Aspect: Northwest

Stream Size: (Determined 20 June 1975 at 914 m - 3,000 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 4.6 m (15.0 ft)

Percent Grade: 13.2%

Barriers: 1. Falls; at about 927 m (3,040 ft) elevation

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri) - at mouth only

Fish Collected: 20 June 1975 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 5
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: The earliest documentation of brook trout in Eagle Rocks Prong was by King (1937) in 1936. At that time he also reported that rainbow trout were present near the mouth but below the falls. He later stated that brook trout appeared to be firmly established in this stream (King 1940).

Both brook trout and rainbow trout occurred in the stream from 1953 to 1960 (Lennon and Parker 1960; Lennon 1967). The TWRA (1970b) stream survey report also listed both trout species present, and Kelly et al. (1980) reported that both species were found in the stream in 1975.

Brook trout were found from the mouth at 907 m (2,975 ft) elevation up to about 1,378 m (4,520 ft) elevation and the stream has about 0.2 km (0.1 mi) of sympatric brook/rainbow trout near the mouth and about 4.2 km (2.6 mi) of allopatric brook trout water. This distribution includes all the smaller tributaries while three of the larger tributaries are discussed separately (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map). Rainbow trout are found in the stream up to 927 m (3,040 ft) elevation where a natural falls is a barrier to upstream movement. Therefore, this population appears well protected and no specific management is suggested.

Eagle Rocks Prong has been used in recent studies of Southern Appalachian brook trout biology. Native brook trout from Eagle Rocks Prong were used by Harris et al. (1978) of Tennessee Technological University, Tennessee Cooperative Fishery Research Unit in genetic research of brook trout from the Southern Appalachian region. Konopacky (1978) also used fish from Eagle Rocks Prong in age and growth studies.

069 Laurel Top Branch

Map Location: Mount Guyot Quadrangle (165-NE). This stream is a tributary to Eagle Rocks Prong. It has no name on the quadrangle map and I have listed it as Laurel Top Branch in order to separate the brook trout population from that of Eagle Rocks Prong and account for its distribution length. It enters Eagle Rocks Prong at approximately 1,164 m (3,820 ft) elevation and its headwaters begin approximately 0.5 km (0.3 mi) northeast of Laurel Top. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on National Park land.

Elevation:
Mouth - 1,164 m (3,820 ft)
Head - 1,573 m (5,160 ft)

Aspect: Northeast

Stream Size: Not Recorded

Percent Grade: 19.5%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: This stream was given the name Laurel Top Branch so that its brook trout population could be delineated from that of Eagle Rocks Prong. No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Middle Prong Little River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,164 m (3,820 ft) elevation up to about 1,451 m (4,760 ft) elevation at approximately 1.6 km (1.0 mi) above the mouth, and also up the right fork tributary for another 0.3 km (0.2 mi). All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

070 Copper Gap Branch

Map Location: Mount Guyot Quadrangle (165-NE). This stream is a tributary to Eagle Rocks Prong. It has no name on the quadrangle map and I have listed it as Copper Gap Branch in order to separate the brook trout population from that of Eagle Rocks Prong and account for its distribution length. It enters Eagle Rocks Prong at approximately 1,230 m (4,035 ft) elevation and its headwaters begin approximately 0.5 km (0.3 mi) west of Copper Gap. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.6 km (1.0 mi) of stream is on National Park land.

Elevation:
Mouth - 1,230 m (4,035 ft)
Head - 1,460 m (4,790 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 14.3%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: This stream was given the name Copper Gap Branch so that its brook trout population could be delineated separate from that of Eagle Rocks Prong. No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Middle Prong Little Pigeon River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,230 m (4,035 ft) elevation up to about 1,402 m (4,600 ft) elevation at approximately 1.4 km (0.9 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

071 Pecks Branch

Map Location: Mount Guyot Quadrangle (165-NE). This stream is a tributary to Eagle Rocks Prong. It has no name on the quadrangle map and I have listed it as Pecks Branch in order to separate the brook trout population from that of Eagle Rocks Prong and account for its distribution length. It enters Eagle Rocks Prong at approximately 1,248 m (4,095 ft) elevation and its headwaters begin approximately 0.3 km (0.2 mi) north of Pecks Corner. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.6 km (1.0 mi) of stream is on National Park land.

Elevation:
Mouth - 1,248 m (4,095 ft)
Head - 1,500 m (4,920 ft)

Aspect: North

Stream Size: Not Recorded

Percent Grade: 15.6%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: The stream was given the name Pecks Branch so that its brook trout population could be delineated separate from that of Eagle Rocks Prong. No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Middle Prong Little Pigeon River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,248 m (4,095 ft) elevation up to about 1,402 m (4,600 ft) elevation at approximately 1.1 km (0.7 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

072 Lost Prong

Map Location: Mount Guyot Quadrangle (165-NE). This stream is a tributary to Middle Prong Little Pigeon River. Its headwaters begin northwest of Mount Sequoyah. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on National Park land.

Elevation:
Mouth - 988 m (3,240 ft)
Head - 1,457 m (4,780 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 22.4%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: None

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: Brook trout, along with rainbow trout (Salmo gairdneri) were reported present in Lost Prong from 1953 to 1960 (Lennon and Parker 1960; Lennon 1967). However, Kelly et al. (1980) found only brook trout present in this stream in 1975. Brook trout were found from the mouth at 988 m (3,420 ft) elevation up to about 1,292 m (4,240 ft) elevation and the stream has approximately 1.6 km (1.0 mi) of allopatric brook trout water (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map). Protection and monitoring of this population is the only management suggested.

073 Chapman Prong

Map Location: Mount Guyot Quadrangle (165-NE). This stream is a tributary to Middle Prong Little Piegon River. Its headwaters begin northwest of Mount Chapman and south of Chapman Lead. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 3.1 km (1.9 mi) of stream is on National Park land.

Elevation:
Mouth - 988 m (3,240 ft)
Head - 1,500 m (4,920 ft)

Aspect: West

Stream Size: Not Recorded

Percent Grade: 16.7%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: None

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has 100% forest cover.

Discussion: Lennon and Parker (1960), and Lennon (1967) reported both brook trout and rainbow trout (Salmo gairdneri) present in Chapman Prong from 1953 to 1960. TWRA (1970b) stream survey report also listed both species present in the stream. However, Kelly et al. (1980) found only brook trout present in this stream in 1975. Brook trout were found from the mouth at 988 m (3,240 ft) elevation up to about 1,042 m (4,600 ft) elevation and the stream has approximately 2.6 km (1.6 mi) of allopatric brook trout water (Kelly et al. 1980; GSMNP 1972 -1977 brook trout distribution map). Protection and monitoring of this population is the only management suggested.

074 Sequoyah Branch

Map Location: Mount Guyot Quadrangle (165-NE). This stream is a tributary to Chapman Prong. It has no name on the quadrangle map and I have listed it as Sequoyah Branch in order to separate the brook trout population from that of Chapman Prong and account for its distribution length. It enters Chapman Prong at approximately 1,244 m (4,080 ft) elevation and its headwaters begin approximately 0.6 km (0.4 mi) west of Mount Chapman. It is located in Sevier County, Tennessee.

Ownership Pattern: The entire 1.4 km (0.9 mi) of stream is on National Park land.

Elevation:

Mouth - 1,244 m (4,080 ft)
Head - 1,585 m (5,200 ft)

Aspect: West

Stream Size: Not Recorded

Percent Grade: 23.6%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: This stream was given the name Sequoyah Branch so that its brook trout population could be delineated separate from that of Chapman Prong. No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Middle Prong Little Pigeon River Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,244 m (4,080 ft) elevation up to about 1,439 m (4,270 ft) elevation at about 1.0 km (0.6 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

075 Cosby Creek (Headwaters)

Map Location: Newport Quadrangle (173-NW), Hartford Quadrangle (173-SW), and Luftee Knob Quadrangle (174-NW). This stream is a tributary to the Pigeon River. Its headwaters begin on the southwest side of Rocky Face Mountain north of Low Gap. The stream is located in Cocke County, Tennessee.

Ownership Pattern: Total length of the stream is approximately 22.4 km (13.9 mi). About 6.6 km (4.1 mi) of the stream is within the GSMNP, and the remaining 15.8 km (9.8 mi) of lower stream runs through private land.

Elevation:
National Park boundary - 504 m (1,155 ft)
Head - 1,219 m (4,000 ft)

Aspect: North

Stream Size: (Determined near the mouth of Toms Creek at 616 m - 2,020 ft) elevation):
Average Width - 7.6 m (25.0 ft)

Percent Grade: 10.8% (headwaters within GSMNP)

Barriers: None Recorded

Water Quality: (Determined 28 July 1970 at the National Park boundary at 504 - 1,655 ft elevation):
pH - 6.5
Dissolved Oxygen - 10
Temperature - 18°C (65°F)

(Determined 26 June 1975 at 616 m - 2,020 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 7.0
Temperature - 18°C (65°F)

(Determined 12 July 1983 at 671 m - 2,200 ft elevation):
pH - 6.7
Dissolved Oxygen - 7.2 ppm

Sources of Pollution: Not Recorded

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Brown trout (Salmo trutta) - only two collected on 15 June 1980 at about 640 m - (2,100 ft) elevation.
Northern hog sucker (Hypentelium nigricans)
Warpaint shiner (Notropis coccogenis)
Central stoneroller (Campostoma anomalum)
Greenside darter (Etheostoma blennioides)
Longnose dace (Rhinichthys cataractae)
Blacknose dace (Rhinichthys atratulus)
Sculpin (Cottus spp.)

Fish Collected: June 1978 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 26
Number of Brook Trout Less Than 100 mm: 5
Number of Rainbow Trout Greater Than 100 mm: 21
Number of Rainbow Trout Less Than 100 mm: 10

15 May 1980, data from National Park files
Brook Trout Average Length: 167.6 mm (6.6 in)
Brook Trout Average Weight: 44.4 g (1.6 oz)
Average K Brook Trout Greater Than 100 mm: 0.81
Number of Brook Trout Greater Than 100 mm: 5
Number of Brook Trout Less Than 100 mm: 1
Rainbow Trout Average Length: 183.6 mm (7.2 in)
Rainbow Trout Average Weight: 60.2 g (2.3 oz)
Average K Rainbow Trout Greater Than 100 mm: 0.92
Number of Rainbow Trout Greater Than 100 mm: 22
Number of Rainbow Trout Less Than 100 mm: 1

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: The first documented survey of Cosby Creek was by Burrows (1935). His party surveyed the stream in October 1934 but his report did not list whether or not any trout species were found. His work did not include sampling for fish populations in every stream surveyed.

Stocking records from the National Park files show that 10,540 brook trout were stocked in Cosby Creek from 1940 to 1973. Beginning in 1954, the stream was stocked with Appalachian strain brook trout from the National Fish Hatchery in Erwin, Tennessee. Prior to that, stocked brook trout were progeny of New England hatchery strain fish. A total of 20,620 rainbow trout were liberated in the stream between 1944 and 1973.

Both brook trout and rainbow trout were reported in surveys of Cosby Creek from 1945 to 1975 (Holloway 1945; Lennon and Parker 1960; Lennon 1967; Kelly et al. 1980; data from National Park files). The TWRA (1968b) stream survey report listed only rainbow trout and rock bass (Ambloplites rupestris) in the stream. This was probably based on surveys from the lower stream outside the Park. Hoff and Morgan (1976) used fish from Cosby Creek to study age structure of brook trout.

The exact lower limit of brook trout in Cosby Creek is somewhat unclear at this writing. However, brook trout have been collected from Cosby Creek near the mouth of Toms Creek at about 616 m (2,020 ft) elevation. Brook trout were documented as low as 640 m (2,100 ft) elevation in 1980 and 707 m (2,320 ft) elevation in 1984 (data from National Park files). The upper limit of brook trout is about 1,061 m (3,480 ft) elevation and the stream has approximately 2.4 km (1.5 mi) of sympatric brook/rainbow trout and about 1.3 km (0.8 mi) of allopatric brook trout water. The allopatric distribution includes two headwater tributaries above 975 m (3,200 ft) elevation (GSMNP 1972-1977 brook trout distribution map). The Park Service is currently engaged in renovation of the sympatric zone of Cosby Creek. Therefore, no management is suggested at this time.

076 Indian Camp Creek

Map Location: Hartford Quadrangle (173-SW), Jones Cove Quadrangle (164-SE), and Mount Guyot Quadrangle (165-NE). This stream is a tributary to Cosby Creek. Its headwaters begin on the north side of Pinnacle Lead northwest of Old Black. The stream is located in Cocke County, Tennessee.

Ownership Pattern: Total stream length is 11.7 km (7.3 mi). Approximately 5.5 km (3.4 mi) of the upper stream is within the GSMNP, and the remaining 6.3 km (3.9 mi) of lower stream runs through private land.

Elevation:
Mouth - 426 m (1,398 ft)
Head - 1,524 m (5,000 ft)

Aspect: Northeast

Stream Size:
Average Width - 3.0 m (10.0 ft)
Width Varies - 1.8 to 6.1 m (6.0 to 20.0 ft)
Average Pool Depth - 0.5 m (1.5 ft)
Average Riffle Depth - 15.2 cm (6.0 in)

Percent Grade: 9.3%

Barriers: None Recorded

Water Quality: (Determined 7 June 1968 by TWRA stream survey):
pH - 7.8
Dissolved Oxygen - 10 ppm
Hardness - 34 ppm
M.O. Alkalinity - 17 ppm
Temperature - 15°C (59°F)

(Determined 19 July 1979 at 543 m - 1,780 ft elevation, from Whitworth and Strange 1979)
pH - 7.0
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
Alkalinity - 34 ppm
Temperature - 17°C (63°F)
Siltation - light

Sources of Pollution: None Recorded

Other Fish Species Present:
Rainbow trout (*Salmo gairdneri*)
Sculpin (*Cottus* spp.)
Dace (*Rhinichthys* spp.)

Fish Collected: 26 June 1975 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 3
Number of Brook Trout Less Than 100 mm: 13

Stream Conditions: Cover for fish is good in about 75% of the stream and about average in the remaining 25%. About 30% of the stream is estimated to be in pools. The stream bottom is mostly coarse gravel, small rubble, and a few boulders.

Vegetative Conditions: Shade or canopy is good over approximately 95% of the stream. The watershed has about 75% timber, 20% pasture, and 5% in cultivation (lower stream). The stream outside the GSMNP is fairly open and surrounded mainly by hardwood trees.

Discussion: The earliest documentation of brook trout in Indian Camp Creek was by King (1940). He stated that at the time, the stream appeared to have a well established native brook trout population.

Stocking records from the National Park files show that 6,920 brook trout were stocked in Indian Camp Creek from 1937 to 1944. Only brook trout were reported to occur in the stream from 1953 to 1959 (Lennon 1967; data from National Park files). Both brook trout and rainbow trout were listed in the stream in the 1960's (Lennon and Parker 1960; TWRA 1968b). Kelly et al. (1980) also reported that both trout species were found in the stream in 1975, and Whitworth and Strange (1979) found only rainbow trout outside the GSMNP boundary on private land (information from their field notes).

In 1975, brook trout were found from about 658 m (2,160 ft) elevation up to about 1,353 m (4,440 ft) elevation. The stream has approximately 0.3 km (0.2 mi) of sympatric brook/rainbow trout and about 4.3 km (2.7 mi) of allopatric brook trout water. The allopatric distribution includes three headwater tributaries above 1,219 m (4,000 ft) elevation (Kelly et al. 1980; GSMNP 1972-1977 brook trout distribution map). No natural barriers are in the stream and rainbow trout occur in the lower section near the Park boundary. Therefore, the stream should be monitored in the future to assess rainbow trout encroachment. Construction of a man-made barrier and/or removal of rainbow trout should also be considered.

One interesting note; brook trout from Indian Camp Creek were used by Harris et al. (1978) of Tennessee Technological University, Tennessee Cooperative Fishery Research Unit in genetic research of brook trout from the Southern Appalachian region, by Konopacky (1978) for age and growth analysis and by Robinette (1978) for life history investigations of GSMNP brook trout.

077 Otter Creek

Map Location: Mount Guyot Quadrangle (165-NE) and Luftee Knob Quadrangle (174-NW). This stream is a tributary to Indian Camp Creek. Its headwaters begin west of Inadu Knob. It is located in Cocke County, Tennessee.

Ownership Pattern: The entire 2.3 km (1.4 mi) of stream is on National Park land.

Elevation:
Mouth - 1,012 m (3,320 ft)
Head - 1,536 m (5,040 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 23.3%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Cosby Creek Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,012 m (3,320 ft) elevation up to about 1,341 m (4,400 ft) elevation at about 1.6 km (1.0 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

078 Copperhead Branch

Map Location: Mount Guyot Quadrangle (165-NE). This stream is a tributary to Indian Camp Creek. Its headwaters begin northwest of Deer Creek Gap. It is located in Cocke County, Tennessee.

Ownership Pattern: The entire 1.8 km (1.1 mi) of stream is on National Park land.

Elevation:
Mouth - 1,097 m (3,600 ft)
Head - 1,670 m (5,480 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 32.4%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Cosby Creek Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,097 m (3,600 ft) elevation up to about 1,280 m (4,200 ft) elevation at about 0.8 km (0.5 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

079 Toms Creek

Map Location: Hartford Quadrangle (173-SW). This stream is a tributary to Cosby Creek. Its headwaters begin on the west side of Cammerer Ridge. It is located in Cocke County, Tennessee.

Ownership Pattern: The entire 3.9 km (2.4 mi) of stream is on National Park land.

Elevation:
Mouth - 620 m (2,035 ft)
Head - 1,329 m (4,360 ft)

Aspect: Northwest

Stream Size: (Determined 26 June 1975 at 622 m - 2,040 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 3.7 m (12.0 ft)

Percent Grade: 18.3%

Barriers: None Recorded

Water Quality: (Determined 26 June 1975 at 622 m - 2,040 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 6.5
Temperature - 17°C (62°F)

Sources of Pollution: Not Recorded

Other Fish Species Present:
Rainbow trout (*Salmo gairdneri*)
Longnose dace (*Rhinichthys cataractae*)

Fish Collected: 26 June 1975 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 16
Number of Brook Trout Less Than 100 mm: 14

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: No previous documentation of brook trout being present in Toms Creek was found other than that Holloway (1945) stated that a few native brook trout occurred in the headwaters of Cosby Creek (Toms Creek is a tributary to Cosby Creek). Kelly et al. (1980) reported that both brook and rainbow trout were found in the stream in 1975. Brook trout were found from the mouth at 620 m (2,035 ft) elevation and the stream has about 0.2 km (0.1 mi) of sympatric brook/rainbow trout near the mouth and approximately 3.1 km (1.9 mi) allopatric brook trout water (GSMNP 1972-1977 brook trout distribution map). Future management of this stream should include a rainbow trout removal program.

080 Sunup Branch

Map Location: Hartford Quadrangle (173-SW) and Luftee Knob Quadrangle (174-NW). This stream is a tributary to Toms Creek. It has no name on the quadrangle map and I have listed it as Sunup Branch in order to separate the brook trout population from that of Toms Creek and account for its distribution length. It enters Toms Creek at approximately 835 m (2,800 ft) elevation and its headwaters begin on the northwest side of Sunup Knob. It is located in Cocke County, Tennessee.

Ownership Pattern: The entire 1.9 km (1.2 mi) of stream is on National Park land.

Elevation:
Mouth - 853 m (2,800 ft)
Head - 1,329 m (4,360 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 24.6%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: This stream was given the name Sunup Branch so that its brook trout population could be delineated separate from that of Toms Creek. No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Cosby Creek Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 853 m (2,800 ft) elevation up to about 1,973 m (3,520 ft) elevation at about 0.6 km (0.4 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

081 Panther Branch

Map Location: Hartford Quadrangle (173-SW). This stream is a tributary to Toms Creek, which is a tributary to Cosby Creek. Its headwaters begin on the west side of Cammerer Ridge just south of Rich Butt Mountain. It is located in Cocke County, Tennessee.

Ownership Pattern: The entire 1.0 km (0.6 mi) of stream is on National Park land.

Elevation:
Mouth - 963 m (3,160 ft)
Head - 1,244 m (4,080 ft)

Aspect: West

Stream Size: Not Recorded

Percent Grade: 29.0%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Cosby Creek Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 963 m (3,160 ft) elevation up to about 1,067 m (3,500 ft) elevation at about 0.5 km (0.3 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

082 Rock Creek

Map Location: Hartford Quadrangle (173-SW) and Luftee Knob Quadrangle (174-NW). This stream is a tributary to Cosby Creek. Its headwaters begin on the west side of Camel Hump Mountain just northwest of Camel Hump Knob. It is located in Cocke County, Tennessee.

Ownership Pattern: The entire 3.9 km (2.4 mi) of stream is on National Park land.

Elevation:
Mouth - 623 m (2,045 ft)
Head - 1,378 m (4,520 ft)

Aspect: Northeast

Stream Size: (Determined 25 June 1975 at 658 m - 2,160 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 3.7 m (12.0 ft)

Percent Grade: 19.5%

Barriers: 1. Cascades; near mouth at about 634 m (2,080 ft) elevation; may serve as a fish barrier.

Water Quality: (Determined 25 June 1975 at 658 m - 2,160 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 7.0
Temperature - 18°C (65°F)

Sources of Pollution - Not Recorded

Other Fish Species Present:
Rainbow trout (*Salmo gairdneri*)
Dace (*Rhinichthys* spp.)
Sculpin (*Cottus* sp.)

Fish Collected: 25 June 1975 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 6
Number of Brook Less Than 100 mm: 1

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: No previous documentation of brook trout being present in Rock Creek was found other than that Holloway (1945) stated that a few native brook trout occurred in the headwaters of Cosby Creek (Rock Creek is a tributary to Cosby Creek). Kelly et al.(1980) reported that both brook trout and rainbow trout were found in the stream in 1975. Brook trout were found from the mouth at 623 m (2,045 ft) elevation up to about 1,183 m (3,880 ft) elevation and the stream has about 0.2 km (0.1 mi) of sympatric brook/rainbow trout near the mouth and approximately 2.6 km (1.6 mi) allopatric brook trout water (GSMNP 1972-1977 brook trout distribution map). A cascades area near the mouth at 634 m (2,080 ft) elevation apparently serves as a barrier to upstream movement of rainbow trout. Therefore, no special management is suggested other than periodic monitoring of the brook trout population.

083 Little Rock Creek

Map Location: Luftee Knob Quadrangle (174-NW). This stream is a tributary to Rock Creek, which is a tributary to Cosby Creek. Its headwaters begin on the southeast side of Inadu Mountain just northeast of Inadu Knob. It is located in Cocke County, Tennessee.

Ownership Pattern: The entire 1.8 km (1.1 mi) of stream is on National Park land.

Elevation:
Mouth - 963 m (3,160 ft)
Head - 1,463 m (4,800 ft)

Aspect: Northeast

Stream Size: Not Recorded

Percent Grade: 28.2%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: None Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Cosby Creek Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 963 m (3,160 ft) elevation up to about 1,329 m (4,360 ft) elevation at about 1.4 km (0.9 mi) above the mouth (includes left fork tributary). All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

084 Middle Branch

Map Location: Luftee Knob Quadrangle (174-NW). This stream is a tributary to Little Rock Creek, which is a tributary to Rock Creek. It has no name on the quadrangle map and I have listed it as Middle Branch in order to separate the brook trout population from that of Little Rock Creek and account for its distribution length. It enters Little Rock Creek at approximately 1,067 m (3,500 ft) elevation and its headwaters begin approximately 0.8 km (0.5 mi) northwest of Camel Hump Knob. It is located in Cocke County, Tennessee.

Ownership Pattern: The entire 1.3 km (0.8 mi) of stream is on National Park land.

Elevation:
Mouth - 1,067 m (3,500 ft)
Head - 1,512 m (4,960 ft)

Aspect: Northeast

Stream Size: Not Recorded

Percent Grade: 34.6%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: This stream was given the name Middle Branch so that its brook trout population could be delineated separate from that of Little Rock Creek. No historical data is available on this stream and it was probably surveyed in 1975 along with other streams in the Cosby Creek Watershed (Kelly et al. 1980). An allopatric brook trout population exists from the mouth at 1,067 m (3,500 ft) elevation up to about 1,353 m (4,440 ft) elevation at approximately 0.8 km (0.5 mi) above the mouth. All information on this stream came from the 1972-1977 brook trout distribution map at the National Park Headquarters in Gatlinburg, Tennessee.

085 Camel Hump Creek

Map Location: Luftee Knob Quadrangle (174-NW). This stream is a tributary to Cosby Creek. Its headwaters begin on the east side of Camel Hump Mountain northeast of Camel Hump Knob. It is located in Cocke County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on National Park land.

Elevation:
Mouth - 828 m (2,717 ft)
Head - 1,244 m (4,080 ft)

Aspect: Northeast

Stream Size: (Determined 25 June 1975 at 878 m - 2,880 ft elevation by U.S. Fish and Wildlife Service survey):
Average Width - 2.3 m (7.5 ft)

Percent Grade: 19.9%

Barriers: None Recorded

Water Quality: (Determined 25 June 1975 at 878 m - 2,880 ft elevation by U.S. Fish and Wildlife Service survey):
pH - 7.0
Temperature - 14°C (58°F)

(Silsbee and Larson 1983):
pH - 5.98 (Mean value for biweekly samples for sample period 2 November 1978 to 2 December 1980)
Temperature - 9.8^{o}C (49.6^{o}F) - (Mean value for biweekly samples for sample period 21 November 1978 to 2 December 1980)

Conductivity - 18.2 umhos/cm (Mean value for biweekly samples for sample period 21 November 1978 to 2 December 1980)

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 25 June 1975 by U.S. Fish and Wildlife Service
Number of Brook Trout Greater Than 100 mm: 3
Number of Brook Trout Less Than 100 mm: 3

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: No previous documentation of brook trout being present in Camel Hump Creek was found other than that Holloway (1945) stated that a few native brook trout occurred in the headwaters of Cosby Creek (Camel Hump Creek is a headwater tributary to Cosby Creek). Kelly et al. (1980) reported that both brook trout and rainbow trout were found in the stream in 1975. Brook trout were found from the mouth at 828 m (2,717 ft) elevation up to about 1,131 m (3,710 ft) elevation and the stream has about 0.2 km (0.1 mi) of sympatric brook/rainbow trout near the mouth and approximately 1.4 km (0.9 mi) of allopatric brook trout water (GSMNP 1972-1977 brook trout distribution map). Future management of this stream should include a rainbow trout removal program.

086 Dry Branch

Map Location: Luftee Knob Quadrangle (174-NW). This stream is a tributary to Camel Hump Creek. Its headwaters begin just northwest of Cosby Knob. It is located in Cocke County, Tennessee.

Ownership Pattern: The entire 1.4 km (0.9 mi) of stream is on National Park land.

Elevation:
Mouth - 829 m (2,720 ft)
Head - 1,207 m (3,960 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 26.1%

Barriers: None Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: No previous documentation of brook trout being present in Dry Branch was found other than that Holloway (1945) stated that a few native brook trout occurred in the headwaters of Cosby Creek (Dry Branch is a headwater tributary that enters Cosby Creek). Kelly et al. (1980) reported that both brook trout and rainbow trout were found in the stream in 1975. Brook trout were found from the mouth at 829 m (2,720 ft) elevation up to about 1,085 m (3,560 ft) elevation on the right fork tributary and the stream has about 0.2 km (0.1 mi) of sympatric brook/rainbow trout near the mouth and approximately 1.0 km (0.6 mi) allopatric brook trout water (GSMNP 1972-1977 brook trout distribution map). Future management of this stream should include a rainbow trout removal program.

087 Dry Fork

Map Location: Needy Mountain Quadrangle (173-NE), Paint Rock Quadrangle (182-NW), and Lemon Gap Quadrangle (182-NW). This stream is a tributary to Trail Fork Big Creek. Its headwaters begin on the northeast side of Round Mountain near Marrow Gap in Cocke County, Tennessee.

Ownership Pattern: Approximately 5.8 km (3.6 mi) of stream is on private land, and the remaining 2.6 km (1.6 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 378 m (1,240 ft)
Head - 1,073 m (3,520 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 8.3%

Barriers:
1. Man-made; near the Forest Service boundary line.

Water Quality: (Determined 2 June 1968 by TWRA stream survey):
pH - 7.5
Dissolved Oxygen - 9 ppm
Hardness - 34 ppm
M.O. Alkalinity - 34 ppm
Temperature - 15°C (59°F)

Sources of Pollution: Not Recorded

Other Species Present:
Rainbow trout (Salmo gairdneri
Dace (Rhinichthys spp.)

Stream Conditions: The portion of the stream that is in pools is estimated at about 45%. The stream bottom is composed primarily of gravel, rubble, and boulders.

Vegetative Conditions: The watershed has about 50% timber, 30% pasture, and 20% in cultivated land. The portion of the streambank on the Forest Service section of the stream is mostly timber. It is estimated that over 85% of the stream has shade or canopy.

Discussion: This stream was listed by the TWRA (1968b) stream survey report as having rainbow trout along with minnows (Cyprinid spp.) and suckers (Catostomid spp.) present. The Forest Service constructed a barrier in 1983 and rainbow trout removal was begun. However, only 3 rainbow trout and three (127.0 mm - 5.0 in) brook trout were found. The brook trout were possibly stocked by anglers. The stream appears to have good water quality and stocking of brook trout may prove successful (Strange 1983).

088 Middle Prong Gulf Creek

Map Location: Waterville Quadrangle (173-SE) and Lemon Gap Quadrangle (182-SW). This stream is a tributary to the Gulf Fork Big Creek. Its headwaters begin on the northwest side of Lamb Gulf in Cocke County, Tennessee.

Ownership Pattern: The entire 4.3 km (2.7 mi) of stream is on Champion Paper Company land.

Elevation:
Mouth - 840 m (2,755 ft)
Head - 1,158 m (3,800 ft)

Aspect: West

Stream Size:
Average Width - 1.2 m (4.0 ft)
Width Varies - 0.6 to 2.7 m (2.0 to 9.0 ft)
Average Pool Depth - 0.3 m (1.0 ft)
Average Riffle Depth - 10.2 cm (4.0 in)

Percent Grade: 7.3%

Barriers: None Recorded

Water Quality: (Determined 2 May 1968 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 34 ppm
Temperature - 12°C (53°F)

Sources of Pollution: None Recorded

Other Fish Species Present:
Rainbow trout (*Salmo gairdneri*)
Dace (*Rhinichthys* spp.)

Fish Collected: July 1978 by Whitworth and Strange
Brook Trout Average Length: 131.0 mm (5.2 in)
Brook Trout Average Weight: 23.3 g (0.8 oz)
Average K Brook Trout Greater Than 100 mm: 1.01
Number of Brook Trout Greater Than 100 mm: 5
Number of Brook Trout Less Than 100 mm: 0
Rainbow Trout Average Length: 167.0 mm (6.6 in)
Rainbow Trout Average Weight: 52.2 g (1.9 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.02
Number of Rainbow Trout Greater Than 100 mm: 10
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: This stream has a good pool-riffle ratio and cover for fish is good. Its bottom is composed predominantly of small to large rubble. Siltation in the stream is light.

Vegetative Conditions: The streambank has approximately 70 to 80% forest cover, and the understory is predominantly rhododendron (*Rhododendron* spp.).

Discussion: Tatum (1968) listed this stream as having brook trout. He stated that the population was very low at that time and concluded that this was due to erosion caused by forest fires and logging. The TWRA (1968b) stream survey report listed brook trout along with rainbow trout as the primary species present. Whitworth and Strange (1979) surveyed this stream and found that there seems to be a good, healthy brook trout population present. They documented approximately 0.5 km (0.3 mi) of brook trout water, starting at about 975 m (3,200 ft) elevation. It was estimated that the stream has 1.6 km (1.0 mi) of allopatric brook trout water, however, the extent of the population was not checked. Rainbow trout were present in the lower section of the stream and a sympatric brook/rainbow trout zone of about 0.2 km (0.1 mi) occurred around 975 m (3,200 ft) elevation. They recommended no special management at this time, however, it may be beneficial to remove the rainbow trout to protect the brook trout population, as no natural barriers were found on the stream.

Currently the whole watershed is being logged (Elsen, personal communication).

089 Brown Gap Creek

Map Location: Waterville Quadrangle (173-SE) and Lemon Gap Quadrangle (182-SW). This stream is a tributary to the Gulf Fork Big Creek. Its headwaters begin on the northwest side of Lamb Gulf in Cocke County, Tennessee.

Ownership Pattern: The entire 3.4 km (2.1 mi) of stream is on Champion Paper Company land.

Elevation:
Mouth - 850 m (2,790 ft)
Head - 1,195 m (3,920 ft)

Aspect: Northwest

Stream Size:
Average Width - 2.1 m (7.0 ft)
Width Varies - 0.9 to 4.6 m (3.0 to 15.0 ft)
Average Pool Depth - 0.5 m (1.5 ft)
Average Riffle Depth - 15.2 cm (6.0 in)

Percent Grade: 10.2%

Barriers: None Recorded

Water Quality: (Determined 2 May 1968 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 10 ppm
Hardness - 34 ppm
M.O. Alkalinity - 51 ppm
Temperature - 11°C (52°F)

(Determined in July 1978 at 899 m - 2,950 ft elevation):
Dissolved Oxygen - 11 ppm
Hardness - 17 ppm
Alkalinity - 17 ppm
Temperature - 17°C (62°F)
Siltation - very light

Sources of Pollution: None Recorded

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Dace (Rhinichthys spp.) - collected only near the mouth

Fish Collected: July 1978 by Whitworth and Strange
Brook Trout Average Length: 127.0 mm (5.0 in)
Number of Brook Trout Greater Than 100 mm: 11
Number of Brook Trout Less Than 100 mm: 2
Rainbow Trout Average Length: 168.0 mm (6.6 in)
Number of Rainbow Trout Greater Than 100 mm: 10
Number of Rainbow Trout Less Than 100 mm: 1

Stream Conditions: The stream is mostly small riffles, shallow pools, cascades, and not very many deep pools. Its bottom composition is mostly large gravel to boulders. The gradient is steep, but siltation is light.

Vegetative Conditions: The streambank has approximately 70 to 80% forest cover, and the understory is predominantly rhododendron (Rhododendron spp.). Rhododendron is very thick and tangled in the upper reaches of the stream.

Discussion: Tatum (1968) listed the stream as having brook trout. He stated that the population was very low at that time and concluded this was due to erosion caused by forest fires and logging. The TWRA (1968b) stream survey report listed brook trout along with rainbow trout as the primary species present. Whitworth and Strange (1979) surveyed this stream and generally concluded that it has a healthy population of brook trout present. They documented approximately 0.5 km (0.3 mi) of brook trout water, starting at about 927 m (3,040 ft) elevation. It was estimated that the stream has 2.3 km (1.4 mi) of allopatric brook trout waters; however, the

extent of the population was not checked. Rainbow trout were found from the mouth up to about 927 m (3,040 ft) elevation where a sympatric brook/rainbow trout zone of about 0.2 km (0.1 mi) occurred. They stated that no special management appears necessary at this time, as pool-riffle ratio and cover for fish appears to be satisfactory. However, it may be beneficial to remove the rainbow trout in order to protect the brook trout population, as no natural barriers exist in the stream.

Currently the whole watershed is being logged (Elsen, personal communication).

090 Little Paint Creek

Map Location: Hot Springs Quadrangle (182-NE). This stream is a tributary to Paint Creek. Its headwaters begin on the south side of Buzzard Roost Ridge near Deep Gap on Bald Mountain in Greene County, Tennessee.

Ownership Pattern: The entire 4.8 km (3.0 mi) of stream is on Forest Service land.

Elevation:
Mouth - 584 m (1,915 ft)
Head - 908 m (2,980 ft)

Aspect: West

Stream Size: Not Recorded

Percent Grade: 6.7%

Barriers: 1. Man-made; located in the lower stream section.

Sources of Pollution: Siltation from road and from road and trail crossings.

Other Fish Species Present:
Rainbow trout (*Salmo gairdneri*)
Brown trout (*Salmo trutta*)
Blacknose dace (*Rhinichthys atratulus*)

Fish Collected: October 1980 by Elsen
Number of Brook Trout Greater Than 100 mm: 11
Number of Brook Trout Less Than 100 mm: 0
Number of Rainbow Trout Greater Than 100 mm: 33

Number of Rainbow Trout Less Than 100 mm: 44
Number of Brown Trout Greater Than 100 mm: 1
Number of Brown Trout Less Than 100 mm: 2

Stream Conditions: The stream bottom is composed primarily of gravel, boulders, and bedrock. Most of the stream is low gradient and the stream cannot flush itself very well. Siltation is very heavy in areas where the water velocity is slow. Pools are generally small and cover for fish is somewhat lacking, especially in low water years. Five wing deflectors, two log dams, and one cover log were constructed by the Forest Service to help improve stream cover.

Vegetative Conditions: Not Recorded

Discussion: There is no record of this stream having brook trout and Elsen (1980) found only rainbow trout throughout the stream, with a few brown trout near the mouth. It is only mentioned here because of the Forest Service effort to establish brook trout. It was stocked with Owhi strain brook trout fingerlings in 1980.

A rock barrier was constructed in 1982 and 138 rainbow trout were removed from the stream and placed below the barrier. Another 183 rainbow trout were removed in 1983. They were found from the barrier into the headwaters for a distance of about 3.2 km (2.0 mi). Only 4 or 5 brook trout were recovered in 1983. It appears that more rainbow trout removal work is necessary on Little Paint Creek (Strange 1983).

091 Jennings Creek (Headwaters)

Map Location: Greystone Quadrangle (190-SW). This stream is a tributary to Water Fork which is a tributary to Camp Creek. Its headwaters begin near the top of Bald Mountain near Chestnutlog Gap. It is located in the Cherokee Wildlife Area in Greene County, Tennessee.

Ownership Pattern: The lower 3.7 km (2.3 mi) of stream is on private land, and the next 4.2 km (2.6 mi) is on Forest Service land. The remaining 1.3 km (0.8 mi) of headwater is on private land.

Elevation:
Mouth - 453 m (1,485 ft)
Lower Forest Service boundary - 555 m (1,820 ft)
Head - 1,274 m (4,180 ft)

Aspect: Northwest

Stream Size: (Determined in July 1979 at 555 m - 1,820 ft elevation):
Width - 5.5 m (18.0 ft)
Depth - 16.3 cm (6.5 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.28 (9.4 CFS)
Water Level Conditions - high

Percent Grade: 13.1% (Determined for headwaters only)

Barriers: No waterfalls, but a large cascades area near the stream junction at approximately 780 m (2,560 ft) elevation may be a barrier to fish movement. No fish were collected above this area.

Water Quality: (Determined 18 March 1970 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 10 ppm
Hardness - 34 ppm
M.O. Alkalinity - 34 ppm
Temperature - 1°C (34°F)

(Determined in July 1979):
pH - 6.4 at 555 m (1,820 ft) elevation
pH - 6.4 at 753 m (2,470 ft) elevation
Total Hardness - 4 ppm at 555 m (1,820 ft) elevation
Total Hardness - 6 ppm at 753 m (2,470 ft) elevation
Temperature - 16°C (60°F) at 555 m (1,820 ft) elevation
Siltation - moderate

Sources of Pollution: Some siltation from trails, especially in the lower portion where they are used as horse trails.

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)
Mottled sculpin (Cottus bairdi)

Fish Collected: July 1979 by Bivens
Rainbow Trout Average Length: 124.0 mm (4.9 in)
Number of Rainbow Trout Greater Than 100 mm: 30
Number of Rainbow Trout Less Than mm: 7

Stream Conditions: This stream has a satisfactory pool-riffle ratio of about 40%. The lower section of the stream is mostly wide riffle areas that are usually pretty deep with many large

rocks and boulders which provide cover for fish. The upper stream section has a better mixture of pools and riffles. Riffle areas make up approximately 62% of the stream, while about 31% is made up of pools, only 1% in flats, and the remaining 6% is in cascades or bedrock areas. The overall stream gradient is moderate. The stream is composed of fine gravel and small rubble with many larger rocks and boulders. There are very few areas with undercut banks, and siltation appears moderate.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of maple (Acer spp.), birch (Betula spp.), yellow poplar (Liriodendron tulipifera), hemlock (Tsuga canadensis), rhododendron (Rhododendron spp.), dog hobble (Leucothoe editorum), and dogwood (Cornus florida). The stream has overhanging rhododendron in most areas and the upper portion is cluttered with debris and overgrown with rhododendron.

Discussion: Tatum (1968) found brook trout in the headwaters of this stream, but stated that the population was very low at that time. He concluded that this was due to erosion caused by forest fires and logging. The TWRA (1970a) stream survey report listed rainbow trout as the primary species present. Bivens (1979) found only rainbow trout present in the stream. An allopatric, stream reproducing rainbow trout population exists from the lower Forest Service boundary to approximately 2.6 km (1.6 mi) into the headwaters

This stream probably has no future potential for brook trout management because of the firmly established rainbow trout population. It has no natural barriers except in the headwaters which have limited access and stocking native brook trout in above this may not be practical.

092 Round Knob Branch (Little Jennings Creek)

Map Location: Graystone Quadrangle (190-SW). This stream is a tributary to Jennings Creek. Its headwaters begin on the north side of Round Knob in Greene County, Tennessee.

Ownership Pattern: The entire 3.2 km (2.0 mi) of stream is on Forest Service land.

Elevation:
At the mouth - 573 m (1,880 ft)
Head - 975 m (3,200 ft)

Aspect: North

Stream Size: (Determined in August 1979 at 573 m - 1,880 ft elevation):
Width - 2.3 m (7.6 ft)
Depth - 10.4 cm (4.1 in)
Velocity - 0.2 meter per second (0.8 foot per second)
Cubic Meters Per Second - 0.05 (1.7 CFS)
Water Level Conditions - normal

Percent Grade: 12.5%

Barriers: 1. Man-made barrier at the mouth: 573 m (1,880 ft) elevation.
2. Falls; approximately 1.5 m (5.0 ft) vertical height; at about 658 m - 2,160 ft elevation.
3. Falls; approximately 1.5 m (5.0 ft) vertical height; at about 707 m - 2,230 ft elevation.

Water Quality: (Determined 18 March 1970 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 9°C (49°F)

(Determined in August 1979 at 573 m - 1,880 ft elevation):
pH - 6.8
Total Hardness - 5 ppm
Temperature - 17°C (62°F)
Siltation - medium

Sources of Pollution: Siltation from trail crossings.

Other Species Present:
Rainbow trout (*Salmo gairdneri*)
Dace (*Rhinichthys* spp.)

Fish Collected: August 1979 by Bivens
Brook Trout Average Length: 118.5 mm (4.7 in)
Number of Brook Trout Greater Than 100 mm: 2
Number of Brook Trout Less Than 100 mm: 0
Rainbow Trout Average Length: 135.0 mm (5.3 in)
Number of Rainbow Trout Greater Than 100 mm: 9
Number of Rainbow Trout Less Than 100 mm: 5

April 1982 by Elsen
Number of Brook Trout Greater Than 100 mm: 1
Number of Brook Trout Less Than 100 mm: 0
Number of Rainbow Trout Greater Than 100 mm: 41
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: There is an overall mixture of pools and riffles of about 35%. Riffle areas make up approximately 55% of the stream while about 24% is made up of pools, 3% in flats, and the remaining 18% is in cascades or bedrock areas. The stream is mostly riffles that are narrow and shallow, with some good pools, and lots of areas with cascades and bedrock. The stream bottom is composed of very fine gravel to small rubble with larger rocks and boulders. There are a few areas with undercut banks. Lots of organic debris is present and siltation is medium. The overall gradient is moderate.

Vegetative Conditions: The stream has approximately 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), birch (Betula spp.), maple (Acer spp.), tulip poplar (Liriodendron tulipifera), rhododendron (Rhododendron spp.), and dog hobble (Leucothoe editorum). The streambank has lots of overhanging rhododendron.

Discussion: Tatum (1968) listed this stream as having brook trout but he stated that the population was very low at that time. He concluded that this was due to erosion caused by forest fires and logging. The TWRA (1970a) stream survey report listed minnows (Cyprinid spp.) as the primary species present. Between 1978 and 1980 the Forest Service stocked Round Knob Branch with Owhi strain eyed-eggs and fingerling brook trout. A 1979 Forest Service survey (Bivens 1979) found wild rainbow trout throughout the stream and only two Owhi strain brook trout were recovered.

Elsen (1982) surveyed the stream again and found only wild rainbow trout present. Later that year, rainbow trout removal began and 90 rainbow trout were removed and transported to Jennings Creek. Another 300 Owhi strain fingerlings brook trout were then stocked in the stream.

In 1983 a barrier was built at the mouth and 270 rainbow trout were removed over two separate occasions. Only 11 Owhi strain brook trout were collected and none were y-o-y fish. There was a significant decline in the number of rainbow trout removed on the second 1983 trip (Strange 1983). Sixty wild brook trout from Little Stony Creek in Carter County were transported to Round Knob Branch in 1983 and stocked in the stream.

093 Dry Creek

Map Location: Davy Crockett Lake Quadrangle (181-SE) and Greystone Quadrangle (190-SW). This stream is a tributary to Camp Creek. Its headwaters begin on the north side of Bald Mountain near Little Firescald Knob in Greene County, Tennessee.

Ownership Pattern: Approximately 6.1 km (3.8 mi) of stream is under private ownership. Most of the lower section is private land along with a small section of the upper reaches that are in the Camp Creek Bald Development. About 4.5 km (2.8 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 415 m (1,360 ft)
Head - 1,256 m (4,120 ft)

Aspect: Northwest

Stream Size: (Determined in November 1982 at 591 m - 1,940 ft elevation):
Width - 2.4 m (8.0 ft)
Depth - 25.4 cm (10.0 in)
Velocity - 0.5 meter per second (1.8 foot per second)
Cubic Meters Per Second - 0.32 (10.6 CFS)
Water Level Conditions - very high

Percent Grade: 7.9%

Barriers:
1. Falls; approximately 1.8 m (6.0 ft) vertical height; at about 658 m (2,160 ft) elevation.
2. Falls; approximately 1.5 m (5.0 ft) vertical height; at about 600 m (1,970 ft) elevation.
3. Falls; approximately 1.5 m (5.0 ft) vertical height; at about 605 m (1,980 ft) elevation.

Water Quality: (Determined 18 March 1970 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 10 ppm
Temperature - 9°C (49°F)

(Determined 29 November 1982 at 604 m - 1,980 ft elevation):
pH - 5.4
Conductivity - 20 umhos/cm
Siltation - light

Sources of Pollution: Possibility of some contamination from Camp Creek Bald Development. Changes in pH from 4.9 to 5.4 and conductivity from 20 to 47 umhos/cm were recorded in November and December 1982.

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: November 1982 by Elsen
Number of Brook Trout Greater Than 100 mm: 1
Number of Brook Trout Less Than 100 mm: 0
Number of Rainbow Trout Greater Than 100 mm: 13
Number of Rainbow Trout Less Than 100 mm: 8

Stream Conditions: On Forest Service land there is an overall mixture of pools and riffles of about 85%. Riffle areas make up approximately 40% of the stream while about 45% is made up of pools, no flats, and the remaining 15% is in cascades or bedrock areas. The stream is composed of gravel, small and large rubble, large boulders, and bedrock. Pool development is very good and there are several small falls. Siltation is light.

Vegetative Conditions: On Forest Service land the streambank has approximately 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipfera) hemlock (Tsuga canadensis), birch (Betula spp.), and rhododendron (Rhododendron spp.).

Discussion: For now, this stream has a wild population of rainbow trout. It is only mentioned here because the Forest Service stocked it with Owhi strain brook trout eyed-eggs and fingerlings between 1978 and 1980. However, only 1 brook trout was recovered in the recent Forest Service survey (Elsen 1982).

094 Davis Creek

Map Location: Graystone Quadrangle (199-SW). This stream is a tributary to Dry Creek. Its headwaters begin on the northwest face of Bald Mountain in Greene County, Tennessee.

Ownership Pattern: The lower 2.9 km (1.8 mi) of stream is on private land, and the upper 3.5 km (2.2 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 471 m (1,545 ft)
Head - 1,244 m (4,080 ft)

Aspect: Northwest

Stream Size: (Determined in November 1982 at 585 m - 1,920 ft elevation):
Width - 2.1 m (7.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.10 (3.2 CFS)
Water Level Conditions - moderately low

Percent Grade: 12%

Barriers:
1. Man-made barrier at about 644 m (2,180 ft) elevation.
2. Falls; approximately 1.5 m (5.0 ft) vertical height; at about 975 m (3,200 ft) elevation.

Water Quality: (Determined 18 March 1970 by TWRA stream survey:
pH - 7.0
Dissolved Oxygen - 8 ppm
Hardness - 34 ppm
M.O. Alkalinity - 17 ppm
Temperature - 10°C (50°F)

Sources of Pollution: None

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Stream Conditions: On Forest Service land there is an overall mixture of pools and riffles of about 80%. Riffle areas make up approximately 50% of the stream, while about 35% is made up of pools, no flats, and the remaining 15% is in cascades or bedrock areas. The stream bottom is composed of gravel, small and large rubble, boulders, and bedrock. There are many good pools that provide cover for fish. Siltation is slight.

Vegetative Conditions: On Forest Service land the streambank has approximately 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), hemlock (Tsuga canadensis), birch (Betula spp.), oak (Quercus spp.), and rhododendron (Rhododendron spp.).

Discussion: For now, this stream has a wild population of rainbow trout. It is only mentioned here because of Forest Service efforts to establish brook trout. It was stocked with Owhi trout eyed-eggs and fingerlings between 1978 and 1980. A barrier was constructed at 664 m (2,180 ft) elevation in 1982 and a rainbow trout removal program begun.

In 1982, 514 rainbow trout were removed and carried below the barrier. Another 480 were removed over two occasions in 1983. Only 3 Owhi strain brook trout were recovered in 1983 and there appears to have been a substantial reduction in rainbow trout since the first 1983 removal trip (Strange 1983).

Davis Creek has excellent water quality and pool development that provides good to excellent cover. Productivity is very good with better than 300 trout per stream mile. The wild rainbow trout are very colorful with white edges on the anal and pelvic fins that is distinctive for this population. Establishing a brook trout population above the barrier while maintaining the wild rainbow trout population below the barrier could develop into a popular wild trout fishery (Elsen 1982).

095 West Fork

Map Location: Greystone Quadrangle (190-SW). This stream is a tributary to Dry Creek. Its headwaters begin on the north side of Little Bald Mountain near Low Gap in Greene County, Tennessee.

Ownership Pattern: The entire 3.9 km (2.4 mi) of stream is on Forest Service land.

Elevation:
Mouth - 608 m (1,995 ft)
Head - 1,109 m (3,640 ft)

Aspect: North

Stream Size: (Determined in November 1982 at 608 m - 1,995 ft elevation):
Width - 2.7 m (9.0 ft)
Depth - 15.2 cm (6.0 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.16 (5.4 CFS)
Water Level Conditions - moderately high

Percent Grade: 13%

Barriers:
1. Several falls; beginning at about 695 m (2,280 ft) elevation.
2. Falls; at about 762 m (2,500 ft) elevation.

Water Quality: (Determined 23 November 1982 at 608 m - 1,995 ft elevation):
pH - 6.2
Conductivity - 14 umhos/cm
Siltation - slight

Sources of Pollution: None

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)

Fish Collected: November 1982 by Elsen
Number of Brook Trout Greater Than 100 mm: 6
Number of Brook Trout Less Than 100 mm: 0
Number of Rainbow Trout Greater Than 100 mm: 14
Number of Rainbow Trout Less Than 100 mm: 12

Stream Conditions: There is an overall mixture of pools and riffles of about 75%. Riffle areas make up approximately 35% of the stream while about 35% is made up of pools, no flats, and the remaining 30% is in cascades or bedrock areas. The stream bottom is composed of gravel, large rubble, bedrock, and large boulders. Siltation is slight.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), yellow poplar (Liriodendron tulipfera), hemlock (Tsuga canadensis, and rhododendron (Rhododendron spp.).

Discussion: For now, this stream has a wild population of rainbow trout. It is only mentioned here because the Forest Service stocked it with Owhi strain brook trout. However, only 6 brook trout were recovered in the recent Forest Service survey (Elsen 1982).

096 Phillips Hollow

Map Location: Greystone Quadrangle (190-SW). This stream is a tributary to Dry Creek. Its headwaters begin on Bald Mountain just northwest of Big Firescald Knob in Greene County, Tennessee.

Ownership Pattern: The entire 2.9 km (1.8 mi) of stream is on Forest Service land.

Aspect: Northwest

Stream Size: (Determined in November 1982 at 648 m - 2,125 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 14.0 cm (5.5 in)
Velocity - 0.3 meter per second (1.1 foot per second)
Cubic Meters Per Second - 0.08 (2.6 CFS)
Water Level Conditions - moderately low

Percent Grade: 21.6%

Barriers: 1. Falls; approximately 1.8 m (6.0 ft) vertical height; at about 683 m (2,240 ft) elevation.

Water Quality: (Determined 26 November 1982 at 648 m- 2,125 ft elevation):
pH - 4.7 (needs monitoring)
Conductivity - 16 umhos/cm
Siltation - fairly light

Sources of Pollution: pH reading was low, it may reflect rainfall on the previous day. The stream needs monitoring.

Other Fish Species Presents: Rainbow trout (Salmo gairdneri)

Fish Collected: November 1982 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 21
Number of Rainbow Trout Less Than 100 mm: 8

Stream Conditions: There is an overall mixture of pools and riffles of about 80%. Riffle areas make up approximately 45% of the stream while about 35% is made up of pools, no flats, and the remaining 20% is in cascades or bedrock areas. The stream bottom is composed of gravel, large and small rubble, boulders, and bedrock. It has good pool development, and siltation is fairly light.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), birch (Betula spp.), and rhododendron (Rhododendron spp.). Rhododendron along the streambank is thick.

Discussion: For now, this stream has a wild population of rainbow trout. It is only mentioned here because the Forest Service stocked it with Owhi strain brook trout eyed-eggs and fingerlings between 1978 and 1980. However, no brook trout were recovered in the recent Forest Service survey (Elsen 1982).

097 Squibb Creek (Left Fork Horse Creek)

Map Location: Greystone Quadrangle (190-SW) and Flag Pond Quadrangle (190-SE). This stream is a tributary to Horse Creek. Its headwaters begin northwest of Rich Mountain just south of Middle Spring Ridge in Greene County, Tennessee.

Ownership Pattern: The lower 3.1 km (1.9 mi) of stream is on Forest Service land, and the upper 1.4 km (0.9 mi) of headwater is on private land.

Elevation:
At the mouth - 556 m (1,825 ft)
Head - 1,274 m (4,180 ft)

Aspect: Northwest

Stream Size: (Determined in July 1979 at 556 m - 1,825 ft elevation):
Width - 2.4 m (8.0 ft)
Depth - 12.4 cm (4.9 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.09 (3.1 CFS)
Water Level Conditions - high

Percent Grade: 15.9%

Barriers:
1. Man-made; rock, masonry, and hemlock log; approximately 1.7 m (5.5 ft) vertical height; at about 585 m (1,920 ft) elevation.
2. Falls; approximately 10.0 m (32.0 ft) vertical height; at about 829 m (2,720 ft) elevation.

Water Quality: (Determined 18 March 1970 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 10 ppm
Hardness - 34 ppm
M.O. Alkalinity - 4 ppm
Temperature - 9°C (49°F)

(Determined in July 1979 at 556 m - 1,825 ft elevation):
pH - 6.8
Total Hardness - 5 ppm
Temperature - 15°C (59°F)
Siltation - medium

Sources of Pollution: Siltation from trail crossings.

Other Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)

Fish Collected: July 1978 by Bivens
Brook Trout Average Length: 113.4 mm (4.5 in)
Number of Brook Trout Greater Than 100 mm: 16
Number of Brook Trout Less Than 100 mm: 1
Rainbow Trout Average Length: 127.0 mm (5.0 in)
Number of Rainbow Trout Greater Than 100 mm: 18
Number of Rainbow Trout Less Than 100 mm: 5

Stream Conditions: There is an overall mixture of pools and riffles of about 45%. Riffle areas make up approximately 60% of the streams while about 37% is made up of pools, no flats, and the remaining 3% is in cascades or bedrock areas. The lower section of the stream is mostly riffle areas and the mixture of pools and riffles is not very good. There are not too many areas with cascades or bedrock and the upper section is mostly riffles also. The stream bottom is composed of fine gravel to small rubble with larger rocks and many boulders. There are no undercut banks, but many of the large boulders provide cover for fish. Overall the average gradient is moderate. Organic debris is present in pools and siltation is evident, but not too serious.

Vegetative Conditions: The stream has approximately 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), tulip poplar (Liriodendron tulipfera), maple (Acer spp.), and rhododendron (Rhododendron spp.).

Discussion: Tatum (1968) listed this stream as having brook trout, he did not indicate that the population was low at that time. However, the TWRA (1970a) stream survey report listed rainbow trout as the primary species present. Between 1978 and 1980 the Forest Service stocked Squibb Creek with Owhi strain eyed-eggs and fingerling brook trout. A 1979 Forest Service survey (Bivens 1979) found wild rainbow trout throughout the stream along with 17 Owhi strain brook trout in the lower section.

In 1980, the Forest Service constructed a 1.4 m (4.5 ft) rock and masonry barrier near the mouth and began rainbow trout removal. Five-hundred thirty rainbow trout were electroshocked and transported below the barrier that year. Most of these were y-o-y fish. Also, approximately 300 more Owhi strain brook trout were stocked at that time, some were transported in above the falls at 829 m (2,720 ft) elevation.

The barrier was built up another 0.3 m (1.0 ft) to create a 1.7 m (5.5 ft) vertical drop in 1982, and 55 more wild rain-

bow trout were removed. Approximately 400 more Owhi strain 12.7 cm (5.0 in) fingerling brook trout were stocked that same year.

In May and June of 1983, another 216 rainbow trout were removed, and Owhi brook trout were only found in the upper portion of the stream. Later that year another 290 rainbow trout were removed from the stream, and less than a dozen Owhi brook trout were recovered. However, two of the brook trout were y-o-y and it appears there may be some limited reproduction of the Owhi strain brook trout in this stream (Strange 1983). It also appears that a lot of work still remains to be done in removing the rainbow trout.

098 Turkeypen Cove

Map Location: Greystone Quadrangle (190-SW). This stream is a tributary to Squibb Creek which is a tributary to Horse Creek. Its headwaters begin on the northwest side of Middle Spring Ridge in Greene County, Tennessee.

Ownership Pattern: The entire 1.6 km (1.0 mi) of stream is on Forest Service land.

Elevation:
Mouth - 604 m (1,980 ft)
Head - 866 m (2,840 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 16.3%

Barriers: Not Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present:
Rainbow trout (*Salmo gairdneri*)
Blacknose dace (*Rhinichthys atratulus*)

Fish Collected: July 1979 by Bivens
Number of Brook Trout Greater Than 100 mm: 2
Number of Brook Trout Less Than 100 mm: 0
Number of Rainbow Trout Greater Than 100 mm: 0
Number of Rainbow Trout Less Than 100 mm: 1

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: This stream is small, not much over 1.2 m (4.0 ft) at the mouth. It was checked by Bivens (1979) at one point only, and is mentioned here only because two of the Owhi strain brook trout from Squibb Creek were found present in the stream.

099 Sarvis Cove (Right Fork Horse Creek)

Map Location: Greystone Quadrangle (190-SW). This stream is a tributary to Horse Creek. Its headwaters begin on Bald Mountain near Middle Ridge in Greene County, Tennessee.

Ownership Pattern: There is about 0.2 km (0.1 mi) of privately owned land near the mouth. The remaining 3.7 km (2.3 mi) of stream is on Forest Service land.

Elevation:
Mouth - 622 m (2,040 ft)
Head - 1,250 m (4,100 ft)

Aspect: Northwest

Stream Size: (Determined in May 1982 at 622 m - 2,040 ft elevation):
Width - 2.1 m (7.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.07 (2.4 CFS)
Water Level Conditions - low

Percent Grade: 15.6%

Barriers: 1. Two marginal falls; location not recorded.

Water Quality: (Determined 2 April 1982 near the mouth):
pH - 6.3
Siltation - light

Sources of Pollution: A little siltation from road/trail.

Other Fish Species Present: Rainbow trout (*Salmo gairdneri*)

Fish Collected: April 1982 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 48
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: There is an overall mixture of pools and riffles of about 40%. Riffle areas make up approximately 35% of the stream, while about 20% is made up of pools, 10% in flats, and the remaining 35% is in cascades or bedrock areas. The stream bottom is composed of gravel, rubble, and boulders with stretches that are mostly shallow riffle or bedrock areas. There are some good pools in the lower end and siltation is light.

Vegetative Conditions: The streambank has approximatlely 99% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), birch (Betula spp.), and rhododendron (Rhododendron spp.). About 1% of the stream has a rhododendron understory but no overstory.

Discussion: For now, this stream has a wild rainbow trout population. It is only mentioned here because the Forest Service stocked it with Owhi strain brook trout eyed-eggs and fingerlings between 1978 and 1980. However, no brook trout were recovered in the recent Forest Service survey (Elsen 1982).

100 Cassi Creek

Map Location: Telford Quadrangle (190-NE) and Flag Pond Quadrangle (190-SE). This stream is a tributary to the Nolichucky River. Its headwaters begin with the confluence of Middle Fork and West Fork Cassi Creek. It is located in both Washington County and Greene County, Tennessee.

Ownership Pattern: The lower 5.6 km (3.5 mi) of stream is on private land, and the remaining 1.4 km (0.9 mi) of upper stream is on Forest Service land.

Elevation:
Mouth - 429 m (1,407 ft)
Head - 604 m (1,980 ft)

Aspect: Northeast

Stream Size: (Determined 17 May 1984 at 558 m - 1,830 ft elevation):
Width - 4.8 m (15.8 ft)
Depth - 13.5 cm (5.3 in)

Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.2 (6.7 CFS)
Water Level Conditions - normal

Percent Grade: 2.5%

Barriers: 1. The lower stream flows into the substrate about 1.6 km (1.0 mi) from its confluence with the Nolichucky River.

Water Quality: (Determined 18 March 1970 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 10 ppm
Temperature - 9°C (49°F)

(Determined 17 May 1984 at 558 m - 1,830 ft elevation):
pH - 6.5
Total Hardness - 6 ppm
Temperature 11°C (52°F)
Siltation - medium to light

Sources of Pollution: Not Recorded

Other Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)
Central stoneroller (Campostoma anomalum)
Stoneflies (Plecoptera)
Mayflies (Ephemeroptera)
Crayfish
Salamanders

Fish Collected: 17 May 1984 by Bivens
Rainbow Trout Average Length: 153.2 mm (6.0 in)
Rainbow Trout Average Weight: 41.6 g (1.5 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.16
Number of Rainbow Trout Greater Than 100 mm: 19
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: The upper stream is mostly deep, wide riffles with several good pools and cover for fish is good. The stream bottom is composed of sand, rubble, rocks, and boulders.

Vegetative Conditions: The local watershed has about 70% timber, 20% pasture, and 10% cultivation. The upper stream has 100% overstory and understory vegetation made up primarily of

hemlock (Tsuga canadensis), maples (Acer spp.), yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), and rhododendron (Rhododendron spp.).

Discussion: The TWRA (1968c) stream survey report listed both brook trout and rainbow trout as the primary species present in Cassi Creek. However, the TWRA (1970a) stream survey report listed only rainbow trout present in the stream. Bivens (1979, 1984) found only rainbow trout throughout the stream on Forest Service land. Good stream conditions exist and the stream supports a healthy rainbow trout population. This stream has no potential management for brook trout due to the firmly established rainbow trout population.

101 East Fork

Map Location: Flag Pond Quadrangle (190-SE). This stream is a tributary to Cassi Creek which is a tributary to the Nolichucky River. Its headwaters begin on the north side of Rich Mountain and it is located in the Cherokee Wildlife Area in Greene County, Tennessee.

Ownership Pattern: The lower 3.1 km (1.9 mi) of stream is on Forest Service land, and the remaining 0.3 km (0.2 mi) of extreme headwater is on private land.

Elevation:
Mouth - 570 m (1,870 ft)
Head - 1,122 m (3,680 ft)

Aspect: Northwest

Stream Size: (Determined 17 May 1984 at the mouth, at 570 m - 1,870 ft elevation):
Width - 4.4 m (14.3 ft)
Depth - 17.5 cm (6.9 in)
Velocity - 0.3 meter per second (0.9 foot per second)
Cubic Meters Per Second - 0.18 (5.9 CFS)

(Determined 17 May 1984 at 732 m - 2,400 ft elevation):
Width - 1.2 m (4.0 ft)
Water Level Conditions - normal

Percent Grade: 16.3%

Barriers: 1. Falls; approximately 1.2 m (4.0 ft) vertical height; at about 707 m (2,320 ft) elevation.

Water Quality: (Determined 18 March 1970 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 10 ppm
Temperature - 9°C (49°F)

(Determined 17 May 1984 at 570 m - 1,870 ft elevation):
pH - 7.3
Total Hardness - 6 ppm
Temperature - 8°C (47°F)
Siltation - light

Sources of Pollution: Some siltation from old jeep road.

Other Species Present:
Rainbow trout (Salmo gairdneri)
Central stoneroller (Campostoma anomalum)
Blacknose dace (Rhinichthys atratulus)
Mayflies (Ephemeroptera)
Stoneflies (Plecoptera)
Crayfish
Salamanders

Fish Collected: 17 May 1984 by Bivens
Rainbow Trout Average Length: 158.1 mm (6.2 in)
Rainbow Trout Average Weight: 52.9 g (1.9 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.34
Number of Rainbow Trout Greater Than 100 mm: 53
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: The stream has a pool-riffle ratio of about 50%. Riffle areas make up approximately 54% of the stream, while about 19% is made up of pools, 3% in flats, and the remaining 24% is in cascades or bedrock areas. Stream gradient is moderate in the lower portion but the upper stream becomes steeper. The stream has good cover for fish. It has many riffle areas with good pools. Lots of bedrock areas also occur. The stream bottom is composed of sand, gravel, large and small rubble, rocks, and many boulders. Overall, it has light siltation.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), red maple (Acer rubrum), yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), yellow buckeye (Aesculus octandra), rhododendron (Rhododnedron spp.), and wild hydrangea (Hydrangea arborescens). Most of the stream is fairly open, but the upper reaches have more

rhododendron.

Discussion: The TWRA (1970a) stream survey report listed both brook trout and rainbow trout as the primary fish species in East Fork. However, Bivens (1984) found only rainbow trout present. An allopatric rainbow trout population exists up to about 725 m (2,380 ft) elevation into the headwaters. Good stream conditions exist and the stream supports an excellent reproducing rainbow trout population. The main stream probably has no future potential for brook trout management due to the firmly established rainbow trout population. However, one tributary stream, located at about 613 m (2,010 ft) elevation has a cascades barrier at the mouth and no trout were collected above it. This tributary may be a good stream to relocate some native brook trout in. Close access to this tributary by vehicle may be possible.

102 Middle Fork

Map Location: Flag Pond Quadrangle (190-SE). This stream is a tributary to Cassi Creek which is a tributary to the Nolichucky River. It lies on the north side of Rich Mountain and is located in the Cherokee Wildlife Area in Greene County, Tennessee.

Ownership Pattern: The lower 2.3 km (1.4 mi) of stream is on Forest Service land, and the remaining 1.0 km (0.6 mi) of headwater is on private land.

Elevation
Mouth - 604 m (1,980 ft)
Head - 1,158 m (3,800 ft)

Aspect: Northwest

Stream Size: (Determined in July 1979 at 604 m - 1,980 ft elevation):
Width - 2.3 m (7.5 ft)
Depth - 9.5 cm (3.8 in)
Velocity - 0.2 meter per second (0.8 foot per second)
Cubic Meters Per Second - 0.05 (1.5 CFS)
Water Level Conditions - normal

Percent Grade: 17.2%

Barriers: None

Water Quality: (Determined in July 1979 at 604 m - 1,980 ft elevation):

pH - 6.7
Total Hardness - 7 ppm
Temperature - 17°C (62°F)
Siltation - moderate to light

Sources of Pollution: Some siltation from an old road that is now used as a trail.

Other Fish Species Present:

Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)

Fish Collected: July 1979 by Bivens

Rainbow Trout Average Length: 113.8 mm (4.5 in)
Number of Rainbow Trout Greater Than 100 mm: 17
Number of Rainbow Trout Less Than 100 mm: 13

Stream Conditions: This stream has an overall good mixture of pools and riffles. The satisfactory pool-riffle ratio is about 60%. Riffle areas make up approximately 53% of the stream, while about 30% is made up of pools, only 1% in flats, and the remaining 16% is in cascades or bedrock areas. The overall stream gradient is moderate. The stream bottom is composed of fine gravel to small rubble with larger rocks and boulders. There is lots of cover for fish. Siltation appears moderate to light and there is some organic debris in pools.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of maple (Acer spp.), birch (Betula spp.), hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), rhododendron (Rhododendron spp.), witch hazel (Hamamelis virginiana), and American elder (Sambucus canadensis).

Discussion: Tatum (1968) listed this stream as having brook trout. Bivens (1979) found no brook trout present. An allopatric, naturally reproducing population of rainbow trout now exists from the mouth to about 2.4 km (1.5 mi) above the mouth.

This stream is listed as probably having no future potential for brook trout management. Stream conditions are good and siltation is not a problem, however, there are no barriers to upstream movement of rainbow trout and the population is well established.

103 West Fork Cassi Creek

Map Location: Greystone Quadrangle (190-SW) and Flag Pond Quadrangle (190-SE). This stream is a tributary to Cassi Creek which is a tributary to the Nolichucky River. It lies on the north side of Rich Mountain just east of Middle Spring Ridge. It is located in the Cherokee Wildlife Area in Greene County, Tennessee.

Ownership Pattern: The lower 2.1 km (1.3 mi) of stream is on Forest Service land, and the remaining 0.5 km (0.3 mi) of headwater is on private land.

Elevation:
Mouth - 604 m (1,980 ft)
Head - 1,097 m (3,600 ft)

Aspect: North

Stream Size: (Determined in July 1979 at 610 m - 2,000 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 21.8 cm (8.7 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.11 (3.5 CFS)
Water Level Conditions - high

Percent Grade: 19.2%

Barriers: None

Water Quality: (Determined 18 March 1970 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 10 ppm
Temperature - 9°C (49°F)

(Determined in July 1979 at 610 m - 2,000 ft elevation):
pH - 6.8
Total Hardness - 6 ppm
Temperature - 15°C (59°F)
Siltation - light

Sources of Pollution: Some slight siltation from old trail near the stream.

Other Fish Species Present: Rainbow trout (*Salmo gairdneri*)

Fish Collected: July 1979 by Bivens
Only two rainbow trout were collected, one was 216.0 mm (8.5 in) and the other was 127.0 mm (5.0 in). Saw one rainbow trout escape.

Stream Conditions: This stream has a satisfactory pool-riffle ratio of about 40%. It is mostly riffle areas and the mixture of pools and riffles is not very good. Riffle areas make up approximately 62% of the stream, while about 26% is made up of pools, no flats, and the remaining 12% is in cascades or bedrock areas. The lower stream gradient is moderate, but the upper portion becomes steep. The stream bottom is composed of fine gravel to rubble with larger rocks and many large boulders that help to provide cover for fish. Not many undercut or overhanging banks. Some siltation is evident, but it is fairly light.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of maple (Acer spp.), birch (Betula spp.), hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), rhododendron (Rhododendron spp.), and dog hobble (Leucothoe editorum).

Discussion: Tatum (1968) found brook trout in this stream. But, the TWRA (1970a) stream survey listed only rainbow trout as the primary species present. Bivens (1979) found no brook trout and only two rainbow trout were collected from one section near the mouth. No other fish species were present either.

This stream may have some future potential for brook trout management. Stream conditions appear good and no other trout population exists there yet. Apparently though, rainbow trout are on an upstream movement from Cassi Creek and some stream improvements in the form of fish barriers would be necessary if the stream is stocked with native brook trout. No natural barriers exist on the stream. Access to the lower portion is fairly good and presents no problem, but there is no access to the upper portion of the stream, and stocking would prove difficult.

104 Painter Creek (Headwaters)

Map Location: Telford Quadrangle (190-NE) and Flag Pond Quadrangle (190-SE). This stream is a tributary to the Nolichucky River. Its headwaters begin on the north face of Rich Mountain northwest of Sampson Mountain. It is located in the Cherokee Wildlife Area in both Greene County, and Washington County, Tennessee.

Ownership Pattern: The lower 4.7 km (2.9 mi) of stream is on private land, and the remaining 4.5 km (2.8 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 429 m (1,408 ft)
Lower Forest Service boundary - 543 m (1,780 ft)
Head - 1,085 m (3,560 ft)

Aspect: North

Stream Size: (Determined in August 1979 at 567 m - 1,860 ft elevation):
Width - 2.4 m (8.0 ft)
Depth - 10.2 cm (4.0 in)
Velocity - 0.2 meter per second (0.8 foot per second)
Cubic Meters Per Second - 0.05 (1.6 CFS)
Water Level Conditions - normal

Percent Grade: 12.0% (Determined for headwaters only)

Barriers:
1. Falls; 4.6 m (15.0 ft) vertical height; at about 707 m (2,320 ft) elevation.
2. Long cascades; about 45.7 m (150.0 ft) vertical height; starts at about 768 m (2,520 ft) elevation.

Water Quality: (Determined in August 1979 at 567 m - 1,860 ft elevation):
pH - 7.2
Total Hardness - 6 ppm
Temperature - 18°C (64°F)
Siltation - moderate

Sources of Pollution: Siltation from steep surrounding areas and from trail crossings.

Other Fish Species Present:
Rainbow trout (*Salmo gairdneri*)
Blacknose dace (*Rhinichthys atratulus*)
Central stoneroller (*Campostoma anomalum*)
Saffron shiner (*Notropis rubricroceus*)

Fish Collected: August 1979 by Bivens
Rainbow Trout Average Length: 139.7 mm (5.5 in)
Number of Rainbow Trout Greater Than 100 mm: 14
Number of Rainbow Trout Less Than 100 mm: 12

Stream Conditions: This stream has a fairly good mixture of pools and riffles, especially in the lower section. The overall satisfactory pool-riffle ratio is about 50%. Riffle areas make up approximately 53% of the stream, while about 24% is made up of pools, 12% in flats, and the remaining 11% is in cascades or bedrock area. The overall stream gradient is fairly moderate with areas around the falls being very steep. The stream bottom is composed of fine gravel with small rubble to larger rubble and many large rocks and boulders. Cover for fish seems adequate. Siltation appears light in the lower areas and heavier in the upper part of the stream. Organic debris is present in pools and flats.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), maple (Acer spp.), rhododendron (Rhododendron spp.), and dogwood (Cornus florida). The stream is pretty much open below the falls, but above, it becomes snarled and tangled with rhododendron and debris.

Discussion: Tatum (1968) found brook trout in the headwaters, but stated that the population was very low at that time. He concluded that this was due to erosion caused by forest fires and logging. Bivens (1979) found no brook trout, and rainbow trout were present only in the lower section of the stream. An allopatric, stream reproducing rainbow trout population exists from the lower Forest Service boundary to the first falls just above South Fork.

This stream probably has no future potential for brook trout management due to the firmly established rainbow trout population. However, the stream has two barriers above which no trout species now exist and subsequent stocking of native brook trout above these barriers may prove successful. One problem with stocking the upper section of the stream though, is that access is limited and therefore stocking is probably not practical.

105 North Fork Sill Branch

Map Location: Telford Quadrangle (190-NE) and Flag Pond Quadrangle (190-SE). This stream is a tributary to Sill Branch which is a tributary to Clark Creek. It lies on the north side of Rich Mountain in the Cherokee Wildlife Area in Unicoi County, Tennessee.

Ownership Pattern: The entire 1.9 km (1.2 mi) of stream is on Forest Service land.

Elevation:
Mouth - 579 m (1,900 ft)
Head - 1,036 m (3,400 ft)

Aspect: Northwest

Stream Size: (Determined in June 1979 at 597 m - 1,960 ft elevation):
Width - 2.4 m (8.0 ft)
Depth - 12.5 cm (5.0 in)
Velocity - 0.2 meter per second (0.6 foot per second)
Cubic Meters Per Second - 0.05 (1.6 CFS)
Water Level Conditions - normal

Percent Grade: 23.7%

Barriers:
1. Falls; 21.3 m (70.0 ft) vertical height; at about 671 m (2,200 ft) elevation.
2. Falls; 7.6 m (25.0 ft) vertical height; at about 768 m (2,250 ft) elevation.

Water Quality: (Determined in June 1979)
pH - 6.8 at 597 m (1,960 ft) elevation
pH - 6.9 at 622 m (2,040 ft) elevation
Total Hardness - 20 ppm at 597 m (1,960 ft) elevation
Total Hardness - 10 ppm at 622 m (2,040 ft) elevation
Temperature - 18°C (64°F) at 597 m (1,960 ft) elevation
Temperature - 17°C (62°F) at 622 m (2,040 ft) elevation
Siltation - moderate

Sources of Pollution: Some siltation, probably from trail or steep surrounding area, but it does not appear to be a problem.

Other Species Present
No fish species collected.
Crayfish abundant.
Salamanders and aquatic insects.

Stream Conditions: The stream has an overall satisfactory pool-riffle ratio of about 50%. Riffle areas make up approximately 42% of the stream, while about 29% is made up of pools, 1% in flats, and the remaining 28% is in cascades or bedrock areas. The overall stream gradient is fairly steep. The stream bottom is composed of a mixture of gravel and small rubble with larger rocks and boulders. Some siltation is evident but not extreme. Logging debris is present but it helps create pools and cover, also, organic debris is quite heavy in some pools.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), maple (Acer spp.), rhododendron (Rhododendron spp.), and dogwood (Cornus florida).

Discussion: Tatum (1968) found brook trout in this stream, but stated that the population was very low at that time. He concluded that this was due to erosion caused by forest fires and logging. Bivens (1979) found no brook trout or any other fish species present in the stream. Apparently siltation was heavy and may have been a major factor in the loss of the brook trout population.

This stream is classified as potential brook trout water. Although, stream reproducing rainbow trout were collected in lower Sill Branch, none were found in the North Fork. Also, the first water fall would restrict their upstream movement. Siltation is moderate and no longer appears to be a problem. Therefore, stocking of native brook trout above the first falls may prove successful.

106 South Fork Sill Branch

Map Location: Telford Quadrangle (190-NE) and Flag Pond Quadrangle (190-SE). This stream is a tributary to Sill Branch which is a tributary to Clark Creek. It lies on the north side of Rich Mountain in the Cherokee Wildlife Area in Unicoi County, Tennessee.

Ownership Pattern: The entire 2.4 km (1.4 mi) of stream is on Forest Service land.

Elevation:
Mouth - 579 m (1,900 ft)
Head - 1,048 m (3,440 ft)

Aspect: North

Stream Size: (Determined in June 1979 at 579 m - 1,900 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 3.5 cm (1.4 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.02 (0.7 CFS)
Water Level Conditions - normal

Percent Grade: 21%

Barriers: 1. Falls; 2.7 m (9.0 ft) vertical height; at about 579 m (1,900 ft) elevation.

Water Quality: (Determined in June 1979):
pH - 6.8 at 579 m (1,900 ft)
pH - 6.9 at 640 m (2,100 ft)
Total Hardness - 10 ppm 579 m (1,900 ft)
Total Hardness - 15 ppm at 640 m (2,100 ft)
Temperature - 17°C (62°F) at 579 m (1,900 ft)
Temperature - 14°C (58°F) at 640 m (2,100 ft)
Siltation - moderate

Sources of Pollution: Siltation from areas where the trail crosses the stream, and from steep surrounding areas.

Other Species Present: Crayfish, salamanders, and aquatic insects abundant.

Stream Conditions: Overall, this is a small stream with a satisfactory pool-riffle of only about 40%. Riffle areas make up approximately 62% of the stream, while about 23% is made up of pools, no flats, and about 15% in cascades or bedrock areas. Cascades and bedrock is more prevelant in the upper reaches of the stream. In general, the gradient is fairly low with the upper stream portion being fairly steep. The stream bottom is composed of gravel and small rubble with small, flat rocks to larger rocks and boulders. Not many undercut or overhanging banks. Almost all pools have some siltation, and there is a considerable amount of organic debris present.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), maple (Acer spp.), birch (Betula spp.), and rhododendron (Rhododendron spp.).

Discussion: Tatum (1968) found brook trout in this stream, but stated that the population was very low at that time. He concluded that this was due to erosion caused by forest fires

and logging. Bivens (1979) found no brook trout or any other fish species present in the stream. Apparently siltation was heavy and may have been a major contributing factor in the loss of the brook trout population.

This stream is classified as potential brook trout water. Although stream reproducing rainbow trout were collected in lower Sill Branch, none were found in the South Fork. Also, there is a waterfall near the mouth that would restrict their upstream movement. Siltation is moderate and no longer appears to be a problem. Therefore, stocking native brook trout above the first falls may prove successful.

107 Devil Fork

Map Location: Telford Quadrangle (190-NE) and Flag Pond Quadrangle (190-SE). This stream is a tributary to Clark Creek. It lies east of Big Pine Ridge on the north side of Rich Mountain in the Cherokee Wildlife Area in Unicoi County, Tennessee.

Ownership Pattern: The entire 3.5 km (2.2 mi) of stream is on Forest Service land.

Elevation:
Mouth - 524 m (1,720 ft)
Head - 1,134 m (3,720 ft)

Aspect: North

Stream Size: (Determined in June 1979 at the mouth, 524 m (1,720 ft elevation):
Width - 2.7 m (9.0 ft)
Depth - 7.6 cm (3.0 in)
Velocity - 0.2 meter per second (0.7 foot per second)
Cubic Meters Per Second - 0.04 (1.3 CFS)
Water Level Conditions - normal

Percent Grade: 17.2%

Barriers:
1. Falls; 6.1 m (20.0 ft) vertical height; at about 585 m (1,920 ft) elevation.
2. Falls; 13.7 m (45.0 ft) vertical height; at about 646 m (2,120 ft elevation):
3. Falls; 7.9 m (26.0 ft) vertical height; about 671 m (2,200 ft) elevation.

Water Quality: (Determined 20 June 1969 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 6 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 14°C (58°F)

(Determined in June 1979):
pH - 6.9 at 524 m (1,720 ft) elevation
pH - 6.8 at 556 m (1,830 ft) elevation
pH - 6.7 at 585 m (1,920 ft) elevation
Total Hardness - 10 ppm at 524 m (1,720 ft) elevation
Total Hardness - 10 ppm at 556 m (1,830 ft) elevation
Total Hardness - 10 ppm at 585 m (1,920 ft) elevation
Temperature - 16°C (60°F) at 524 m (1,720 ft) elevation
Temperature - 14°C (58°F) at 585 m (1,920 ft) elevation
Siltation - lower portion is heavy
- upper portion is light

Sources of Pollution: Heavy siltation from Longarm Branch in the lower portion of the stream.

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Mottled sculpin (Cottus bairdi)
Blacknose dace (Rhinichthys atratulus)
Longnose dace (Rhinichthys cataractae)
Saffron shiner (Notropis rubricroceus) - collected only near the mouth

Fish Collected: June 1979 by Bivens
Rainbow Trout Average Length: 129.9 mm (5.1 in)
Number of Rainbow Trout Greater Than 100 mm: 26
Number of Rainbow Trout Less Than 100 mm: 8

Stream Conditions: The stream has an overall pool-riffle ratio of about 60%, and the pools and riffles are fairly deep and provide good cover for fish. There is a good mixture of pools and riffles with a lot of undercut banks. Riffle areas make up approximately 55% of the stream while about 29% is made up of pools, 2% in flats, and the remaining 14% is in cascades or bedrock areas. The overall gradient is fairly steep. The stream bottom is composed of very fine gravel to rubble with larger rocks and boulders. Siltation is heavy below the junction of Longarm Branch, but above this junction siltation is light. There is some organic debris present in pools and riffles.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), birch (Betula spp.), basswood (Tilia americana), rhododendron (Rhododendron spp.), and dog hobble (Leucothoe editorum).

Discussion: Tatum (1968) listed this stream as having brook trout. The TWRA (1969e) stream survey report listed brook trout as the primary species present in Devil Fork. However, Bivens (1979) found no brook trout present. An allopatric, naturally reproducing population of rainbow trout exists from the mouth at Clark Creek to about 1.6 km (1.0 mi) above the mouth and about 0.2 km (0.2 mi) below the second falls. No other fish species were collected above the second falls.

This stream is listed as potential brook trout water. Siltation is not a problem except below the confluence with Longarm Branch and other stream conditions are good. The only current problem is with the rainbow trout. However, brook trout could be stocked in above the second falls where no rainbow trout now exist. Another possibility is to remove the rainbow trout from the section above the first falls and stock brook trout here also.

108 Longarm Branch

Map Location: Flag Pond Quadrangle (190-SE). This stream is a tributary to Devil Fork which is a tributary to Clark Creek. It lies east of Longarm Ridge on the north side of Rich Mountain in the Cherokee Wildlife Area in Unicoi County, Tennessee.

Ownership Pattern: The entire 3.5 km (2.2 mi) of stream is on Forest Service land.

Elevation:
Mouth - 561 m (1,840 ft)
Head - 939 m (3,080 ft)

Aspect: Northeast

Stream Size: (Determined in June 1979 at the mouth, at 651 m - 1,340 elevation):
Width - 2.1 m (7.0 ft)
Depth - 7.6 cm (3.0 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.05 (1.7 CFS)
Water Level Conditions - normal

Percent Grade: 10.7%

Barriers: None

Water Quality: (Determined 20 June 1969 by TWRA stream survey):
pH - 6.8
Hardness - 17 ppm
M.O. Alkalinity - 9 ppm
Temperature - 15°C (59°F)

(Determined in June 1979 near the mouth):
pH - 6.7
Total Hardness - 15 ppm
Temperature - 15°C (59°F)
Siltation - heavy

Sources of Pollution: Siltation from adjacent forest road and road crossings.

Other Fish Species Present:
Mottled sculpin (Cottus bairdi)
Blacknose dace (Rhinichthys atratulus)

Stream Conditions: The stream has an overall pool-riffle ratio of only about 20%, and it is mostly shallow riffle areas with very few small pools that are not very deep and do not provide much cover for fish. Riffles make up approximately 67% of the stream, while about 18% is made up of pools, 2% in flats, and the remaining 13% is in cascades or bedrock areas. The overall stream gradient is moderate. The stream bottom is composed of very fine gravel to gravel with small rubble and only a few larger boulders. Overall, the stream is very shallow with several small cascade areas. There are several areas where downed trees and logs help to create pools. Siltation is heavy and organic debris is present in pools.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up of predominantly of yellow poplar (Liriodendron tulipfera), birch (Betula spp.), maple (Acer spp.), rhododendron (Rhododendron spp.), dogwood (Cornus florida), and witch hazel (Hamamelis virginiana).

Discussion: Tatum (1968) found brook trout in this stream, but stated that the population was very low at that time. He concluded that this was due to erosion caused by forest fires and logging. The TWRA (1969e) stream survey report listed brook trout along with rainbow trout (Salmo gairdneri) as the primary species present in Longarm Branch. Bivens (1979)

found no trout species present and collected only dace and sculpin in the lower portion of the stream.

This stream probably has no future potential for brook trout or other trout management. Heavy siltation, proximity to the forest road, lack of barriers, small size, and poor stream conditions make it seem impractical to manage for brook trout.

109 Chigger Branch

Map Location: Flag Pond Quadrangle (190-SE). This stream is a tributary to Clark Creek. It lies east of Chigger Ridge on the north side of Rich Mountain. The stream is located in the Cherokee Wildlife Area in Unicoi County, Tennessee.

Ownership Pattern: The entire 2.6 km (1.6 mi) of stream is on Forest Service land.

Elevation:
Mouth - 611 m (2,005 ft)
Head - 1,012 m (3,320 ft)

Aspect: North

Stream Size: (Determined in July 1979 at the mouth, 611 m - 2,005 ft elevation):
Width - 1.7 m (5.5 ft)
Depth - 0.7 cm (3.8 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.04 (1.4 CFS)
Water Level Conditions - normal

Percent Grade: 15.6%

Barriers: 1. Large cascades; approximately 30.0 m (100.0 ft) vertical height; starts at about 780 m (2,560 ft) elevation.

Water Quality: (Determined 20 June 1969 by TWRA stream survey):
pH - 6.5
Dissolved Oxygen - 7 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 14°C (58°F)

(Determined in July 1979 near the mouth):
pH - 6.8
Total Hardness - 8 ppm
Temperature - 16°C (60°F)
Siltation - moderate

Sources of Pollution: Siltation from areas where trail crossed the stream.

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)
Mottled sculpin (Cottus bairdi)

Fish Collected: July 1979 by Bivens
Rainbow Trout Average Length: 123.4 (4.9 in)
Number of Rainbow Trout Greater Than 100 mm: 5
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: The stream has an overall pool-riffle ratio of only about 25%, and it is mostly small, shallow riffle areas with small pools that don't provide much cover for fish. Riffle areas make up approximately 56% of the stream, while about 31% is made up of pools, 3% in flats, and the remaining 10% is in cascades or bedrock areas. The overall stream gradient is moderate. The stream bottom is composed of fine gravel to small rubble with larger rocks and only a few boulders. There are many areas with log jams where the stream disappears into the gravel for a short distance. Siltation is not extremely heavy, but there is a lot of organic debris present.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), and rhododendron (Rhododendron spp.)

Discussion: Tatum (1968) found brook trout in this stream, but stated that the population was very low at that time. He concluded that this was due to erosion caused by forest fires and logging. The TWRA (1969e) stream survey report listed brook trout as the primary species present. Bivens (1979) found no brook trout present and collected only a few rainbow trout in the lower section of the stream.

This stream is classified as potential brook trout water. However, there are no barriers near the mouth and rainbow trout are beginning to move in from Clark Creek. Also, stream improvements are needed to increase cover and to remove some

of the log jams that cause the stream to flow into the substrate. Siltation is not very heavy and does not appear to be a major problem, therefore, stocking brook trout may prove successful with or without these stream improvements.

110 Briar Creek

Map Location: Erwin Quadrangle (199-NW) and Unicoi Quadrangle (199-NE). This stream is a tributary to Dry Creek. Its headwaters begin on the west side of Buffalo Mountain. The stream is located in Washington County, Tennessee.

Ownership Pattern: About 0.5 km (0.3 mi) of stream at the mouth is on private land, and the remaining 4.7 km (2.9 mi) of stream is on Forest Service land.

Elevation:
Mouth - 564 m (1,850 ft)
Head - 901 m (2,955 ft)

Aspect: Southwest

Stream Size: (Determined above the man-made barrier at about 675 m - 2,215 ft elevation):
Average Width - 3.1 m (10.2 ft)
Velocity - 0.7 meter per second (2.3 feet per second)
Cubic Meters Per Second - 0.15 (4.9 CFS)

Percent Grade: 6.5%

Barriers:
1. Falls; approximately 6.1 m (20.0 ft) vertical height; at about 634 m (2,080 ft) elevation
2. Man-made barrier; approximately 1.5 m (5.0 ft) vertical height; at about 675 m (2,215 ft) elevation

Water Quality: (Determined 11 September 1968 by TWRA stream survey):
pH - 7.2
Dissolved Oxygen - 9 ppm
Hardness - 51 ppm
M.O. Alkalinity - 51 ppm
Temperature - 17°C (62°F)

(Determined at about 675 m - 2,215 ft elevation):
pH - 6.8 to 7.3 on various dates
Conductivity - 27 to 30 umhos/cm on various dates

Sources of Pollution: Not Recorded

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)

Stream Conditions: Approximately 45% of the stream is estimated to be in pools. The stream bottom is composed primarily of gravel, rubble, and boulders.

Vegetative Conditions: The local watershed has 100% forest cover. hade or canopy is good over 100% of the stream.

Discussion: Prior to 1983, Briar Creek had an allopatric rainbow trout population and the stream is only mentioned here because of the efforts made by Dr. Jerry W. Nagel of East Tennessee State University to establish a reproducing brook trout population. His original goal was to remove rainbow trout from above a barrier and introduce native brook trout from other area streams in the renovated portion of Briar Creek.

A 1.5 m (5.0 ft) rock and mortar barrier was constructed in September 1983 at about 675 m (2,215 ft) elevation. Rainbow trout were removed from the section of stream above the barrier and 74 native brook trout were stocked in October 1983. The brook trout used for stocking came from East Fork Beaverdam Creek in Johnson County, Tennessee and George Creek in Carter County, Tennessee.

The brook trout study section of the stream begins at about 675 m (2,215 ft) elevation at the man-made barrier and goes up to about 719 m (2,360 ft) elevation at the Forest Service road crossing, a distance of about 1.3 km (0.8 mi). Allopatric rainbow trout occur both below and above the brook trout section.

Future plans include long-term monitoring and research on the ecology of brook trout and their interactions with rainbow trout assuming that a viable reproducing population of brook trout becomes established in the stream. Most of the information on this stream came from the Cherokee/Buffalo Mountain Trout Study Project proposal and personal communication with Jerry W. Nagel and Alan Polk.

111 Broad Shoal Creek (California Creek)

Map Location: Erwin Quadrangle (199-NW) and Chestoa Quadrangle (199-SW). This stream is a tributary to the Nolichucky River. Its headwaters begin on the north side of Rich Mountain and the stream is located in Unicoi County, Tennessee.

Ownership Pattern: The entire 6.6 km (1.1 mi) of stream is on Forest Service land.

Elevation:
Mouth - 482 m (1,580 ft)
Head - 1,042 m (3,420 ft)

Aspect: Northeast

Stream Size: (Determined 12 May 1983 at the mouth, at 482 m - 1,580 ft elevation):
Width - 3.7 m (12.0 ft)
Depth - 10.9 cm (4.3 in)
Velocity - 0.6 meter per second (1.9 foot per second)
Cubic Meters Per Second - 0.20 (6.5 CFS)
Water Level Conditions - slightly low

Percent Grade: 8.5%

Barriers: Several barrier falls; locations not recorded.

Water Quality: (Determined 20 June 1969 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 9 ppm
Hardness - 34 ppm
M.O. Alkalinity - 17 ppm
Temperature - 18°C (65°F)

Sources of Pollution: None

Other Fish Species Present:
Rainbow trout (*Salmo gairdneri*)
Mottled sculpin (*Cottus bairdi*)
Central stoneroller (*Campostoma anomalum*)
Northern hog sucker (*Hypentelium nigricans*)
Blacknose dace (*Rhinichthys atratulus*)

Fish Collected: 12 May 1983 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 15
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: The stream has a pool-riffle ratio of about 80%. Riffle areas make up approximately 30% of the stream, while about 40% is in pools, 5% in flats, and the remaining 25% is in cascades or bedrock areas. It has many deep pools that have boulders or bedrock ledges that provide good cover for fish. The stream bottom is primarily gravel, rubble, bedrock, and boulders. Siltation is light.

Vegetative Conditions: The streambank has about 98% overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), birch (Betula spp.), maple (Acer spp.), oak (Quercus spp.), alder (Alnus spp.), dog hobble (Leucothoe editorum), and rhododendron (Rhododendron spp.). About 2% has no overstory and little or no shade providing understory.

Discussion: The TWRA (1969e) stream survey report listed brook trout and rainbow trout as the primary species present in Broad Shoal Creek. Elsen (1983) found only rainbow trout present in the stream. He reported that the stream has excellent pool development along with very good water quality and an allopatric, stream reproducing rainbow trout population. This stream probably has no future management potential for brook trout and it should remain as a wild rainbow trout stream.

112 California Creek (Looking Glass Branch)

Map Location: Erwin Quadrangle (199-NW). This stream is a tributary to the Nolichucky River and lies northwest of Looking Glass Mountain. It is located in the Cherokee Wildlife Area in Unicoi County, Tennessee.

Ownership Pattern: The entire 2.3 km (1.4 mi) of stream is on Forest Service land.

Elevation:
Mouth - 486 m (1,595 ft)
Head - 713 m (2,340 ft)

Aspect: Northeast

Stream Size: (Determined in August 1979 at the mouth, 486 m - 1,595 ft elevation):
Width - 2.0 m (6.5 ft)
Depth - 10.9 cm (4.3 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.03 (1.1 CFS)
Water Level Conditions - slightly low

Percent Grade: 10.1%

Barriers: None

Water Quality: (Determined 20 June 1969 by TWRA stream survey):
pH - 6.5

Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 17°C (63°F)

(Determined in August 1979 near the mouth):
pH - 7.5
Total Hardness - 20 ppm
Temperature - 19°C (67°F)
Siltation - medium

Sources of Pollution: Siltation probably from steep surrounding areas.

Other Species Present:
Blacknose dace (Rhinichthys atratulus)
Crayfish and salamanders abundant.

Stream Conditions: The stream has an overall pool-riffle ratio of about 35%, it is mostly shallow, narrow riffles with only a few good size pools. Riffle areas make up approximately 48% of the stream, while about 25% is made up of pools, 7% in flats, and the remaining 20% is in cascades or bedrock areas. There are several areas with cascades and bedrock and the overall stream gradient is moderate. The stream bottom is composed of some sand to fine gravel and small rubble with larger rocks and boulders. Siltation is medium and there is some organic debris in the pools.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), maple (Acer spp.), birch (Betula spp.), rhododendron (Rhododendron spp.), and dog hobble (Leucothoe editorum). There are no areas with overhanging vegetation and the understory is fairly open.

Discussion: Tatum (1968) found brook trout in the headwaters, but stated that the population was very low at that time. He concluded that this was due to erosion caused by forest fires and logging. The TWRA (1969e) stream survey report listed brook trout along with rainbow trout (Salmo gairdneri) as the primary species present. Bivens (1979) found no trout species present at all, only a few blacknose dace were collected in the lower section of the stream. Stream siltation may have been a contributing factor to the loss of the brook trout. There are no natural barriers, but there are no competing trout species present either. Siltation is a problem in the stream; however, with stream improvements

brook trout stocking may prove successful. One problem with stocking the stream though, is the limited access. Access with a vehicle is limited to the headwaters only and this logging road is very rough. Therefore, stocking of this stream is probably not practical.

113 Right Prong Rock Creek

Map Location: Unicoi Quadrangle (199-NE) and Huntdale Quadrangle (199-SE). This stream is a tributary of Rock Creek and runs through the Rock Creek Camp Ground area in Unicoi County, Tennessee.

Ownership Pattern: The entire 3.9 km (2.4 mi) of stream is on Forest Service land.

Elevation:
Mouth - 672 m (2,205 ft)
Head - 1,012 m (3,320 ft)

Aspect: Northeast

Stream Size: (Determined in July 1979 at the mouth, 672 m - 2,205 ft elevation):
Width - 5.1 m (16.8 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.2 (6.7 CFS)
Water Level Conditions - slightly high

Percent Grade: 8.8%

Barriers: None

Water Quality: (Determined 20 June 1969 by TWRA stream survey):
pH - 5.8
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 15°C (59°F)

(Determined in July 1979 near the mouth)
pH - 6.7
Total Hardness - 5 ppm
Temperature - 16°C (60°F)
Siltation - medium

Sources of Pollution: Siltation and runoff from the highway that parallels the stream.

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Mottled sculpin (Cottus bairdi)
Blacknose dace (Rhinichthys atratulus)
Longnose dace (Rhinichthys cataractae)

Fish Collected: July 1979 by Bivens
Rainbow Trout Average Length: 87.8 mm (3.5 in)
Number of Rainbow Trout Greater Than 100 mm: 3
Number of Rainbow Trout Less Than 100 mm: 27

Stream Conditions: The stream has an overall mixture of pools and riffles of about 40%, with lots of riffles that are deep and wide. Riffles make up approximately 68% of the stream, while about 28% is made up of pools, 2% in flats, and the remaining 2% is in cascades or bedrock areas. The overall stream gradient is moderate. There are several areas with undercut banks and lots of overhanging brush. The stream bottom is composed of sand with fine gravel to rubble and large rocks and boulders abundant. Siltation is medium and organic debris is present in pools.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), maple (Acer spp.), yellow poplar (Liriodendron tulipfera), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.). There are several areas of streambank with overhanging rhododendron, especially in the upper portion of the stream.

Discussion: Tatum (1968) listed this stream as having brook trout. The TWRA (1969e) stream survey also listed brook trout along with rainbow trout as the primary species present (the stream was recorded as an unknown tributary to Rock Creek). However, Bivens (1979) found no brook trout present. An allopatric rainbow trout population was found in the lower portion of the stream from the mouth to approximately 1.7 km (1.1 mi) above the mouth. One large pool just below the first highway bridge produced 26 rainbow trout and many more were seen to escape. Only 2 out of 26 rainbow trout collected were over 100.0 mm in length and most of the fish appeared to be in poor condition.

This stream has been listed as unsuitable for stocking brook trout due to the well established rainbow trout population and poor stream conditions. It also is located under a highway for most of its length. No brook trout management is suggested.

114 Dick Creek

Map Location: Unicoi Quadrangle (199-NE). This stream is a tributary to North Indian Creek and lies just northeast of Rattlesnake Ridge in Unicoi County, Tennessee.

Ownership Pattern: The lower 0.3 km (0.2 mi) of stream is on private land, and the remaining 5.8 km (3.6 mi) of stream is on Forest Service land.

Elevation:
Mouth - 643 m (2,110 ft)
Head - 1,280 m (4,200 ft)

Aspect: North

Stream Size: (Determined in July 1979 at the lower Forest Service boundary, at 658 m - 2,160 ft elevation):
Width - 4.6 m (15.0 ft)
Depth - 14.7 cm (5.8 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.21 (7.0 CFS)
Water Level Conditions - high

Percent Grade: 10.4%

Barriers:
1. Falls; 4.9 m (16.0 ft) vertical height; at about 805 m (2,640 ft) elevation.
2. Falls; 6.1 m (20.0 ft) vertical height; at about 902 m (2,960 ft) elevation.
3. Falls; 18.9 m (62.0 ft) vertical height; at about 911 m (2,990 ft) elevation.
4. Falls; 6.7 m (22.0 ft) vertical height; at about 914 m (3,000 ft) elevation.

Water Quality: (Determined 20 June 1969 by TWRA stream survey):
pH - 6.2
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 17°C (63°F)

(Determined in July 1979):
pH - 6.2 at 657 m (2,155 ft) elevation
pH - 5.9 at 756 m (2,480 ft) elevation
Total Hardness - 5 ppm at 657 m (2,155 ft) elevation
Total Hardness - 4 ppm at 756 m (2,480 ft) elevation

Temperature - 15°C (59°F)
Siltation - medium heavy

Sources of Pollution: Siltation from general bank erosion along most of the stream, also from the forest road and road crossings.

Other Species Present:
No fish species collected.
Crayfish, salamanders, and aquatic insects.

Stream Conditions: The stream has an overall mixture of pools and riffles of about 35%, with the lower section of the stream being almost completely riffle areas with very few pools. The upper portion of the stream has a much better pool-riffle ratio. Riffles make up approximately 66% of the stream, while about 25% is made up of pools, 1% in flats, and the remaining 8% is in cascades or bedrock areas. There are some areas with undercut and overhanging banks, but not very many. The overall stream gradient is moderate. The stream bottom is composed of sand, fine gravel to small rubble with larger rocks and boulders. Siltation is medium heavy and organic debris is present.

Vegetative Conditions: The streambank has 100% overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), maple (Acer spp.), birch (Betula spp.), rhododendron (Rhododendron spp.), witch hazel (Hamamelis virginiana), dog hobble (Leucothoe editorum), and mountain laurel (Kalmia latifolia). Some areas in the lower section of the stream are so snarled and tangled with rhododendron and brush that they are almost impassable. The headwaters also have a lot of overhanging rhododendron.

Discussion: Tatum (1968) listed this stream as having brook trout. The TWRA (1969e) stream survey listed only rainbow trout (Salmo gairdneri) as the primary species present. However, Bivens (1979) found no fish species present in the stream at all. Siltation from erosion and logging within recent years may have contributed to the loss of the brook trout population.

This stream is classified as potential brook trout water. With some stream improvements, mainly a reduction of siltation, subsequent stocking of brook trout may prove successful, especially in the upper portion of the stream above the barriers.

115 Rocky Branch

Map Location: Unicoi Quadrangle (199-NE). This stream is a tributary to North Indian Creek. Its headwaters begin on the north side of Unaka Mountain near Stamping Ground Ridge in Unicoi County, Tennessee.

Ownership Pattern: The entire 3.5 km (2.2 mi) of stream is on Forest Service land.

Elevation:
Mouth - 671 m (2,200 ft)
Head - 1,317 m (4,320 ft)

Aspect: Northwest

Stream Size:
Average Width - 1.2 m (4.0 ft)
Width Varies - 0.6 to 2.4 m (2.0 to 8.0 ft)
Average Pool Depth - 20.3 cm (8.0 in)
Average Riffle Depth - 7.6 cm (3.0 in)

Barriers: Not Recorded

Water Quality: (Determined 20 June 1969 by TWRA stream survey):
pH - 5.5
Dissolved Oxygen - 3 ppm
Hardness - 9 ppm
M.O. Alkalinity - 9 ppm
Temperature - 14°C (58°F)

Sources of Pollution: Not Recorded

Other Species Present:
No fish species collected.
Mayflies (Ephemeroptera)
Salamanders

Stream Conditions: About 45% of the stream is estimated to be made up of pools. The stream bottom is composed primarily of rubble, gravel, and boulders.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation that provides shade or canopy.

Discussion: Rocky Branch flows from Unaka Mountain, which was severely burned in 1926. The water-holding capacity of the watershed is poor, and stream flows are flashy. The stream-

bed is mostly small and large rubble that gets rearranged every time a flood occurs. There is about 1.6 km (1.0 mi) of stream that may support fish and the width is about 1.8 m (6.0 ft). The Forest Service has no records of Rocky Branch ever holding trout. The TWRA (1969e) stream survey report listed the stream as having minnows (Cyprinid spp.) present, but no fish at all were found in 1979. This stream is mentioned here only because it was stocked with about 300 Owhi strain brook trout fingerlings in 1980 (Elsen, personal communication).

116 Red Fork

Map Location: Unicoi Quadrangle (199-NE). This stream is a tributary to North Indian Creek and lies just southeast of Stamping Ground Ridge in Unicoi County, Tennessee.

Ownership Pattern: The lower 2.1 km (1.3 mi) of stream is on private land, and the remaining 4.2 km (2.6 mi) of stream is on Forest Service land.

Elevation:
Mouth - 783 m (2,570 ft)
Head - 1,487 m (4,880 ft)

Aspect: Northeast

Stream Size: (Determined in August 1979 at the lower Forest Service boundary at 948 m - 3,110 ft elevation):
Width - 3.0 m (10.0 ft)
Depth - 15.2 cm (6.0 ft)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.12 (4.0 CFS)
Water Level Conditions - high

Percent Grade: 11.2%

Barriers: None

Water Quality: (Determined in August 1979 at 948 m - 3,110 ft elevation):
pH - 6.0
Total Hardness - 3 ppm
Temperature - 15°C (59°F)
Siltation - medium

Sources of Pollution: Siltation from forest road and road crossings.

Other Species Present:
Salamanders
Crayfish
Aquatic insects

Stream Conditions: The stream has an overall mixture of pools and riffles of about 45%, with the lower section having more riffles than pools and the upper portion having more cascades. Many of these cascades terminate in deep pools. Riffles make up approximately 52% of the stream, while about 28% is made up of pools, 2% in flats, and the remaining 18% is in cascades or bedrock areas. There are only a few areas with undercut banks. The overall stream gradient is moderate with the upper section being quite steep. The stream bottom is composed of fine gravel to small rubble with larger rocks and boulders. Siltation is medium and lots of organic debris is present.

Vegetative Conditions: The streambank has 100% overstory and understory vegetation made up predominantly of birch (Betula spp.), hemlock (Tsuga canadensis), dog hobble (Leucothoe editorum), and rhododendron (Rhododendron spp.). There are several areas with overhanging rhododendron and down trees, especially in the upper portion of the stream.

Discussion: Tatum (1968) found brook trout in this stream, but stated that the population was very low at that time. He concluded that this was due to erosion caused by forest fires and logging. The TWRA (1969e) stream survey listed brook trout along with rainbow trout (Salmo gairdneri) as the primary species present. Bivens (1979) found no fish present in the stream at all. Only that portion of stream that is on Forest Service land was surveyed in 1979, and the lower 2.1 km (1.3 mi) have not been checked. Heavy stream siltation may have been a major contributing factor in the loss of the trout population.

This stream is classified as potential brook trout water. No natural barriers exist but there are no competitive trout species either. Also, stream conditions appear good except for siltation. Therefore, stocking of brook trout may prove successful with some stream improvements.

117 Clear Fork

Map Location: Unicoi Quadrangle (199-NE). This stream is a tributary to Red Fork which is a tributary to North Indian Creek. Its headwaters begin on the east side of Unaka Mountain just northwest of Low Gap in Unicoi County, Tennessee.

Ownership Pattern: The lower 1.3 km (0.8 mi) of stream is on private land, and the remaining 1.9 km (1.2 mi) of stream is on Forest Service land.

Elevation:
Mouth - 942 m (3,090 ft)
Head - 1,262 m (4,140 ft)

Aspect: Northeast

Stream Size: (Determined 23 May 1984 at 1,000 m - 3,280 ft elevation):
Width - 2.9 m (9.4 ft)
Depth - 9.1 cm (3.6 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.1 (3.4 CFS)
Water Level Conditions - normal

Percent Grade: 9.9%

Barriers: None

Water Quality: (Determined 20 June 1969 by TWRA stream survey):
pH - 6.5
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Average Temperature - 15°C (59°F)

(Determined 23 May 1984 at 1,000 m - 3,280 ft elevation):
pH - 6.3
Total Hardness - 6 ppm
Temperature - 12°C (54°F)
Siltation - medium

Sources of Pollution: Siltation from adjacent forest road.

Other Species Present:
Rainbow trout (*Salmo gairdneri*)
Mayflies (Ephemeroptera)
Crayfish
Salamanders

Fish Collected: 23 May 1984 by Bivens
Brook Trout Average Length: 123.5 mm (4.9 in)
Brook Trout Average Weight: 21.5 g (0.8 oz)
Average K Brook Trout Greater Than 100 mm: 1.14
Number of Brook Trout Greater Than 100 mm: 2
Number of Brook Trout Less Than 100 mm: 0

Rainbow Trout Average Length: 140.4 mm (5.5 in)
Rainbow Trout Average Weight: 33.7 g (1.2 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.22
Number of Rainbow Trout Greater Than 100 mm: 20
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: Overall, the stream is fairly small with lots of riffles and a few good pools. The lower stream apparently has adequate cover for trout. The stream bottom is composed of sand, fine gravel, and rubble with rocks and boulders. Siltation is medium.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), maples (Acer spp.), and rhododendron (Rhododendron spp.).

Discussion: The TWRA (1969e) stream survey report listed brook trout along with rainbow trout as the primary species present in Clear Fork. Bivens (1984) found rainbow trout throughout most of the stream and a remnant brook trout population in the extreme headwaters. Only two brook trout were collected at 1,073 m (3,520 ft) elevation along with rainbow trout and the stream is estimated to have about 0.3 km (0.2 mi) of sympatric brook/rainbow trout water.

The brook trout population in Clear Fork has been pushed to the limit of suitable habitat and is clearly in a state of decline. No management option can be suggested other than stream renovation and rainbow trout removal or possibly relocating what brook trout are left, in other area streams that have no other trout species present.

118 Granny Lewis Creek

Map Location: Chestoa Quadrangle (199-SW). This stream is a tributary to South Indian Creek. It lies west of Temple Hill and No Business Ridge in Unicoi County, Tennessee.

Ownership Pattern: The lower 0.6 km (0.4 mi) of stream is on private land, and the remaining 7.2 km (4.5 mi) of stream is on Forest Service land.

Elevation:
Mouth - 536 m (1,760 ft)
Head - 1,048 m (3,440 ft)

Aspect: Northwest

Stream Size: (Determined in July 1979 at 559 m - 1,835 ft elevation):
Width - 6.3 m (20.8 ft)
Depth - 23.3 cm (9.3 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.58 (19.3 CFS)
Water Level Conditions - high

Percent Grade: 6.5%

Barriers: None

Water Quality: (Determined 27 June 1969 by TWRA stream survey):
pH - 5.5
Dissolved Oxygen - 7 ppm
Hardness - 17 ppm
M.O. Alkalinity - 9 ppm
Temperature - 18°C (65°F)

(Determined in July 1979 at 692 m - 2,270 ft elevation):
pH - 6.4
Total Hardness - 5 ppm
Temperature - 15°C (59°F)
Siltation - moderate to slight

Sources of Pollution: Timber harvest operation was in process in July of 1979 around Big Branch tributary. Some areas on Big Branch have been cut all the way to the streambank. Siltation is coming from logging operations and the forest road.

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)
Longnose dace (Rhinichthys cataractae)
Central stoneroller (Campostoma anomalum)
Mottled sculpin (Cottus bairdi)

Fish Collected: July 1979 by Bivens
Rainbow Trout Average Length: 106.9 mm (4.2 in)
Number of Rainbow Trout Greater Than 100 mm: 14
Number of Rainbow Trout Less Than 100 mm: 15

Stream Conditions: This stream has a satisfactory pool-riffle ratio of about 40%. It is mostly riffles and cascades, however, most cascades have large deep pools below them, especially in the lower section, and riffle areas are deep and wide with many large rocks and boulders that provide cover for fish. Riffle areas make up approximately 43% of the stream, while about 27% is made up of pools, only about 3% in

flats, and the remaining 27% is in cascades or bedrock areas. There are also a few areas with undercut banks. The overall stream gradient is moderate. The stream bottom is composed of lots of sand to small rubble with larger rocks and boulders. There are many areas in the upper portion where the bottom is composed of nothing but sand and bedrock. There is lots of sand, but the siltation is slight to moderate.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), birch (Betula spp.), maple (Acer spp.), rhododendron (Rhododendron spp.), and dog hobble (Leucothoe editorum). The upper section of the stream gets snarled and tangled with debris and rhododendron.

Discussion: Tatum (1968) listed this stream as having brook trout in the headwaters. The TWRA (1969e) stream survey report listed brook trout along with rainbow trout as the primary species present. However, Bivens (1979) found only rainbow trout present in the main section of the stream. An allopatric, stream reproducing rainbow trout population now exists from the lower Forest Service boundary to approximately 6.3 km (3.9 mi) into the headwater. This watershed has had recent timber harvesting, and currently (July 1979), logging operations are taking place in the Big Branch tributary area. This stream probably has no future potential for brook trout management due to the firmly established rainbow trout population.

119 Big Branch

Map Location: Chestoa Quadrangle (199-SW). This stream is a tributary to Granny Lewis Creek. Its headwaters begin on the east side of Laurel Ridge near Hollybush Gap. The stream is located in Unicoi County, Tennessee.

Ownership Pattern: The entire 1.4 km (0.9 mi) of stream is on Forest Service land.

Elevation:
Mouth - 674 m (2,210 ft)
Head - 872 m (2,860 ft)

Aspect: North

Stream Size: (Determined 18 May 1984 at the mouth, at 674 m - 2,210 ft elevation):
Width - 2.1 m (6.8 ft)
Depth - 11.4 cm (4.5 in)

Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meter Per Second - 0.06 (2.0 CFS)
Water Level Conditions - normal

Percent Grade: 13.8%

Barriers: Not Recorded

Water Quality: (Determined 27 June 1969 by TWRA stream survey):
pH - 5.5
Dissolved Oxygen - 7 ppm
Hardness - 17 ppm
M.O. Alkalinity - 9 ppm
Temperature - 17°C (63°F)

(Determined 18 May 1984 at 674 m - 2,210 ft elevation):
pH - 7.3
Total Hardness - 7 ppm
Temperature - 9°C (48°F)
Siltation - medium to heavy

Sources of Pollution: Not Recorded

Other Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)
Stoneflies (Plecoptera)
Crayfish
Salamanders

Fish Collected: 18 May 1984 by Bivens
Rainbow Trout Average Length: 124.5 mm (4.9 in)
Rainbow Trout Average Weight: 23.0 g (0.8 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.19
Number of Rainbow Trout Greater Than 100 mm: 2
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: The stream is small and shallow. It is mostly riffles with only a few shallow pools and some bedrock occurs. The stream bottom is composed of sand, rubble, rocks, and boulders. Siltation is medium to heavy and lots of logging debris is left in the stream.

Vegetative Conditions: The stream bank has approximately 40% overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera) maples (Acer spp.), and rhododendron (Rhododendron spp.). About 60% of the lower stream is open with only rhododendron

along the banks. This portion was being clearcut to the stream banks in 1979 and I observed logs being skid through the stream. Second growth vegetation is now coming back and old skid roads have been sowed with grass.

Discussion: The TWRA (1969e) stream survey report listed brook trout as the primary species present in Big Branch. However, Bivens (1984) found no brook trout present, and only two rainbow trout were collected near the mouth. The stream is small and without much cover for fish. It probably has no trout management potential due to small size and stream conditions.

120 Higgins Creek (Little Higgins Creek)

Map Location: Chestoa Quadrangle (199-SW) and Flag Pond Quadrangle (190-SE). This stream is a tributary to South Indian Creek. Its headwaters begin on the north side of Higgins Ridge east of Wilson Knob in Unicoi County, Tennessee.

Ownership Pattern: The entire 8.0 km (5.0 mi) of stream is on private land, except for a small section of Forest Service land that crosses the stream in the lower elevations near the mouth.

Elevation:
Mouth - 550 m (1,805 ft)
Head - 1,315 m (4,315 ft)

Aspect: East

Stream Size:
Average Width - 2.4 m (8.0 ft)
Width Varies - 0.9 to 5.2 m (3.0 to 17.0 ft)
Average Pool Depth - 0.3 m (1.0 ft)
Average Riffle Depth - 10.2 cm (4.0 in)

Percent Grade: 9.5%

Barriers:
1. Falls; approximately 9.1 m (30.0 ft) vertical height; at about 841 m (2,760 ft) elevation.
2. Cascades; approximately 4.6 m (15.0 ft) change in height; at about 920 m (3,020 ft) elevation.
3. Falls; approximately 15.2 m (50.0 ft) vertical height; at about 957 m (3,140 ft) elevation.

Water Quality: (Determined in 1950 by Shields):
pH - 6.9
Maximum Temperature - 17°C (62°F)

(Determined 27 June 1969 by TWRA stream survey):
pH - 6.5
Dissolved Oxygen - 7 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 18°C (65°F)

(Determined 18 May 1979 at about 683 m - 2,240 ft elevation):
pH - 7.0
Dissolved Oxygen - 11 ppm
Hardness - 34 ppm
Alkalinity - 17 ppm
Temperature - 12°C (54°F)
Siltation - very low

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri) - in the lower section of the stream only.

Fish Collected: May 1979 by Whitworth and Strange
Brook Trout Average Length: 182.0 mm (7.2 in)
Brook Trout Average Weight: 82.1 g (2.9 oz)
Average K Brook Trout Greater Than 100 mm: 1.26
Number of Brook Trout Greater Than 100 mm: 6
Number of Brook Trout Less Than 100 mm: 10
Rainbow Trout Average Length: 152.0 mm (6.0 in)
Rainbow Trout Average Weight: 39.8 g (1.4 oz)
Average K Rainbow Trout Greater Than 100 mm: 0.93
Number of Rainbow Trout Greater Than 100 mm: 10
Number of Rainbow Trout Less Than 100 mm: 2

30 May 1984 by Bivens
Brook Trout Average Length: 138.1 mm (5.4 in)
Brook Trout Average Weight: 33.9 g (1.2 oz)
Average K Brook Trout Greater Than 100 mm: 1.29
Number of Brook Trout Greater Than 100 mm: 8
Number of Brook Trout Less Than 100 mm: 1
Rainbow Trout Average Length: 168.1 mm (6.6 in)
Rainbow Trout Average Weight: 55.4 g (2.0 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.17
Number of Rainbow Trout Greater Than 100 mm: 22
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: About 35% of the stream is estimated to be made up of pools. The stream bottom is composed mostly of large rubble to boulders. Siltation is slight.

Vegetative Conditions: The streambank has approximately 90% forest cover and the stream is fairly open.

Discussion: Shields (1950) described the headwaters of Higgins Creek as good brook trout producing water. At that time, he also stated that rainbow trout extended well into the brook trout portion of the stream. Tatum (1968) listed the stream as having a healthy brook trout population in the headwaters. The TWRA (1969e) stream survey report also listed brook trout along with rainbow trout and brown trout (Salmo trutta) as the primary species present.

Recent stream surveys (Whitworth and Strange 1979; Bivens 1984) found an allopatric brook trout population present in the upper 3.2 km (2.0 mi) of headwater in above the falls. Rainbow trout were found only in the lower section of the stream.

Higgins Creek is an excellent brook trout stream with excellent stream conditions. Its headwater brook trout are protected by three barriers and access is limited to foot travel. This limits fishing pressure and the possible introduction of other trout species above the barriers. No management is suggested other than protection of this brook trout resource. This stream is also locally known as Little Higgins Creek.

121 Birchfield Camp Branch

Map Location: Flag Pond Quadrangle (190-SE). This stream is a tributary to Higgins Creek. Its headwaters begin on the north side of Higgins Ridge near Frozen Knob. It is located within the Cherokee Wildlife Area in Unicoi County, Tennessee.

Ownership Pattern: The entire 2.3 km (1.4 mi) of stream is on private land.

Elevation:
Mouth - 875 m (2,870 ft)
Head - 1,230 m (4,035 ft)

Aspect: Northeast

Stream Size: (Determined 24 May 1984 at the mouth, at 875 m - 2,870 ft elevation):
Width - 2.3 m (7.5 ft)
Depth - 13.0 cm (5.1 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.11 (3.8 CFS)
Water Level Conditions - normal

Percent Grade: 15.8%

Barriers: None

Water Quality: (Determined 27 June 1969 by TWRA stream survey):
pH - 6.5
Dissolved Oxygen - 7 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 17°C (63°F)

(Determined 24 May 1984 at 875 m - 2,870 ft elevation):
pH - 7.3
Total Hardness - 5 ppm
Temperature - 13°C (55°F)
Siltation - heavy

Sources of Pollution: Siltation from recent drawdown of the pond located in the headwaters. Siltation also from steep surrounding areas and roads in the headwaters.

Other Species Present:
Mayflies (Ephemeroptera)
Crayfish
Salamanders

Fish Collected: May 1984 by Bivens
Brook Trout Average Length: 146.6 mm (5.8 in)
Brook Trout Average Weight: 34.0 g (1.2 oz)
Average K Brook Trout Greater Than 100 mm: 1.08
Number of Brook Trout Greater Than 100 mm: 7
Number of Brook Trout Less Than 100 mm: 3

Stream Conditions: The stream is mostly riffle areas with some fairly nice pools. The stream bottom is composed primarily of sand, fine gravel, and rubble with larger rocks and many boulders. Some bedrock areas and cascades also occur. The overall gradient is fairly steep. Siltation is heavy from a recent pond drawdown and from steep surrounding areas, but the riffle areas are clean.

Vegetative Conditions: The streambank has approximately 95% of overstory and understory vegetation made up primarily of yellow birch (Betula alleghaniensis), maples (Acer spp.), yellow poplar (Liriodendron tulipifera), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.). About 5% of the stream around the pond in the headwaters is open.

Discussion: The TWRA (1969e) stream survey report listed brook trout along with rainbow trout (Salmo gairdneri) as the primary species present in Birchfield Camp Branch. However, Bivens (1984) found only brook trout present. Brook trout were collected up to 1,210 m (3,940 ft) elevation, just below the pond in the headwaters. Brook trout are also known to be in the pond (B.E. Wilson, personal communication). The stream has about 1.9 km (1.2 mi) of allopatric brook trout water.

This brook trout population is protected from rainbow trout encroachment by a barrier located on Higgins Creek below the mouth of Birchfield Camp Branch. Therefore, no management is suggested other than protection of the stream.

122 Coffee Ridge Creek

Map Location: Flag Pond Quadrangle (190-SE), Sams Gap Quadrangle (191-NE), and Bald Creek Quadrangle (200-NW). This stream is a tributary to Spivey Creek. Its headwaters begin on the northwest side of Big Bald near Slipper Spur. It is located in Unicoi County, Tennessee.

Ownership Pattern: The lower 6.9 km (4.3 mi) of stream is on private land and the remaining 1.3 km (0.8 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 591 m (1,940 ft)
Head - 1,600 m (5,250 ft)

Aspect: North

Stream Size: (Determined 18 May 1984 at 757 m - 2,485 ft elevation):
Width - 3.0 m (9.7 ft)

(Determined by TWRA 1969 stream survey):
Average Width - 2.1 m (7.0 ft)
Width Varies - 0.9 to 4.0 m (3.0 to 13.0 ft)
Average Pool Depth - 7.6 cm (3.0 in)
Average Riffle Depth - 7.6 cm (3.0 in)

Percent Grade: 12.3%

Barriers: Not Recorded

Water Quality: (Determined 27 June 1969 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 7 ppm
Hardness - 51 ppm
M.O. Alkalinity - 34 ppm
Temperature - 19°C (67°F)

Sources of Pollution: Not Recorded

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)

Fish Collected: 18 May 1984 by Bivens
Rainbow Trout Average Length: 162.9 mm (6.4 in)
Rainbow Trout Average Weight: 59.9 g (2.1 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.39
Number of Rainbow Trout Greater Than 100 mm: 7
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has about 80% timber, 15% pasture, and 5% cultivation. Shade or canopy is good over 80% of the stream.

Discussion: Tatum (1968) listed this stream as having brook trout. The TWRA (1969e) stream survey report also listed brook trout along with rainbow trout as the primary species present in Coffee Ridge Creek. However, Bivens (1984) found only rainbow trout present in the stream.

Much of the stream runs through open land and among private dwellings and habitat for trout may be marginal. Also, it appears to have an established rainbow trout population at present. Therefore, the stream probably has no future management potential for brook trout.

123 Watts Branch

Map Location: Chestoa Quadrangle (199-SW). This stream is a tributary to Spivey Creek. Its headwaters begin south of Laurel Ridge near Hollybush Gap in Unicoi County, Tennessee.

Ownership Pattern: From the mouth to approximately 0.2 km (0.1 mi) above the mouth is on private land. The next 0.5 km (0.3 mi) is on Forest Service land, and the remaining 3.4 km (2.1 mi) of stream is on private land.

Elevation:
Mouth - 620 m (2,035 ft)
Head - 933 m (3,060 ft)

Aspect: West

Stream Size: (Determined in July 1979 at 622 m - 2,040 ft elevation):
Width - 3.4 m (11.2 ft)
Depth - 19.8 cm (7.8 in)
Velocity - 0.3 meter per second (0.9 foot per second)
Cubic Meters Per Second - 0.16 (5.2 CFS)
Water Level Conditions - high

Percent Grade: 8.1%

Barriers: None

Water Quality: (Determined 27 June 1969 by TWRA stream survey):
pH - 6.5
Dissolved Oxygen - 7 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 17°C (63°F)

(Determined in July 1978 at 779 m - 2,555 ft elevation):
pH - 6.5
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
Alkalinity - 51 ppm
Temperature - 16°C (61°F)
Siltation - medium to heavy

(Determined in July 1979 at 622 m - 2,040 ft elevation):
pH - 7.5
Total Hardness - 16 ppm
Temperature - 16.6°C (62°F)
Siltation - slight

Sources of Pollution: Siltation from steep surrounding areas, trails, and from logging on the private section.

Other Species Present:
Rainbow trout (Salmo gairdneri)
Central stoneroller (Campostoma anomalum)
Blacknose dace (Rhinichthys atratulus)
Crayfish

Fish Collected: July 1979 by Bivens
Rainbow Trout Average Length: 110.0 mm (4.3 in)
Number of Rainbow Trout Greater Than 100 mm: 9
Number of Rainbow Trout Less Than 100 mm: 5

Stream Conditions: On the Forest Service section of the stream (near the mouth), there is an overall mixture of pools and riffles of about 50%. Riffle areas make up approximately 15% of the stream, while about 41% is made up of pools, 4% in flats, and the remaining 40% is in cascade or bedrock areas. It is mostly cascade and bedrock areas that usually terminate in wide, deep pools. The overall stream gradient is slight. The stream bottom is composed of small rubble to larger rocks and a few boulders. Lots of sand and bedrock are present. The private landowner near the mouth stated that the stream was hit hard by a flood in 1977 that washed a lot of small rock out of the stream. There is some organic debris present in pools, and siltation appears slight.

On private land above, the stream is fairly shallow with few pools. The bottom is composed primarily of sand and gravel with rubble and bedrock in a few places, and siltation is fairly heavy.

Vegetative Conditions: On Forest Service land, the streambank has approximately 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.). There is a lot of overhanging rhododendron along the stream.

On private land, there are many areas that have been logged over and are now open. But the extreme headwaters are mainly forested with lots of rhododendron.

Discussion: Tatum (1968) listed this stream as having brook trout. The TWRA (1969e) stream survey report listed brook trout as the primary species present. However, recent surveys found no brook trout present and only a few rainbow trout near the mouth. Whitworth and Strange (1979) surveyed the upper portion of the stream on private land and found no trout species present. They concluded that the stream is probably not suited to management of brook trout without extensive stream modifications. Bivens (1979) found a few rainbow trout on the lower section near the mouth of the stream. Here, the

private landowner stated that he has put rainbow trout in the stream on his property at various times over the past few years. No natural barriers exist and the rainbow trout appear to be reproducing. There is a section just above the Forest Service boundary where some cascades could possibly be modified into barriers, and brook trout, if stocked, might possibly survive. No rainbow trout were collected above this area.

124 Rocky Fork (Headwaters)

Map Location: Flag Pond Quadrangle (190-SE) and Greystone Quadrangle (190-SW). This stream is a tributary to South Indian Creek. Its headwaters begin high on Rich Mountain near Big Butt and Gravel Knob. It is located in both Unicoi County and Greene County, Tennessee.

Ownership Pattern: The entire 9.2 km (5.7 mi) of stream is on private land, most of which is within the Cherokee Wildlife Area.

Elevation:
Mouth - 640 m (2,100 ft)
Head - 1,352 m (4,435 ft)

Aspect: Southeast

Stream Size:
(Lower Section)
Average Width - 3.4 m (11.0 ft)
Width Varies - 1.5 to 6.7 m (5.0 to 22.0 ft)
Average Riffle Depth - 0.5 m (1.5 ft)

(Headwaters)
Average Width - 1.5 m (5.0 ft)
Width Varies - 0.6 to 2.4 (2.0 to 8.0 ft)
Average Pool Depth - 0.3 m (1.0 ft)
Average Riffle Depth - 5.1 cm (2.0 in)

Percent Grade: 7.8%

Barriers: 1. Falls; approximately 3.7 m (12.0 ft) vertical height; at about 829 m - 2,720 ft elevation.

Water Quality: (Determined in 1950 by Shields):
pH - 7.1
Maximum Temperature - 16°C (60°F)

(Determined 27 June 1968 by TWRA stream survey; lower section):
pH - 6.8
Dissolved Oxygen - 8 ppm
Hardness - 17 ppm
M.O. Alkalinity - 9 ppm
Temperature - 18°C (64°F)

(Determined 18 March 1970 by TWRA stream survey; headwaters):
pH - 6.8
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 9 ppm
Temperature - 8°C (46°F)

(Determined 1 August 1978 in the headwaters):
pH - 6.5
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
Alkalinity - 51 ppm
Temperature - 18°C (64°F)
Siltation - very light
Temperature Range:
1°C (34°F) in February 1979
18°C (64°F) in August 1978

Sources of Pollution: Not Recorded

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Longnose dace (Rhinichthys cataractae) - only one collected in headwaters.

Fish Collected: August 1978 by Whitworth and Strange
Brook Trout Average Length: 150.0 mm (5.9 in)
Brook Trout Average Weight: 39.0 g (1.4 oz)
Average K Brook Trout Greater Than 100 mm: 1.01
Number of Brook Trout Greater Than 100 mm: 22
Number of Brook Trout Less Than 100 mm: 6
Rainbow Trout Average Length: 212.0 mm (8.3 in)
Rainbow Trout Average Weight: 100.3 g (3.6 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.19
Number of Rainbow Trout Greater Than 100 mm: 24
Number of Rainbow Trout Less Than 100 mm: 7

Stream Conditions: In the headwaters, about 35% of the stream is estimated to be made up of pools. The stream bottom is composed mostly of small and large rubble with sand and a few boulders in places. Siltation is very light.

Vegetative Conditions: In the headwaters, the streambank has approximately 100% of overstory and understory vegetation made up of yellow poplar (Liriodendron tulipifera), American beech (Fagus grandifolia), birch (Betula spp.), and rhododendron (Rhododendron spp.).

Discussion: Shields (1950) reported that the extreme headwaters of Rocky Fork, along with Fort Davie Creek and Blockstand Creek tributaries, carried a heavy population of small brook trout. He also stated that at that time, recent logging operations in the headwaters had filled the stream bed with debris and had destroyed streambank cover in some places. But, this did not appear to affect the brook trout population adversely and cover for fish was actually increased.

Tatum (1968) listed this stream as having a healthy brook trout population. The TWRA (1969e, 1970a) stream surveys also listed brook trout along with rainbow trout as the primary species present. Recent stream surveys (Whitworth and Strange 1979) found brook trout, along with rainbow trout, still present in the stream. A sympatric brook/rainbow trout population now exists all the way to the upper reaches of the stream. They stated that Rocky Fork is an excellent brook trout stream with good habitat and water conditions and suggested that rainbow trout stocking be limited in the lower 4.0 km (2.5 mi) of the stream.

Rocky Fork has been used in recent studies of Southern Appalachian brook trout biology. Native brook trout from Rocky Fork were used by Harris et al. (1978) of Tennessee Technological University, Tennessee Cooperative Fishery Research Unit and by Stoneking et al. (1981) in genetic research of brook trout from the Southern Appalachian region. Brook trout from Rocky Fork were also used by Konopacky (1978) for age and growth analysis. The stream was also used as the study site for movement, distribution, production, and growth of a Southern Appalachian sympatric brook/rainbow trout population (Whitworth 1980; Whitworth and Strange 1983). Protection of this valuable native brook trout resource is of first importance.

125 Long Branch

Map Location: Flag Pond Quadrangle (190-SE). This stream is a tributary to Rocky Fork. Its headwaters begin on the south side of Higgins Ridge south of Wilson Knob. It is located within the Cherokee Wildlife Area in Unicoi County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on private land.

Elevation:
Mouth - 768 m (2,520 ft)
Head - 1,164 m (3,820 ft)

Aspect: South

Stream Size: (Determined 24 May 1984 at the mouth, at 768 m - 2,520 ft elevation):
Width - 2.1 m (7.0 ft)
Depth - 12.2 cm (4.8 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.07 (2.2 CFS)
Water Level Conditions - normal

Percent Grade: 18.9%

Barriers:
1. Falls; approximately 4.9 m (16.0 ft) vertical height; at about 927 m (3,040 ft) elevation.
2. Falls; approximately 2.4 m (8.0 ft) vertical height; at about 591 m (3,120 ft) elevation).

Water Quality: (Determined 24 May 1984 at 768 m - 2,520 ft elevation):
pH - 6.8
Total Hardness - 8 ppm
Temperature - 11°C (52°F)
Siltation - medium

Sources of Pollution: Some siltation from forest road.

Other Species Present:
Rainbow trout (*Salmo gairdneri*)
Mayflies (*Ephemeroptera*)
Crayfish
Salamanders

Fish Collected: 24 May 1984 by Bivens
Rainbow Trout Average Length: 172.9 mm (6.8 in)
Rainbow Trout Average Weight: 62.0 g (2.2 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.20
Number of Rainbow Trout Greater Than 100 mm: 9
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: The stream has a pool-riffle ratio of about 50%. Riffle areas make up approximately 51% of the stream, while about 29% is made up of pools, 1% in flats, and the remaining 19% is in cascades or bedrock areas. Stream gradient

is moderate in the lower portion but the upper stream becomes steeper. The lower stream has several nice pools and fairly good cover for fish. The upper stream has more bedrock and cascades. The stream bottom is composed of sand, rubble, rocks, and lots of boulders. Siltation is medium overall but heavy in edges of pools.

Vegetative Conditions: The streambank has 100% overstory and understory vegetation made up predominantly of yellow birch (Betula alleghaniensis), maples (Acer spp.), yellow poplar (Liriodendron tulipifera), witch hazel (Hamaelis virgiana), wild hydrangea (Hydrangea arborescens), flowering dogwood (Cornus flordia), and rhododendron (Rhododendron spp.). Most of the stream is fairly open.

Discussion: Tatum (1968) listed this stream as having brook trout. However, Bivens (1984) found only rainbow trout present. Rainbow trout were collected up to about 841 m (2,760 ft) elevation and no other fish were found in the headwaters. The stream is fairly small and has a well established rainbow trout population in its lower reaches. Therefore, it probably has no future potential for brook trout management other than renovation or possibly relocating brook trout from other area streams in the headwaters in above the barriers.

126 Flint Creek

Map Location: Flag Pond Quadrangle (190-SE). This stream is a tributary to Rocky Fork. Its headwaters begin just south of Snakeden Ridge in Greene County; however, most of the stream is located in Unicoi County, Tennessee.

Ownership Pattern: The entire 3.5 km (2.2 mi) of stream is on private land.

Elevation:
Mouth - 779 m (2,555 ft)
Head - 1,170 m (3,840 ft)

Aspect: Northeast

Stream Size:
Average Width - 1.8 m (6.0 ft)
Width Varies - 0.6 to 3.4 m (2.0 to 11.0 ft)
Average Pool Depth - 0.3 m (1.0 ft)
Average Riffle Depth - 10.2 cm (4.0 in)

Percent Grade: 11.1%

Barriers: 1. Man-made dam; at about 962 m (3,155 ft) elevation.

Water Quality: (Determined 27 June 1969 by TWRA stream survey):
pH - 6.5
Dissolved Oxygen - 8 ppm
Hardness - 17 ppm
M.O. Alkalinity - 9 ppm
Temperature - 17°C (63°F)

(Determined in August 1978 at 780 m - 2,560 ft elevation):
pH - 7.0
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
Alkalinity - 51 ppm
Temperature - 15°C (59°F)
Siltation - medium

Sources of Pollution: Not Recorded

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Dace (Rhinichthys spp.) - collected near the mouth.
Sculpin (Cottus spp.) - collected near the mouth.

Fish Collected: August 1978 by Whitworth and Strange
Rainbow Trout Average Length: 170.0 mm (6.7 in)
Rainbow Trout Average Weight: 51.0 g (1.8 oz)
Average K Rainbow Trout Greater Than 100 mm: 0.94
Number of Rainbow Trout Greater Than 100 mm: 21
Number of Rainbow Trout Less Than 100 mm: 17

Stream Conditions: The stream is mostly riffle areas with shallow pools and a few undercut banks. Its bottom is composed predominantly of gravel with some medium to large rubble.

Vegetative Conditions: The streambank has about 60 to 70% forest cover, and the bank vegetation is mostly open.

Discussion: Shields (1950) surveyed Flint Creek and stated that it was unsuited for trout management at that time due to logging operations. He commented, however, that as the stream healed from the effects of logging that it would furnish some trout water. His report made no comment on the presence of brook trout at that time.

This stream was listed by Tatum (1968) as having brook trout. The TWRA (1969e) stream survey report listed brook

trout along with rainbow trout as the primary species present. However, Whitworth and Strange (1979) found only rainbow trout present in the stream. They concluded that this stream would be best managed for rainbow trout due to the already well established population and the lack of any natural barriers.

127 Blockstand Creek

Map Location: Flag Pond Quadrangle (190-SE). This stream is a tributary to Rocky Fork. Its headwaters begin on the east face of Coldspring Mountain in Greene County, and the lower 0.8 km (0.5 mi) or so is in Unicoi County, Tennessee.

Ownership Pattern: The entire 3.2 km (2.0 mi) of stream is on private land.

Elevation:
Mouth - 864 m (2,835 ft)
Head - 1,317 m (4,320 ft)

Aspect: East

Stream Size:
Average Width - 1.2 m (4.0 ft)
Width Varies - 0.6 to 2.1 m (2.0 to 7.0 ft)
Average Pool Depth - 25.4 cm (10.0 in)
Average Riffle Depth - 5.1 cm (2.0 in)

Percent Grade: 14.1%

Barriers: 1. Double falls; 12.2 m (40.0 ft) vertical height; at about 927 m (3,040 ft) elevation.

Water Quality: (Determined 18 March 1970 by TWRA stream survey):
pH - 6.9
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 8°C (47°F)

(Determined in August 1978 at 994 m - 3,260 ft elevation):
pH - 7.0
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
Alkalinity - 34 ppm
Temperature - 15°C (59°F)
Siltation - very light

Sources of Pollution: Not Recorded

Other Species Present:
Rainbow trout (Salmo gairdneri)
Dace (Rhinichthys spp.) - collected near the mouth.

Fish Collected: August 1978 by Whitworth and Strange
Brook Trout Average Length: 140.0 mm (5.5 in)
Brook Trout Average Weight: 30.0 g (1.2 oz)
Average K Brook Trout Greater Than 100 mm: 1.01
Number of Brook Trout Greater Than 100 mm: 21
Number of Brook Trout Less Than 100 mm: 6
Rainbow Trout Average Length: 168.0 mm (6.6 in)
Rainbow Trout Average Weight: 51.0 g (1.8 oz)
Average K Rainbow Trout Greater Than 100 mm: 0.94
Number of Rainbow Trout Greater Than 100 mm: 11
Number of Rainbow Trout Less Than 100 mm: 5

Stream Conditions: About 40% of the stream is estimated to be made up of pools. The stream has good cover for fish that is made up of good sized pools and riffle areas. Its bottom is composed predominantly of gravel and small rubble with a few boulders.

Vegetative Conditions: The streambank has about 70 to 80% forest cover made up predominantly of tulip poplar (Liriodendron tulipifera), American beech (Fagus grandifolia), and birch (Betula spp.). The bank cover is variable but mostly rhododendron (Rhododendron spp.).

Discussion: Shields (1950) reported that Blockstand Creek carried a heavy population of small brook trout and that it was in the process of being opened up by a logging road. Tatum (1968) also listed this stream as having brook trout, however, he stated that the population was very low at that time, apparently due to erosion from logging and forest fires. But, the TWRA (1970a) stream survey report listed brook trout as the primary species present in Blockstand Creek. Whitworth and Strange (1979) also found brook trout present, and generally concluded that it is an excellent brook trout stream above the barrier. They suggested no unusual management other than protection of the stream.

One interesting note; fish from Blockstand Creek have been used in recent genetic research on brook trout of the Southern Appalachian region (Stoneking et al. 1981).

128 Broad Branch

Map Location: Flag Pond Quadrangle (190-SE). This stream is a tributary to Rocky Fork. Its headwaters begin on the south side of Wilson Knob and it is located in both Unicoi County and Greene County, Tennessee.

Ownership Pattern: The entire 1.9 km (1.2 mi) of stream is on private land.

Elevation:
Mouth - 936 m (3,070 ft)
Head - 1,292 m (4,240 ft)

Aspect: Southwest

Stream Size: Not Recorded

Percent Grade: 18.5%

Barriers: Not Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: August 1978 by Whitworth and Strange
Brook Trout Average Length: 151.1 m (6.0 in)
Brook Trout Average Weight: 52.9 g (2.0 oz)
Average K Brook Trout Greater Than 100 mm: 1.07
Number of Brook Trout Greater Than 100 mm: 5
Number of Brook Trout Less Than 100 mm: 2
Number of Rainbow Trout Greater Than 100 mm: 0
Number of Rainbow Trout Less Than 100 mm: 2

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: Tatum (1968) listed this stream as having brook trout. However, he stated that the population was very low at that time, apparently due to erosion from logging and forest fires. Whitworth and Strange (1979) found brook trout still present in Broad Barnch along with invading rainbow trout. A sympatric brook/rainbow trout population now exists for about 0.5 km (0.3 mi) above the mouth. Rainbow trout removal is suggested in order to protect this brook trout population.

129 Fort Davie Creek

Map Location: Flag Pond Quadrangle (190-SE). This stream is a tributary to Rocky Fork. Its headwaters begin on the south side of Rich Mountain in Greene County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on private land.

Elevation:
Mouth - 985 m (3,230 ft)
Head - 1,221 m (4,005 ft)

Aspect: Southeast

Stream Size:
Average Width - 1.2 m (4.0 ft)
Width Varies - 0.6 to 2.1 m (2.0 to 7.0 ft)
Average Pool Depth - 25.4 cm (10.0 in)
Average Riffle Depth - 5.1 cm (2.0 in)

Percent Grade: 11.3%

Barriers: Not Recorded

Water Quality: (Determined 18 March 1970 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 8°C (47°F)

(Determined 4 August 1978 near the mouth):
pH - 7.0
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
Alkalinity - 34 ppm
Temperature - 16°C (61°F)
Siltation - light

Sources of Pollution: Not Recorded

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: Not Recorded

Stream Conditions: About 40% of the stream is estimated to be made up of pools. The stream bottom is composed primarily of rubble, gravel, and boulders. Siltation is light.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation that provides shade or canopy.

Discussion: Shields (1950) reported that Fort Davie Creek carried a heavy population of small brook trout. Tatum (1968) listed this stream as having a healthy brook trout population. Stream surveys by TWRA (1970a) also listed brook trout as the the primary species present. Recent stream surveys (Whitworth and Strange 1979) found brook trout still present, along with invading rainbow trout. A sympatric brook/rainbow trout population now exists for about 0.5 km (0.3 mi) above the mouth. Rainbow trout removal is suggested in order to protect this brook trout resource.

130 Devil Fork

Map Location: Flag Pond Quadrangle (190-SE). This stream is a tributary to South Indian Creek. Its headwaters begin on the southwest side of Flint Mountain in Unicoi County, Tennessee.

Ownership Pattern: The entire 6.6 km (4.2 mi) of stream is on private land.

Elevation:
Mouth - 666 m (2,190 ft)
Head - 1,097 m (3,600 ft)

Aspect: Northeast

Stream Size:
Average Width - 2.7 m (9.0 ft)
Width Varies - 0.9 to 5.2 m (3.0 to 17.0 ft)
Average Pool Depth - 0.3 m (1.0 ft)
Average Riffle Depth - 10.2 cm (4.0 in)

Percent Grade: 5.7%

Barriers: None

Water Quality: (Determined in 1950 by Shields):
pH - 7.1
Maximum Temperature - 16°C (61°F)

(Determined 27 June 1969 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 8ppm
Hardness - 17 ppm

M.O. Alkalinity - 17 ppm
Temperature - 16°C (61°F)

(Determined in August 1978 at 838 m - 2,750 ft elevation):
pH - 7.5
Dissolved Oxygen - 11 ppm
Alkalinity - 85 ppm
Temperature - 22°C (72°F)
Siltation - heavy

Sources of Pollution: Open farm land.

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: August 1978 by Whitworth and Strange
Rainbow Trout Average Length: 115.0 mm (4.5 in)
Rainbow Trout Average Weight: 19.2 g (0.7 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.26
Number of Rainbow Trout Greater Than 100 mm: 2
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: The stream has adequate cover for fish made up of good sized pools. The stream bottom is composed predominantly of small to large rubble in the lower section and sand and gravel in the headwaters. Siltation is heavy.

Vegetative Conditions: Mostly open fields and farmland.

Discussion: Shields (1950) surveyed this stream and reported that it was marginal to sub-marginal trout waters. He made no comment on the presence of brook trout at that time. Tatum (1968) listed this stream as having brook trout in the headwaters. The TWRA (1969e) stream survey report listed brook trout along with rainbow trout as the primary species present. However, Whitworth and Strange (1979) found only rainbow trout present and generally concluded that the stream is unsuited for brook trout management.

131 Rice Creek

Map Location: Flag Pond Quadrangle (190-SE) and Sams Gap Quadrangle (191-NE). This stream is a tributary to South Indian Creek. Its headwaters begin on the southeast side of Divide Mountain in Unicoi County, Tennessee.

Ownership Pattern: The entire 7.9 km (4.9 mi) of stream is on private land.

Elevation:
Mouth - 695 m (2,280 ft)
Head - 1,207 m (3,960 ft)

Aspect: Northeast

Stream Size:
Average Width - 3.7 m (12.0 ft)
Width Varies - 1.2 to 7.0 m (4.0 to 23.0 ft)
Average Pool Depth - 0.5 m (1.5 ft)
Average Riffle Depth - 12.7 cm (5.0 in)

Percent Grade: 6.8%

Barriers: None

Water Quality: (Determined 27 June 1969 by TWRA stream survey):
pH - 7.2
Dissolved Oxygen - 8 ppm
Hardness - 34 ppm
M.O. Alkalinity - 34 ppm
Temperature - 24°C (75°F)

(Determined in August 1978, elevation not recorded):
pH - 7.5
Dissolved Oxygen - 10 ppm
Hardness - 85 ppm
Alkalinity - 51 ppm
Temperature - 22°C (72°F)
Siltation - medium

Sources of Pollution: Open farm land.

Other Fish Species Present: Rainbow trout (*Salmo gairdneri*)

Fish Collected: August 1978 by Whitworth and Strange
Rainbow Trout Average Length: 112.0 mm (4.4 in)
Rainbow Trout Average Weight: 17.8 g (0.6 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.25
Number of Rainbow Trout Greater Than 100 mm: 3
Number of Rainbow Trout Less Than 100 mm: 3

Stream Conditions: The bottom is composed of sand and gravel in the lower section of the stream, and small and large rubble in the upper reaches.

Vegetative Conditions: Mostly open farmland with a few hardwoods present.

Discussion: Shields (1950) surveyed this stream and reported that it was marginal to sub-marginal trout waters. He made no comment on the presence of brook trout at that time. Tatum (1968) listed this stream has having brook trout in the headwaters, however, he stated that the population was very low at that time, apparently due to erosion from logging and forest fires. The TWRA (1969e) stream survey report listed brook trout and rainbow trout as the primary species with brook trout being only in the extreme headwaters. Whitworth and Strange (1979) found that only rainbow trout range throughout the stream although in small numbers. They generally concluded that elevated water temperature, siltation, and other factors make this stream unsuitable for brook trout management.

132 Jones Branch

Map Location: Chestoa Quadrangle (199-SW). This stream is a tributary to the Nolichucky River. It lies just southwest of Johnson Rock Ridge in Unicoi County, Tennessee.

Ownership Pattern: The lower 0.3 km (0.2 mi) of stream is on private land, and the remaining 4.5 km (2.8 mi) of stream is on Forest Service land.

Elevation:
Mouth - 521 m (1,710 ft)
Head - 1,024 m (3,360 ft)

Aspect: Southwest

Stream Size: (Determined in July 1979 at the lower Forest Service boundary, 543 m - 1,780 ft elevation):
Width - 2.6 m (8.6 ft)
Depth - 13.5 cm (5.3 in)
Velocity - 0.2 meter per second (0.6 foot per second)
Cubic Meters Per Second - 0.05 (1.8 CFS)
Water Level Conditions - normal

Percent Grade: 10.4%

Barriers:
1. Near the mouth, the stream runs into the substrate.
2. Falls; 2.4 m (8.0 ft) vertical height; at about 732 m (2,400 ft) elevation.
3. Large cascades; about 61.0 m (200.0 ft) vertical height; starts at about 744 m (2,440 ft) elevation.

Water Quality: (Determined 27 June 1969 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 8 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 18°C (65°F)

(Determined in July 1979 at 543 m - 1,780 ft elevation):
pH - 6.3
Total Hardness - 5 ppm
Temperature - 16°C (60°F)
Siltation - medium

Sources of Pollution: Siltation from the Appalachian Trail which parallels the stream and from trail crossings. Also, siltation from steep surrounding areas.

Other Fish Species Present: None

Fish Collected: July 1979 by Bivens
Brook Trout Average Length: 114.9 (4.5 in)
Number of Brook Trout Greater Than 100 mm: 13
Number of Brook Trout Less Than 100 mm: 19

Stream Conditions: The stream has an overall pool-riffle ratio of avout 35%, however, the lower section is mostly riffles with a few small pools and the upper portion having a better mixture of pools and riffles. Riffle areas make up approximately 64% of the stream, while about 26% is made up of pools, 9% in flats, and the remaining 1% is in cascades or bedrock areas. The overall stream gradient is moderate. The stream bottom is composed of lots of sand with small rubble to larger rocks and many boulders. Also, there are several areas with undercut banks that provide cover for fish. There is a lot of organic debris present and siltation is medium.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), and rhododendron (Rhododendron spp.).

Discussion: Tatum's (1968) survey listed this stream as having a brook trout population. The TWRA (1969e) stream survey report listed brook trout along with rainbow trout (Salmo gairdneri) as the primary species present. However, Bivens (1979) found only brook trout present. An allopatric population exists for approximately 2.9 km (1.2 mi) of the stream. The stream disappears into the substrate near the lower Forest Service boundary and acts as a barrier to upstream movement of

fish and also as a deterent to fishing pressure (local private landowner stated that many fishermen turn around and leave when they see the lower section of the stream). This is an excellent brook trout stream with a healthy population of brook trout. Therefore, no special management is recommended at this time other than protection of the stream and its brook trout resource.

133 Doe River (Headwaters above confluence with Toms Branch)

Map Location: White Rocks Mountain Quadrangle (208-NE) and Iron Mountain Gap Quadrangle (208-NW). Doe River is a tributary to the Watauga River. Only the extreme headwaters are discussed here, and they arise on the southeast side of Iron Mountain south of Little Rock Knob. The entire stream is located within Carter County, Tennessee.

Ownership Pattern: Total length of Doe River is approximately 45.9 km (28.5 mi). The portion above the confluence with Toms Branch is 6.0 km (3.7 mi) and is on private land except that about 1.1 km (0.7 mi) borders on Forest Service land.

Elevation:
Confluence with Toms Branch - 913 m (2,995 ft)
Head - 1,291 m (4,235 ft)

Aspect: Northeast

Stream Size: (Determined 6 June 1984 at 913 m - 2,995 ft elevation):
Width - 6.1 m (20.0 ft)

(Determined 5 June 1984 at 985 m - 3,230 ft elevation):
Width - 6.1 m (20.0 ft)
Depth - 2.3 cm (7.5 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.36 (12.0 CFS)
Water Level Conditions - normal

Percent Grade: 6.3%

Barriers: None (Above Toms Branch)

Water Quality: (Determined 5 June 1984 at 985 m - 3,230 ft elevation):
pH - 7.5
Total Hardness - 14 ppm
Temperature - 16°C (60°F)
Siltation - heavy

Sources of Pollution: Siltation from various sources. Domestic rubbish.

Other Species Present:
Rainbow trout (Salmo gairdneri) - three were stocked fish
Blacknose dace (Rhinichthys atratulus)
Central stoneroller (Campostoma anomalum)
Fantail darter (Etheostoma flabellare)
Swannanoa darter (Etheostoma swannanoa)
Mayflies (Ephemeroptera)
Stoneflies (Plecoptera)
Crayfish
Salamanders
Snails

Fish Collected: June 1984 by Bivens
Brook Trout Average Length: 148.5 mm (5.8 in)
Brook Trout Average Weight: 41.4 g (1.5 oz)
Average K Brook Trout Greater Than 100 mm: 1.26
Number of Brook Trout Greater Than 100 mm: 24
Number of Brook Trout Less Than 100 mm: 6
Rainbow Trout Average Length: 295.5 mm (11.6 in)
Rainbow Trout Average Weight: 294.2 g (10.5 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.14
Number of Rainbow Trout Greater Than 100 mm: 6
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: The stream is fairly large with deep, wide riffles, and many good pools. The bottom is composed primarily of sand, fine gravel, and rubble along with rocks and many boulders. Siltation is heavy along with lots of domestic rubbish.

Vegetative Conditions: The streambank has approximately 80% overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), and other hardwoods. About 20% of the stream is open with little or no shade providing canopy. A paved road parallels most of the stream.

Discussion: The headwater of Doe River has not been previously listed as having brook trout. The TWRA (1968a) stream survey report listed brown trout (Salmo trutta), and rainbow trout as the primary fish species present. However, Bivens (1984) found brook trout along with rainbow trout throughout most of the upper stream. One large brown trout (1.8 to 2.7 kg range) was collected below the confluence with Toms Branch, but none were found in the brook trout area. Brook trout were found from about 913 m (2,995 ft) elevation up to about 1,012 m

(3,320 ft) elevation in the main stream and to about 1,036 m (3,400 ft) elevation up the right-hand tributary at Stockton Cemetary. The stream has about 0.8 km (0.5 mi) of allopatric brook trout in the headwaters (includes the above mentioned tributary) and about 1.9 km (1.2 mi) of sympatric brook/rainbow trout in the lower stream.

This stream has fairly good stream conditions and cover for fish. At present most of the stream (above confluence with Toms Branch) has a healthy brook trout population. Even in the mixed zone, rainbow trout, three of which were stocked fish, have not taken over completely. The ratio of rainbow trout to brook trout is 27% rainbow and 73% brook (from a total of all samples collected in the mixed zone). Future management strategies could possibly include a rainbow trout removal program, however, this would be a tremendous undertaking. Moving brook trout from Doe Rive to establish new populations in other area streams may also prove valuable. Protection of this brook trout resource is strongly suggested.

134 Laurel Fork (Headwaters)

Map Location: Elizabethton Quadrangle (207-SW), Watauga Dam Quadrangle (207-SE), and White Rocks Mountain Quadrangle (208-NE). This stream is a tributary to Doe River. The portion of the stream described is located in the Cherokee Wildlife Area. The entire stream is in Carter County, Tennessee.

Ownership Pattern: Total stream length is 27.5 km (17.1 mi). The lower 10.0 km (6.2 mi) of stream is on private land. The next 13.2 km (8.2 mi) of stream is on Forest Service land, and the remaining 4.3 km (2.7 mi) of headwater is on private land.

Elevation:
Mouth - 535 m (1,755 ft)
Lower Forest Service boundary - 774 m (2,540 ft)
Head - 1,085 m (3,560 ft)

Aspect: Northwest

Stream Size: (Determined in August 1979 at the lower Forest Service boundary at 774 m - 2,540 ft elevation):
Width - 12.7 m (41.7 ft)
Depth - 23.5 cm (9.4 in)
Velocity - 0.2 meter per second (0.8 foot per second)
Cubic Meters Per Second - 0.63 (20.9 CFS)
Water Level Conditions - normal

(Determined in September 1978 at the upper limits):
Width - 2.0 m (6.6 ft)

Percent Grade: 1.8% (Determined for headwaters only)

Barriers:

1. Long cascades; starts at about 829 m (2,720 ft) elevation.
2. Falls; 7.0 m (23.0 ft) vertical height; at about 902 m (2,960 ft) elevation.
3. Falls; 3.7 m (12.0 ft) vertical height; at about 930 m (3,050 ft) elevation.
4. Long cascades; about 6.1 m (20.0 ft) vertical height; starts at about 951 m (3,120 ft) elevation.

Water Quality: (Determined in 1950 by Shields):

(Lower section):
pH - 7.1
Maximum Temperature - 21°C (69°F)
(Upper section):
pH - 6.7
Maximum Temperature - 17°C (63°F)

(Determined 20 June 1968 by TWRA stream survey):
pH - 7.3
Dissolved Oxygen - 9 ppm
Hardness - 51 ppm
M.O. Alkalinity - 68 ppm
Temperature - 20°C (68°F)

(Determined in August 1979):
pH - 7.3 at 774 m (2,540 ft) elevation
pH - 7.5 at 975 m (3,200 ft) elevation
Total Hardness - 7 ppm at 774 m (2,540 ft) elevation
Total Hardness - 10 ppm at 975 m (3,200 ft) elevation
Temperature - 17°C (63°F)
Siltation - very heavy

Sources of Pollution: Siltation from road crossings and from private land surrounding the headwaters.

Other Species Present:

Brown trout (*Salmo trutta*)
Rainbow trout (*Salmo gairdneri*)
Blacknose dace (*Rhinichthys atratulus*)
Longnose dace (*Rhinichthys cataractae*)
Creek chub (*Semotilus atromaculatus*)
White sucker (*Catostomus commersoni*)
Mayfly naiads (Ephemeroptera) present and abundant
Stonefly naiads (Plecoptera) present and abundant

Fish Collected: August 1979 by Bivens
Brook Trout Average Length: 85.5 mm (3.4 in)
Number of Brook Trout Greater Than 100 mm: 0
Number of Brook Trout Less Than 100 mm: 2
Brown Trout Average Length: 141.0 mm (5.6 in)
Number of Brown Trout Greater Than 100 mm: 16
Number of Brown Trout Less Than 100 mm: 26
Rainbow Trout Average Length: 291.5 mm (11.5 in)
Number of Rainbow Trout Greater Than 100 mm: 11
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: On Forest Service land, the stream is composed primarily of riffles and flats with several cascades and bedrock areas. It has an overall mixture of pools and riffles of about 45%, and the riffle areas are deep and wide. Riffle areas make up approximately 60% of the stream, while about 13% is made up of pools, 16% in flats, and the remaining 11% is in cascades or bedrock areas. The overall stream gradient is slight. The stream bottom is composed of sand to fine gravel with small to large rubble, also, there are many large boulders in some areas. There is a lot of organic debris present and siltation is very heavy.

Stream Conditions: On Forest Service land, approximately 60% of the streambank has overstory and understory vegetation made up predominantly of birch (Betula spp.), hemlock (Tsuga canadensis), maple (Acer spp.) rhododendron (Rhododendron spp.), mountain laurel (Kalmia latifolia), and dog hobble (Leucothoe editorum). There are not many areas of the stream with overhanging vegetation, and approximately 40% of the stream is open with the upper portion of the stream being almost completely open.

Discussion: Tatum (1968) found brook trout in the headwaters of Laurel Fork, but stated that the population was very low at that time. He concluded that this was due to erosion caused by forest fires and logging. The TWRA (1968a) stream survey report listed rainbow trout, brown trout, and brook trout as the primary species present. Whitworth and Strange (1979) surveyed the upper 4.3 km (2.7 mi) of privately owned stream and judged it as unsuitable for trout management. They found no brook or rainbow trout in this portion of the stream. Bivens (1979) found no brook trout population on the Forest Service section, however, one sample section near the mouth of Wagner Branch (elevation 884 m - 2,900 ft), produced two brook trout (87 and 84 mm total length). Because Wagner Branch has a mixed population of brook and brown trout near its mouth, it is assumed that these two brook trout found in the Laurel Fork section are the result of downstream movement from

Wagner Branch and probably do not represent a distinct population from Laurel Fork.

Brown trout were found throughout the stream on Forest Service land and appeared to be natural stream reproduction or the result of stocked fingerlings. Rainbow trout were also found throughout most of the stream. All appeared to be stocked as catchables, and no y-o-y were collected. Although this stream probably has no future potential for brook trout management itself, it is still important because many of its tributaries still have brook trout populations.

135 Little Laurel Fork

Map Location: White Rocks Mountain Quadrangle (208-NE) and Watauga Dam Quadrangle (207-SE). This stream is a tributary to Laurel Fork which runs through the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The entire 3.7 km (2.3 mi) of stream is on Forest Service land.

Elevation:
Mouth - 872 m (2,860 ft)
Head - 1,109 m (3,640 ft)

Aspect: Southwest

Stream Size: (Determined in August 1979 at the mouth, 872 m - 2,860 ft elevation):
Width - 3.3 m (10.8 ft)
Depth - 11.3 cm (4.5 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.01 (3.2 CFS)
Water Level Conditions - normal

Percent Grade: 6.4%

Barriers:
1. Large cascades; about 24.4 m (80.0 ft) vertical height; starts at about 884 m (2,900 ft) elevation.
2. Falls; 3.0 m (10.0 ft) vertical height; at about 914 m (3,000 ft) elevation.

Water Quality: (Determined 20 June 1968 by TWRA stream survey):
Dissolved Oxygen - 9 ppm
Hardness - 34 ppm
M.O. Alkalinity - 34 ppm
Temperature - 18°C (65°F)

(Determined in August 1979 near the mouth):
pH - 6.7
Total Hardness - 7 ppm
Temperature - 17°C (62°F)
Siltation - medium heavy

Sources of Pollution: Siltation from the Forest Service road crossing the headwaters of the stream. Also, from adjacent private land and some from an old railroad grade that is now used as a foot trail.

Other Fish Species Present:
Brown trout (Salmo trutta)
Blacknose dace (Rhinichthys atratulus)
Creek chub (Semotilus atromaculatus)
(the above species occurred only below the barriers)

Fish Collected: August 1979 by Bivens
Brook Trout Average Length: 98.3 mm (3.9 in)
Number of Brook Trout Greater Than 100 mm: 5
Number of Brook Trout Less Than 100 mm: 14
Brown Trout Average Length: 132.1 mm (5.2 in)
Number of Brown Trout Greater Than 100 mm: 3
Number of Brown Trout Less Than 100 mm: 4

Stream Conditions: The stream has an overall good mixture of pools and riffles of about 50%, however, there are several areas with flats, cascades, and bedrock. Riffle areas make up approximately 45% of the stream, while about 15% is made up of pools, 20% in flats, and the remaining 20% is in cascades or bedrock area. The overall stream gradient is moderate. The stream bottom is composed of sand to fine gravel and gravel with small rubble to areas with many large boulders. Also, there are a few areas with undercut banks. There is a lot of organic debris present and siltation is medium heavy.

Vegetative Conditions: Approximately 96% of the streambank has overstory and understory vegetation made up predominantly of birch (Betula spp.), hemlock (Tsuga canadensis), maple (Acer spp.), rhododendron (Rhododendron spp.), mountain laurel (Kalmia latifolia), and dog hobble (Leucothoe editorum). Most of the stream has overhanging vegetation with only about 4% of the upper portion being open with little or no vegetative cover.

Disucssion: Shields (1950) in his survey of trout streams in east Tennessee described Little Laurel Fork as a good brook trout producing stream. Tatum (1968) also listed the stream as having a brook trout population, and the TWRA (1968a) stream

survey report listed brook trout along with rainbow trout (Salmo gairdneri) as the primary species present. Bivens (1979) found brook trout still present, along with a few brown trout that were found near the mouth. No rainbow trout were collected. The portion of the stream from the mouth to approximately 0.3 km (0.2 mi) above the mouth contained both brown and brook trout. At this point, a large system of cascades which run for approximately 0.2 km (0.1 mi) and attain a vertical height of approximately 24.4 m (80.0 ft), and a 3.0 m (10.0 ft) vertical falls check the upstream movement of brown trout. Above these barriers exists an allopatric brook trout population all the way into the headwaters. All efforts should be made to protect this stream so that it will remain a native brook trout stream. Brook trout from Little Laurel Fork could be used to restock Firescald Branch which no longer contains any fish.

136 Firescald Branch

Map Location: White Rocks Mountain Quadrangle (208-NE) and Watauga Dam Quadrangle (207-SE). This stream is a tributary to Little Laurel Fork which is a tributary to Laurel Fork. It is located in the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The entire 3.2 km (2.0 mi) of stream is on Forest Service land.

Elevation:
Mouth - 908 m (2,980 ft)
Head - 1,134 m (3,720 ft)

Aspect: Southwest

Stream Size: (Determined in August 1979 at the mouth, 908 m-elevation):
Width - 2.0 m (6.7 ft)
Depth - 10.3 cm (4.1 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.07 (2.2 CFS)
Water Level Conditions - normal

Percent Grade: 7.0%

Barriers: 1. Large cascades; starts at the mouth, 908 m (2,980 ft) elevation; approximately 11.6 m (38.0 ft) long; the cascade is steep and serves as a barrier to fish movement.

Water Quality: (Determined in August 1979 near the mouth):
pH - 6.7
Total Hardness - 5 ppm
Temperature - 17°C (63°F)
Siltation - medium

Sources of Pollution: Siltation from the Forest Service road crossing in the headwaters of the stream and from an adjacent foot trail.

Other Species Present:
No fish species collected.
Crayfish, salamanders, and aquatic insects abundant.

Stream Conditions: The stream is mostly small, shallow riffle areas and flats with lots of cascades and bedrock areas. It has an overall mixture of pools and riffles of about 30%. Riffle areas make up approximately 55% of the stream, while about 9% is made up of pools, 21% in flats, and the remaining 15% is in cascades or bedrock areas. The overall stream gradient is slight. Many areas of the stream split up and become very small and shallow. The stream bottom is composed of sand to very fine gravel with large and small rubble and a few boulders. Also, there are a few areas with undercut banks. There is a lot of organic debris present and siltation is medium.

Vegetative Conditions: Approximately 96% of the streambank has overstory and understory vegetation made up predominantly of birch (Betula spp.), maple (Acer spp.), rhododendron (Rhododendron spp.), mountain laurel (Kalmia latifolia), and dog hobble (Leucothoe editorum). There are many areas where rhododendron and mountain laurel overhang the stream and only about 4% of the stream is open with little or no vegetative cover.

Discussion: Tatum (1968) listed this stream as having brook trout. However, Bivens (1979) found no fish species present in the stream at all. Siltation may have been a major factor in the loss of the brook trout population.

This stream is classified as potential brook trout water. There is a barrier at the mouth of this stream that serves to restrict the upstream movement of other trout species and subsequent stocking of brook trout may prove successful with some stream improvements (mainly a reduction of siltation). It would be very easy to transport brook trout from Little Laurel Fork and stock them in Firescald Branch.

Firescald Branch was stocked with Owhi strain fingerlings about 102.0 mm (4.0 in) long in 1980 (Elsen, personal communication).

137 Leonard Branch

Map Location: White Rocks Mountain Quadrangle (208-NE). This stream is a tributary to Laurel Fork which runs through the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The entire 3.8 km (2.3 mi) of stream is on Forest Service land.

Elevation:
Mouth - 875 m (2,870 ft)
Head - 1,122 m (3,680 ft)

Aspect: Northeast

Stream Size: (Determined in August 1979 at the mouth, 875 m - 2,870 ft elevation):
Width - 2.3 m (7.5 ft)
Depth - 10.9 cm (4.3 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.07 (2.2 CFS)
Water Level Conditions - normal

Percent Grade: 6.7%

Barriers: 1. Cascades area; starts at approximately 927 m (3,040 ft) elevation and runs to approximately 945 m (3,100 ft) elevation, a change in elevation of about 18.0 m (60.0 ft); appears to serve as a barrier to fish movement.

Water Quality: (Determined in August 1979 near the mouth):
pH - 6.3
Total Hardness - 3 ppm
Temperature - 16°C (61°F)
Siltation - medium

Sources of Pollution: Siltation from an old railraod grade.

Other Fish Species Present:
Brown trout (*Salmo trutta*)
Blacknose dace (*Rhinichthys atratulus*)
Creek chub (*Semotilus atromaculatus*)
(the above species occurred only below the cascades area)

Fish Collected: August 1979 by Bivens
Brook Trout Average Length: 85.4 mm (3.4 in)
Number of Brook Trout Greater Than 100 mm: 10
Number of Brook Trout Less Than 100 mm: 47

Brown Trout Average Length: 160.1 mm (6.3 in)
Number of Brown Trout Greater Than 100 mm: 3
Number of Brown Trout Less Than 100 mm: 4

Stream Conditions: The stream has an overall good mixture of pools and riffles of about 50%. However, it is mostly riffle areas with a lot of flats. Riffle areas make up approximately 60% of the stream, while about 15% is made up of pools, 10% in flats, and the remaining 15% is in cascades or bedrock areas. The overall stream gradient is fairly moderate. There are a few areas with undercut banks and the overall cover for fish appears good. The stream bottom is composed of sand to very fine gravel with small rubble to large rubble and many boulders. There is a lot of organic debris present and siltation is medium.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), hemlock (Tsuga canadensis), maple (Acer spp.), rhododendron (Rhododendron spp.), and dog hobble (Leucothoe editorum). The stream has lots of overhanging rhododendron and it becomes quite snarled and tangled in the upper portion.

Discussion: Tatum's (1968) survey listed this stream as having a brook trout population. Bivens (1979) also found brook trout present, however, the section from the mouth of the stream to approximately 0.7 km (0.5 mi) above the mouth has a sympatric brook/brown trout population. At this point, a cascades area appears to be a barrier to brown trout movement and an allopatric brook trout population exists above the cascades area going all the way into the headwaters. No extraordinary management is suggested at this time other than protection of the stream so that it will remain a native brook trout stream.

138 Wagner Branch

Map Location: White Rocks Mountain Quadrangle (208-NE) and Watauga Dam Quadrangle (207-SE). This stream is a tributary to Laurel Fork which runs through the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The lower 2.7 km (1.7 mi) of stream is on Forest Service land, and the remaining 0.5 km (0.3 mi) of headwater is on private land.

Elevation:
Mouth - 887 m (2,910 ft)
Head - 1,128 m (3,700 ft)

Aspect: Southwest

Stream Size: (Determined in August 1979 at the mouth, 887 m - 2,870 ft elevation):
Width - 2.7 m (9.4 ft)
Depth - 7.5 cm (3.0 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.06 (1.9 CFS)
Water Level Conditions - normal

Percent Grade: 7.5%

Barriers:
1. Large cascades; starts at about 951 m (3,120 ft) elevation.
2. Falls; 9.1 m (30.0 ft) vertical height; at about 975 m (3,200 ft) elevation.
3. Falls; 5.8 m (19.0 ft) vertical height; at about 1,000 m (3,280 ft) elevation.
4. Cascades between the two falls.

Water Quality: (Determined 20 June 1968 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 9 ppm
Hardness - 34 ppm
M.O. Alkalinity - 34 ppm
Temperature - 18°C (64°F)

(Determined in August 1979 near the mouth):
pH - 6.5
Total Hardness - 4 ppm
Temperature - 16°C (61°F)
Siltation - moderate

Sources of Pollution: Siltation from steep surrounding areas and from the old railroad grade.

Other Fish Species Present:
Brown trout (*Salmo trutta*)
Blacknose dace (*Rhinichthys atratulus*)
(the above species occurred only below the barriers)

Fish Collected: August 1979 by Bivens
Brook Trout Average Length: 111.5 mm (4.4 in)
Number of Brook Trout Greater Than 100 mm: 15
Number of Brook Trout Less Than 100 mm: 14
Brown Trout Average Length: 138.5 mm (5.6 in)
Number of Brown Trout Greater Than 100 mm: 9
Number of Brown Trout Less Than 100 mm: 11

Stream Conditions: The stream has a fairly good mixture of pools and riffles of about 50%, with lots of cascades, and the upper protion has many areas of flats. Riffle areas make up approximately 56% of the stream, while about 15% is made up of pools, 19% in flats, and the remaining 10% is in cascades or bedrock areas. The overall stream gradient is moderate. There are many areas where undercut banks provide cover for fish. The stream bottom is composed of sand to very fine gravel with small rubble to large boulders. There is a lot of organic debris, old logs, and down trees present. Siltation is present but not extremely heavy.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), maple (Acer spp.), rhododendron (Rhododendron spp.), dog hobble (Leucothoe editorum), and mountain laurel (Kalmia latifolia). The entire stream is fairly well covered with overhanging rhododendron.

Discussion: Tatum (1968) listed this stream as having a brook trout population. Bivens (1979) also found brook trout present, however, the section from the mouth of the stream to approximately 0.9 km (0.6 mi) above the mouth has a sympatric brook/brown trout population. At this point, a large cascades and two waterfalls check the upstream movement of brown trout. Above these barriers exists an allopatric population of brook trout all the way to the upper Forest Service boundary. Brook trout may exist all the way into the headwaters of the stream, however, this has not been documented as the Forest Service survey checked only that portion of the stream on Forest Service land. No extraordinary management is suggested at this time other than protection of the stream and its brook trout resource.

139 Moreland Branch

Map Location: White Rocks Mountain Quadrangle (208-NE). This stream is a tributary to Laurel Fork which runs through the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The entire 2.7 km (1.7 mi) of stream is on Forest Service land.

Elevation:
Mouth - 908 m (2,980 ft)
Head - 1,158 m (3,800 ft)

Aspect: Northeast

Stream Size: (Determined in August 1979 at the mouth, 908 m - 2,980 ft elevation):
Width - 2.4 m (7.9 ft)
Depth - 10.8 cm (4.3 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.08 (2.7 CFS)
Water Level Conditions - normal

Percent Grade: 9.1%

Barriers: 1. Falls; about 9.1 m (30.0 ft) vertical height; at about 963 m (3,160 ft) elevation.

Water Quality: (Determined in August 1979 near the mouth):
pH - 6.6
Total Hardness - 3 ppm
Temperature - 16°C (60°F)
Siltation - moderate

Sources of Pollution: Siltation from steep surrounding area.

Other Fish Species Present: Creek chub (Semotilus atromaculatus)

Fish Collected: August 1979 by Bivens
Brook Trout Average Length: 84.7 (3.3 in)
Number of Brook Trout Greater Than 100 mm: 10
Number of Brook Trout Less Than 100 mm: 41

Stream Conditions: The stream has a fairly good mixture of pools and riffles (50%) with several areas where undercut banks also provide cover for fish. Riffle areas make up approximately 67% of the stream, while about 16% is made up of pools, 10% in flats, and the remaining 7% is in cascades or bedrock areas. The overall stream gradient is moderate. The stream bottom is composed of sand and fine gravel with small rubble to larger rocks and boulders. There is a lot of organic debris and old logs present in the stream. Siltation is present but not extremely heavy.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), maple (Acer spp.), hemlock (Tsuga canadensis), rhododendron (Rhododendron spp.), dog hobble (Leucothoe editorum), and witch hazel (Hamamelis virginiana). There are many areas of the stream that are snarled and tangled with overhanging rhododendron.

Discussion: Tatum's (1968) survey listed this stream as having a brook trout population. Bivens (1979) found that an allopatric brook trout population exists from the mouth of the head-

waters. There is no barrier at the mouth of this stream to restrict the upstream movement of brown or rainbow trout from Laurel Fork and it is considered that it is just a matter of time until they move into the stream. It is possible that other trout species already exist in the lower portion of the stream, however, none were collected. One natural barrier exists at approximately 0.5 km (0.3 mi) above the mouth, and the brook trout population is protected above this falls. No extraordinary management is suggested at this time other than protection of the stream and its brook trout resource.

140 White Rocks Branch (No-Name #2)

Map Location: White Rocks Mountain Quadrangle (208-NE). This stream is a tributary to Laurel Fork that has no name listed on the quadrangle map. I have listed it as White Rocks Branch in order to separate the brook trout population from that of other Laurel Fork tributaries and account for its distribution length. Its headwaters begin approximately 1.2 km (0.8 mi) just east of Moreland Gap and it enters Laurel Fork at 936 m (3,070 ft) elevation. It is located on the northeast side of White Rocks Mountain in the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The entire 1.6 km (1.0 mi) of stream is on Forest Service land.

Elevation:
Mouth - 936 m (3,070 ft)
Head - 1,100 m (3,610 ft)

Aspect: Northeast

Stream Size: Not recorded, however, overall it is a very small stream.

Percent Grade: 10.2%

Barriers: None

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: Brown trout (*Salmo trutta*)

Fish Collected: August 1979 by Bivens
Brook Trout Average Length: 86.4 mm (3.4 in)
Number of Brook Trout Greater Than 100 mm: 12
Number of Brook Trout Less Than 100 mm: 20
Brown Trout Average Length: 126.3 mm (5.0 in)
Number of Brown Trout Greater Than 100 mm: 3
Number of Brown Trout Less Than 100 mm: 3

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: Bivens (1979) found this stream to have a brook trout population. It has not been listed previously as having brook trout. A sympatric brook/brown trout population exists for approximately 0.6 km (0.4 mi) from the mouth of the stream and up the first junction to the right. An allopatric brook trout population starts at the first stream junction and goes up the main portion of the stream for approximately another 0.6 km (0.4 mi). Some management is necessary if the brook trout population is to survive as there are no natural barriers to fish movement and the brook trout population is being threatened by encroachment of brown trout from Laurel Fork. The original Forest Service report (Bivens 1979) lists this stream as No-Name #2.

141 Bunton Branch

Map Location: White Rocks Mountain Quadrangle (208-NE) and Watauga Dam Quadrangle (207-SE). This stream is a tributary to Laurel Fork which runs through the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The lower 1.6 km (1.0 mi) of stream is on Forest Service land. The next 0.8 km (0.5 mi) runs through a section of private land, and the remaining 0.8 km (0.5 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 957 m (3,140 ft)
Head - 1,093 m (3,585 ft)

Aspect: Southwest

Stream Size: (Determined in August 1979 at the mouth, 957 m - 3,140 ft elevation):
Width - 1.8 m (5.8 ft)
Depth - 8.3 cm (3.3 in)

Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.04 (1.3 CFS)
Water Level Conditions - normal

Percent Grade: 4.2%

Barriers: None in the lower section of the stream.

Water Quality: (Determined in August 1979 near the mouth):
pH - 6.9
Total Hardness - 5 ppm
Temperature - 15°C (59°F)
Siltation - medium

Sources of Pollution: Some siltation from an old railroad grade that is now used as a foot trail. Also, there is a pond on private land in the headwaters of the stream that may cause some problems.

Other Fish Species Present:
Brown trout (Salmo trutta)
Blacknose dace (Rhinichthys atratulus)
Creek chub (Semotilus atromaculatus)

Fish Collected: August 1979 by Bivens
Brown Trout Average Length: 69.4 mm (2.7 in)
Number of Brown Trout Greater Than 100 mm: 0
Number of Brown Trout Less Than 100 mm: 5

Stream Conditions: The stream has an overall mixture of pools and riffles of about 30%, however, it is mostly riffle areas with a few pools. Riffle areas make up approximately 67% of the stream, while about 13% is made up of pools, 16% in flats, and the remaining 4% is in cascades or bedrock areas. The overall stream gradient is slight. There are many areas where undercut banks provide cover for fish. The stream bottom is composed of sand to very fine gravel with small rubble to larger rubble and a few boulders in the upper portion of the stream. There is a lot of organic debris present and siltation is medium.

Vegetative Conditions: Approximately 90% of the streambank has overstory and understory vegetation made up predominantly of birch (Betula spp.), hemlock (Tsuga canadensis), maple (Acer spp.), rhododendron (Rhododendron spp.), and dog hobble (Leucothoe editorum). There are several areas of the stream with overhanging vegetation and the upper part of the stream becomes so snarled and tangled with rhododendron that it is almost impassable. Only about 10% of the stream is open with

little or no shade providing vegetation.

Discussion: Tatum (1968) listed this stream as having brook trout. However, Bivens (1979) found no brook trout present. He found only a few brown trout in the lower section of the stream from the mouth to approximately 0.3 km (0.2 mi) above the mouth. Stream siltation may have been a major contributor to the loss of the brook trout population.

This stream is classified as potential brook trout water. However, there are no natural barriers to fish movement and siltation is a major problem. Therefore, subsequent stocking of brook trout depends directly on stream improvements.

142 Cook Branch

Map Location: White Rocks Mountain Quadrangle (208-NE) and Watauga Dam Quadrangle (207-SE). This stream is a tributary to Laurel Fork which runs through the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The lower 1.6 km (1.0 mi) of stream is on Forest Service land, and the remaining 1.6 km (1.0 mi) of headwater is on private land.

Elevation:
Mouth - 965 m (3,165 ft)
Head - 1,084 m (3,555 ft)

Aspect: Southwest

Stream Size: (Determined in August 1979 at the mouth, 965 m - 3,165 ft elevation):
Width - 2.0 m (6.5 ft)
Depth - 9.7 cm (3.8 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meter Per Second - 0.06 (2.0 CFS)
Water Level Conditions - normal

Percent Grade: 3.7%

Barriers: None on Forest Service land.

Water Quality: (Determined in August 1979 near the mouth):
pH - 7.3
Total Hardness - 7 ppm
Temperature - 10°C (51°F)
Siltation - medium

Sources of Pollution: Some siltation from an old railroad grade that is now used as a foot trail. Siltation from private land surrounding the headwaters, and probably some siltation from recent logging activity in the general area surrounding the stream.

Other Fish Species Present:
Brown trout (Salmo trutta)
Creek chub (Semotilus atromaculatus)

Fish Collected: August 1979 by Bivens
Brook Trout Average Length: 98.2 mm (3.9 in)
Number of Brook Trout Greater Than 100 mm: 8
Number of Brook Trout Less Than 100 mm: 14
Brown Trout Average Length: 129.3 mm (5.1 in)
Number of Brown Trout Greater Than 100 mm: 11
Number of Brown Trout Less Than 100 mm: 10

Stream Conditions: The stream has an overall fair mixture of pools and riffles that is about 40%. However, it is mostly shallow, narrow riffle areas with small pools. Riffle areas make up approximately 54% of the stream, while about 22% is made up up of pools, 12% in flats, and the remaining 12% is in cascades or bedrock areas. The overall stream gradient is slight. There are many areas with undercut banks and areas where old timbers from old railroad crossings provide cover for fish. The stream bottom is composed mainly of sand and very fine gravel with some small rubble to larger rubble and a few boulders. There is a lot of organic debris present and siltation is medium.

Vegetative Conditions: Approximately 90% of the streambank has overstory and understory vegetation made up predominantly of birch (Betula spp.), maple (Acer spp.), hemlock (Tsuga canadensis), rhododendron (Rhododendron spp.), and dog hobble (Leucothoe editorum). The stream for most of its length is snarled and tangled with rhododendron and other debris, and only about 10% of the stream is open with little or no shade providing vegetation.

Discussion: Tatum's (1968) survey listed this stream as having a brook trout population. Bivens (1979) also found brook trout present, however, the section of the stream on Forest Service land was found to have a sympatric brook/brown trout population. Brook trout may exist all the way into the headwaters of the stream, but this has not been documented as the Forest Service survey checked only that portion of the stream on Forest Service land. No natural barriers were found on the

Forest Service portion of the stream and some extraordinary management practices may be necessary if the brook trout population is to survive.

143 Camp Fifteen Branch

Map Location: White Rocks Mountain Quadrangle (208-NE). This stream is a tributary to Laurel Fork and has no name listed on the quadrangle map. The name Camp Fifteen Branch was taken from a sign on a tree located near the mouth of the stream. Its headwaters begin on the northeast side of White Rocks Mountain and it enters Laurel Fork at approximately 971 m (3,185 ft) elevation. It is located in the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The entire 2.3 km (1.4 mi) of stream is on Forest Service land.

Elevation:
Mouth - 971 m (3,185 ft)
Head - 1,082 m (3,550 ft)

Aspect: Northeast

Stream Size: Not recorded, however, at the mouth it does not average much over 1.2 m (4.0 ft) in width.

Percent Grade: 4.9%

Barriers: None

Water Quality: (Determined in August 1979) near the mouth):
pH - 7.3
Total Hardness - 5 ppm
Temperature - 14°C (57°F)
Siltation - moderately heavy

Sources of Pollution: Not Recorded

Other Fish Species Present:
Brown trout (*Salmo trutta*)
Creek chub (*Semotilus atromaculatus*)
Blacknose dace (*Rhinichthys atratulus*)

Fish Collected: August 1979 by Bivens
Brook Trout Average Length: 94.5 mm (3.7 in)
Number of Brook Trout Greater Than 100 mm: 16
Number of Brook Trout Less Than 100 mm: 32

Brown Trout Average Length: 114.4 mm (4.5 in)
Number of Brown Trout Greater Than 100 mm: 7
Number of Brown Trout Less Than 100 mm: 14

Stream Conditions: The stream is mostly shallow, narrow riffle areas, however, there are several areas where there is a good mixture of pools and riffles. Also, there are many areas where undercut banks provide cover of fish and many of the fish collected were found in such areas.

Vegetative Conditions: Not recorded, however, some areas of the stream are snarled and tangled with rhododendron (Rhododendron spp.), especially in the upper portion of the stream.

Discussion: Bivens (1979) found this stream to have a brook trout population. It has not been listed previously as having brook trout. A sympatric brook/brown trout population exists from the mouth of the stream to approximately 0.8 km (0.5 mi) above the mouth. From this point, an allopatric brook trout population exists for the next 0.6 km (0.4 mi). Some management is necessary if the brook trout population is to survive. There are no natural barriers to fish movement and the brook trout population is being threatened by encroachment of brown trout from Laurel Fork.

A barrier should be constructed near the mouth of this stream and an intensive effort made to remove brown trout from the stream and transport them to Laurel Fork below the barrier. Or, if this is not feasible, a barrier could be built at the upper limit of brown trout to prevent their future movement into pure brook trout water. The brook trout population in this stream has extremely pretty colors. It is important that this stream and its brook trout population be protected.

144 Bitter End Branch (No-Name #1)

Map Location: White Rocks Mountain Quadrangle (208-NE). This stream is a tributary to Laurel Fork that has no name listed on the quadrangle map. I have listed it as Bitter End Branch in order to separate the brook trout population from that of other Laurel Fork tributaries and account for its distribution length. Its headwaters begin on the northeast side of White Rocks Mountain and it enters Laurel Fork at 972 m (3,190 ft) elevation. It is located in the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The total stream length is 1.3 km (0.8 mi). The lower 0.4 km (0.3 mi) of the stream is on Forest Service land. The next 0.2 km (0.1 mi) runs through a section of private land and then back on to Forest Service land for another 0.4 km (0.2 mi). The remaining 0.4 km (0.2 mi) of headwater is on private land.

Elevation:
Mouth - 972 m (3,190 ft)
Head - 1,059 m (3,475 ft)

Aspect: North

Stream Size: Not recorded, however, at the mouth it does not average much over 1.2 m (4.0 ft) in width.

Percent Grade: 6.7%

Barriers: Not Recorded

Water Quality: Not Recorded

Sources of Pollution: Road construction may have disturbed this stream.

Other Fish Species Present: Brown trout (*Salmo trutta*)

Fish Collected: August 1979 by Bivens
Number of Brook Trout Greater Than 100 mm: 1
Number of Brook Trout Less Than 100 mm: 1
Only One Brown Trout Collected: 76.0 mm (3.0 in)

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: Bivens (1979) found brook trout present in this stream. However, only two brook trout were collected in a 76.0 m (250.0 ft) section near the mouth of the stream. This was the only section of the stream checked and although two fish do not represent a distinct population, brook trout may exist on into the headwaters and future investigations are needed. Construction of a road across the stream within the past few years may have disturbed the trout population. The stream has not been listed by any previous worker as having brook trout. The original Forest Service report (Bivens 1979) lists this stream as No-Name #1.

145 Camp Ten Branch (Bear Pen Branch)

Map Location: White Rocks Mountain Quadrangle (208-NE). This stream is a tributary to Laurel Fork which runs through the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The entire 1.9 km (1.2 mi) of stream is on Forest Service land.

Elevation:
Mouth - 974 m (3,195 ft)
Head - 1,046 m (3,435 ft)

Aspect: Southwest

Stream Size: (Determined in August 1979 at the mouth, 974 m - 3,195 ft elevation):
Width - 1.5 m (4.8 ft)
Depth - 6.1 cm (2.4 in)
Velocity - 0.2 meter per second (0.6 foot per second)
Cubic Meters Per Second - 0.02 (0.5 CFS)
Water Level Conditions - normal

Percent Grade: 3.8%

Barriers: None

Water Quality: (Determined in August 1979 near the mouth):
pH - 7.3
Total Hardness - 5 ppm
Temperature - 14°C (58°F)
Siltation - medium heavy

Sources of Pollution: Siltation from forest road that runs nearby, and crosses the stream in the headwaters. Some siltation from an old railroad grade that is now used as a foot trail.

Other Fish Species Present:
Brown trout (*Salmo trutta*)
Blacknose dace (*Rhinichthys atratulus*)
Creek chub (*Semotilus atromaculatus*)

Fish Collected: August 1979 by Bivens
Brook Trout Average Length: 92.4 mm (3.6 in)
Number of Brook Trout Greater Than 100 mm: 9
Number of Brook Trout Less Than 100 mm: 20
Brown Trout Average Length: 106.3 mm (4.2 in)
Number of Brown Trout Greater Than 100 mm: 1
Number of Brown Trout Less Than 100 mm: 2

Stream Conditions: The stream has an overall mixture of pools and riffles of about 35%, however, it is mostly shallow, narrow riffles with very few pools and several flats. Riffle areas make up approximately 59% of the stream, while about 12% is made up of pools, 24% in flats, and the remaining 5% is in cascades or bedrock areas. The overall stream gradient is slight. There are many areas where undercut banks and old logs provide cover for fish and many of the fish collected were found in such areas. There are several areas where the stream splits up and becomes very shallow and swampy. The stream bottom is composed mostly of fine gravel to small rubble with a sandy bottom, and not very many large rocks are present. Siltation is medium heavy and organic debris is present.

Vegetative Conditions: Approximately 67% of the streambank has overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), birch (Betula spp.), maple (Acer spp.), rhododendron (Rhododendron spp.), mountain laurel (Kalmia latifolia), and dog hobble (Leucothoe editorum). There are lots of areas with overhanging rhododendron interspersed with several open areas and the upper portion of the stream becomes so snarled and tangled with rhododendron that it is almost impassable. About 33% of the stream is open with little or no shade providing vegetation.

Discussion: Tatum (1968) listed this stream as having brook trout, however, on his list the stream is called Bar Pen Branch. Bivens (1979) found an allopatric brook trout population to be present all the way into the headwaters of the stream, but the lower section near the mouth had no brook trout and three brown trout were collected. There are no barriers near the mouth to prevent brown trout from moving into the stream from Laurel Fork and some management may be necessary if the brook trout population is to survive.

146 Hays Branch (Cherry Flats Branch)

Map Location: White Rocks Mountain Quadrangle (208-NE). This stream is a tributary to Laurel Fork which runs through the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The entire 1.6 km (1.0 mi) of stream is on Forest Service land.

Elevation:
Mouth - 988 m (3,240 ft)
Head - 1,038 m (3,405 ft)

Aspect: Southwest

Stream Size: (Determined in August 1979 at the mouth, 988 m - 3,240 ft ft elevation):
Width - 1.5 m (4.9 ft)
Depth - 7.4cm (2.9 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.03 (1.1 CFS)
Water Level Conditions - normal

Percent Grade: 3.1%

Barriers: None

Water Quality: (Determined in August 1979 at the mouth, 988 m - 3,240 ft elevation):
pH - 6.7
Total Hardness - 5 ppm
Temperature - 15 C (59 F)
Siltation - medium

Sources of Pollution: Siltation from road crossings.

Other Fish Species Present:
Blacknose dace (Rhinichthys atratulus)
Creek chub (Semotilus atromaculatus)

Stream Conditions: The stream has an overall mixture of pools and riffles of about 30%, however, it is mostly shallow, narrow riffle areas. Riffle areas make up approximately 33% of the stream, while about 15% is made up of pools, 26% in flats, and the remaining 26% is in cascades or bedrock areas. The overall gradient is slight. There are lots of old logs and limbs that provide cover for fish but only a few areas with undercut banks. There are several areas where the stream is shallow and swampy, one such area is near the mouth where the remains of an old beaver dam form a small, swampy pond. The stream bottom is composed of fine gravel to small rubble with some larger rubble and a sandy bottom with only a few larger rocks. Siltation is medium heavy and organic debris is present.

Vegetative Conditions: Approximately 80% of the streambank has overstory and understory vegetation made up predominantly

of hemlock (Tsuga canadensis), birch (Betula spp.), rhododendron (Rhododendron spp.), mountain laurel (Kalmia latifolia), and dog hobble (Leucothoe editorum). It has a fairly open understory and about 20% of the stream is open with little or no shade providing vegetation.

Discussion: On Tatum's (1968) list, this stream is called Cherry Flats Branch. He listed the stream as apparently having a healthy brook trout population at that time. However, Bivens (1979) found no brook trout or other trout species present. Stream siltation may have been a major contributor to the loss of the brook trout population.

This stream is classified as potential brook trout water. With some stream improvements, especially a reduction of siltation, stocking of brook trout may prove successful.

Hays Branch was stocked with Owhi strain fingerlings about 102.0 mm (4.0 in) long in 1980 (Elsen, personal communication).

147 Clarke Creek (Headwaters)

Map Location: Iron Mountain Gap Quadrangle (208-NW). This stream is a tributary to Sally Cove Creek, which is a tributary to Simerly Creek. It is located on the north side of Clarke Mountain in Carter County, Tennessee.

Ownership Pattern: The lower 1.0 km (0.6 mi) of stream is on private land, and the next 1.8 km (1.1 mi) is on Forest Service land. The remaining 2.3 km (1.4 mi) of headwater is on private land.

Elevation:
Mouth - 765 m (2,510 ft)
Head - 1,134 m (3,720 ft)

Aspect: North

Stream Size: (Determined in September 1979 at 780 m - 2,560 ft elevation):
Width - 2.9 m (9.6 ft)
Depth - 12.4 cm (4.9 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.14 (4.7 CFS)
Water Level Conditions - high

Percent Grade: 9.2%

Barriers:

1. Cascades; starts at about 939 m (3,080 ft) elevation.
2. Falls; 5.5 m (18.0 ft) vertical height; at about 963 m (3,160 ft) elevation.
3. Falls; 3.0 m (10.0 ft) vertical height; at about 975 m (3,200 ft) elevation.

Water Quality: (Determined in June 1979 at 780 m - 2,560 ft elevation):
pH - 7.5
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
Alkalinity - 34 ppm
Temperature - 17°C (63°F)
Siltation - heavy

(Determined in September 1979 at 780 m - 2,560 ft elevation):
pH - 7.5
Total Hardness - 10 ppm
Temperature - 16°C (61°F)
Siltation - heavy

Sources of Pollution: Minnow rearing pool area which has been extensively cleared.

Other Species Present:
Rainbow trout (*Salmo gairdneri*)
Blacknose dace (*Rhinichthys atratulus*)
Fathead minnow (*Pimephales promelas*)
Ephemeroptera
Crayfish
Salamanders

Fish Collected: June 1979 by Whitworth and Strange
Brook Trout Average Length: 152.0 mm (6.0 in)
Brook Trout Average Weight: 45.6 g (1.6 oz)
Average K Brook Trout Greater Than 100 mm: 1.22
Number of Brook Trout Greater Than 100 mm: 7
Number of Brook Trout Less Than 100 mm: 6

September 1979 by Bivens
Rainbow Trout Average Length: 96.0 mm (3.8 in)
Number of Rainbow Trout Greater Than 100 mm: 5
Number of Rainbow Trout Less Than 100 mm: 7

4 June 1984 by Bivens
Brook Trout Average Length: 119.0 mm (4.7 in)
Brook Trout Average Weight: 17.0 g (0.6 oz)
Average K Brook Trout Greater Than 100 mm: 1.00
Number of Brook Trout Greater Than 100 mm: 3
Number of Brook Trout Less Than 100 mm: 2

Stream Conditions: On the Forest Service section of the stream, there is an overall mixture of pools and riffles of about 35%. Riffle areas make up approximately 58% of the stream, while about 11% is made up of pools, 5% in flats, and the remaining 26% is in cascade or bedrock areas. It is mostly riffle and cascades with a few pools. The pools are full of sand and organic debris, and siltation is heavy. The overall stream gradient is fairly moderate. The stream bottom is composed of sand and fine gravel to small and large rubble with some larger rocks and boulders.

On private land, the stream is composed of sand and fine gravel with some rubble and rocks. Siltation is heavy in the lower section but is fairly light in the headwaters of the stream, and riffle areas are clean. It is mostly shallow areas of riffles with very few, small, shallow pools. The stream is low gradient in the headwaters.

Vegetative Conditions: On Forest Service land, the streambank has approximately 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), maple (Acer spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.). The streambank has lots of overhanging rhododendron. On private land, bank cover is variable and forest cover is about 90%.

Discussion: Tatum (1969) listed this stream as having brook trout in the headwaters. Whitworth and Strange (1979) also found brook trout present in the headwaters. They documented brook trout at 1,030 m (3,380 ft) elevation, just below the minnow rearing pools, and at 1,054 m (3,460 ft) elevation, just above the minnow rearing pools. Bivens (1984) found brook trout up to 1,109 m (3,640 ft) elevation. The stream has approximately 1.6 km (1.0 mi) of allopatric brook trout water.

Bivens (1979) found no brook trout present on the Forest Service section of the stream. A few rainbow trout were found near the lower Forest Service boundary line below the barriers. The Forest Service checked the Forest Service section of the stream again in 1982 and confirmed that no brook trout were present within that section of the stream (Elsen, personal communication). No trout management is suggested for the section below the minnow pools until the construction ceases and the stream begins to heal. Protection of the stream above the minnow rearing pools is necessary as there appears to be a healthy population of brook trout present.

148 Tiger Creek

Map Location: Iron Mountain Gap Quadrangle (208-NW). This stream is a tributary to Little Doe River. Its headwaters begin on the north side of Iron Mountain near Little Rock Knob in Carter County, Tennessee.

Ownership Pattern: The total stream length is about 11.4 km (7.1 mi). Only about 2.4 km (1.5 mi) of headwater stream is on Forest Service land.

Elevation:
Mouth - 611 m (2,005 ft)
Head - 1,253 m (4,110 ft)

Aspect: Northwest

Stream Size: (Determined at 841 m - 2,758 ft elevation):
Width - 5.2 m (17.0 ft)
Depth - 16.8 cm (6.6 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.34 (11.2 CFS)
Water Level Conditions - normal

Percent Grade: 5.6%

Barriers: None found (entire stream was not checked)

Water Quality: (Determined 20 June 1968 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 17°C (63°F)

(Determined 4 June 1984 at 841 m - 2,758 ft elevation):
pH - 7.5
Total Hardness - 11 ppm
Temperature - 14°C (57°F)
Siltation - medium to heavy

Sources of Pollution: Siltation from agricultural practices and various other sources. Domestic rubbish.

Other Species Present:
Rainbow trout (*Salmo gairdneri*)
Blacknose dace (*Rhinichthys atratulus*)
Longnose dace (*Rhinichthys cataractae*)

Ephemeroptera
Plecoptera
Crayfish
Salamanders
Snails

Fish Collected: September 1979 by Bivens
Brook Trout Average Length: 80.3 mm (3.2 in). Based on fish less than 100 mm.
Number of Brook Trout Greater Than 100 mm: 0
Number of Brook Trout Less Than 100 mm: 8

May and June 1984 by Bivens
Brook Trout Average Length: 141.4 mm (5.6 in)
Brook Trout Average Weight: 32.8 g (1.2 oz)
Average K Brook Trout Greater Than 100 mm: 1.16
Number of Brook Trout Greater Than 100 mm: 24
Number of Brook Trout Less Than 100 mm: 8
Rainbow Trout Average Length: 177.4 mm (7.0 in)
Rainbow Trout Average Weight: 70.2 g (2.5 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.26
Number of Rainbow Trout Greater Than 100 mm: 25
Number of Rainbow Trout Less than 100 mm: 0

Stream Conditions: Cover for fish is good to excellent. The stream has many large, deep pools and abundant riffle areas that are deep and wide. The stream bottom is composed primarily of sand, fine gravel, and rubble with many rocks and large boulders. Some bedrock areas also occur. Overall, the stream is low gradient. Siltation is medium to heavy, but riffles and spawning areas are very clean. Domestic rubbish is prevalent throughout much of the stream.

Vegetative Conditions: The local watershed is about 80% timber, 15% pasture, and 5% cultivation. The streambank probably has about 50% overstory vegetation at best. However, much of it does have some shade providing understory, probably about 85%. Primary species include yellow poplar (Liriodendron tulipifera), maples (Acer spp.), sycamore (Platanus occidentalis), hemlock (Tsuga canadensis), yellow birch (Betula alleghaniensis), yellow buckeye (Aesculus octandra), black willow (Salix nigra), and rhododendron (Rhododendron spp.).

Discussion: Tiger Creek has not been previously listed as having brook trout. The TWRA (1968a) stream survey report listed rainbow trout and brown trout (Salmo trutta) as the primary species present. However, Bivens (1979, 1984) found no brook

trout throughout most of the stream. No brown trout were collected. Brook trout were found from about 695 m (2,280 ft) elevation up to about 1,134 m (3,720 ft) elevation. The stream has about 1.4 km (0.9 mi) of allopatric brook trout in the headwaters and about 7.2 km (4.5 mi) of sympatric brook/rainbow trout in the lower stream. This includes one upstream, unnamed tributary that enters Tiger Creek at 1,018 m (3,340 ft) elevation. Tiger Creek has the longest brook trout distribution (total of about 8.7 km - 5.4 mi) of any known stream in east Tennessee.

This stream has fairly good stream conditions and cover for fish. At present, most of the stream has a healthy brook trout population. Even in the mixed zone, rainbow trout have not completely taken over yet. The ratio of rainbow trout to brook trout is 53% rainbow and 47% brook (from a total of all samples collected in the mixed zone). Future management strategies could possibly include a rainbow trout removal program. This would be a tremendous undertaking but it may be well worth the effort as rainbow trout are also threatening 3 to 4 tributary streams that have good brook trout populations. Moving brook trout from Tiger Creek to establish new populations in other area streams may also prove valuable. Protection of this brook trout resource is strongly suggested.

149 Roberts Hollow

Map Location: Iron Mountain Gap Quadrangle (208-NW). This stream is a tributary to Tiger Creek. Its headwaters begin on the south side of Clarke Mountain. It has no name on the quadrangle map and Roberts Hollow is a local name. The stream enters Tiger Creek at 928 m (3,045 ft) elevation and is in Carter County, Tennessee.

Ownership Pattern: The lower 1.0 km (0.8 mi) of stream is on private land, and the remaining 1.4 km (0.9 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 928 m (3,045 ft)
Head - 1,164 m (3,820 ft)

Aspect: Northeast

Stream Size: (Determined at the mouth, 928 m - 3,045 ft elevation):
Width - 2.2 m (7.3 ft)
Depth - 10.2 cm (4.0 in)

Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.07 (2.3 CFS)
Water Level Conditions - normal

Percent Grade: 9.8%

Barriers: None Recorded

Water Quality: (Determined 1 June 1984 at 928 m - 3,045 ft elevation):
pH - 7.5
Total Hardness - 13 ppm
Temperature - 12°C (54°F)
Siltation - medium

Sources of Pollution: Siltation from gravel road. Domestic rubbish in the lower stream.

Other Species Present:
Blacknose dace (Rhinichthys atratulus)
Ephemeroptera
Crayfish
Salamanders

Fish Collected: 1 June 1984 by Bivens
Brook Trout Average Length: 140.3 mm (5.0 in)
Brook Trout Average Weight: 32.4 g (1.2 oz)
Average K Brook Trout Greater Than 100 mm: 1.17
Number of Brook Trout Less Than 100 mm: 7
Number of Brook Trout Less Than 100 mm: 3

Stream Conditions: The stream has a fairly good mixture of pools and riffles, and the bottom is composed primarily of sand, fine gravel, and rubble with rocks and boulders. Siltation is light in riffles but heavy in side pools. Domestic rubbish is prevalent in the lower stream near the mouth.

Vegetative Conditions: The stream has about 60% forest cover with the lower 40% of the stream being open. Primary species include yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), maples (Acer spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.).

Discussion: This stream has not been documented previously as having brook trout. Dean Elsen (personal communication) found brook trout on the Forest Service section of the stream. Bivens (1984) surveyed the lower portion on private land and Brook trout were found from the mouth up to about 1,109 m

(3,640 ft) elevation and the stream has about 1.9 km (1.2 mi) of allopatric brook trout water.

This stream has a good, healthy population of wild brook trout, but it may have future problems of rainbow trout encroachment from Tiger Creek. No known natural barriers exist and rainbow trout may soon invade. Management should be directed at protection of this brook trout resource.

150 Bill Creek

Map Location: Iron Mountain Gap Quadrangle (208-NW). This stream is a tributary to Tiger Creek. Its headwaters begin on the north side of Iron Mountain southeast of Clarke Mountain in Carter County, Tennessee.

Ownership Pattern: The entire 2.4 km (1.5 mi) of stream is on Forest Service land.

Elevation:
Mouth - 963 m (3,160 ft)
Head - 1,183 m (3,880 ft)

Aspect: Northeast

Stream Size: (Determined at the mouth, 963 m - 3,160 ft elevation):
Width - 2.5 m (8.3 ft)
Depth - 11.7 cm (4.6 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.11 (3.8 CFS)
Water Level Conditions - normal

Percent Grade: 9.1%

Barriers: None

Water Quality: (Determined 25 May 1984 at 963 m - 3,160 ft elevation):
pH - 7.3
Total Hardness - 7 ppm
Temperature - 12°C (54°F)
Siltation - medium

Sources of Pollution - Some siltation from old road and trail crossings.

Other Species Present:
Rainbow trout (*Salmo gairdneri*)
Blacknose dace (*Rhinichthys atratulus*)

Mayflies (Ephemeroptera)
Crayfish
Salamanders
Snails

Fish Collected: September 1979 by Bivens
Brook Trout Average Length: 80.7 (3.2 in)
Number of Brook Trout Greater Than 100 mm: 0
Number of Brook Trout Less Than 100 mm: 13

25 May 1984 by Bivens
Brook Trout Average Length: 125.4 mm (4.9 in)
Brook Trout Average Weight: 23.0 g (0.8 oz)
Average K Brook Trout Greater Than 100 mm: 1.17
Number of Brook Trout Greater Than 100 mm: 26
Number of Brook Trout Less Than 100 mm: 5
Rainbow Trout Average Length: 141.5 mm (5.6 in)
Rainbow Trout Average Weight: 35.5 g (1.3 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.25
Number of Rainbow Trout Greater Than 100 mm: 2
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: The stream has an overall pool-riffle ratio of about 35%. Riffle areas make up approximately 75% of the stream, while about 15% is made up of pools, no flats, and the remaining 10% is in cascades or bedrock areas. The stream is fairly low gradient. Its bottom is composed of lots of sand and fine gravel with large and small rubble. Not very many pools occur and there are several cascades. Riffle areas are deep and wide and undercut banks and old logs help to create pools and cover areas for fish. Siltation appears heavy around edges of pools, but riffle areas are very clean.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), yellow buckeye (Aesculus octandra), maples (Acer spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.). The stream is fairly open with more rhododendron occurring in the upper reaches.

Discussion: Bivens (1979, 1984) found brook trout present in this stream. It has not been previously listed as a brook trout stream. Brook trout were found up to about 1,109 m (3,640 ft) elevation. The stream has approximately 2.1 km (1.3 mi) of allopatric brook trout water and about 0.2 km (0.1 mi) of sympatric brook/rainbow trout near the mouth. There are no natural barriers and rainbow trout from Tiger Creek are beginning to invade the stream. No rainbow trout present when the stream was first checked in 1979.

At present time, Bill Creek has a healthy population of brook trout, with good stream conditions and cover for fish. Protection of this resource should be of first importance. Therefore, future management should be directed at barrier construction and rainbow trout removal.

151 Fall Branch

Map Location: Iron Mountain Gap Quadrangle (208-NW). This stream is a tributary to Tiger Creek. Its headwaters begin on the north side of Iron Mountain southeast of Clarke Mountain in Carter County, Tennessee.

Ownership Pattern: The entire 2.3 km (1.4 mi) of stream is on Forest Service land.

Elevation:
Mouth - 974 m (3,195 ft)
Head - 1,195 m (3,920 ft)

Aspect: Northeast

Stream Size: (Determined at the mouth, 974 m - 3,195 ft elevation):
Width - 2.2 m (7.3 ft)
Depth - 12.4 cm (4.9 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.11 (3.6 CFS)
Water Level Conditions - slightly high

Barriers: 1. Falls; approximately 4.6 m (15.0 ft) vertical height; at about 1,061 m (3,480 ft) elevation.

Water Quality: (Determined 31 May 1984 at 974 m - 3,195 ft elevation):
pH - 7.3
Total Hardness - 8 ppm
Temperature - 8°C (46°F)
Siltation - medium

Sources of Pollution: Siltation from old logging road and steep surrounding areas.

Other Species Present:
Mayflies (Ephemeroptera)
Stoneflies (Plecoptera)
Odonata

Crayfish
Salamanders

Fish Collected: September 1979 by Bivens
Brook Trout Average Length: 123.0 mm (4.8 in)
Number of Brook Trout Greater Than 100 mm: 2
Number of Brook Trout Less Than 100 mm: 11

31 May 1984 by Bivens
Brook Trout Average Length: 115.6 mm (4.6 in)
Brook Trout Average Weight: 16.1 g (0.6 oz)
Average K Brook Trout Greater Than 100 mm: 1.04
Number of Brook Trout Greater Than 100 mm: 10
Number of Brook Trout Less Than 100 mm: 12

Stream Conditions: This stream has an overall pool-riffle ratio of about 45%. Riffle areas make up approximately 70% of the stream, while about 15% is made up of pools, 5% in flats, and the remaining 10% is in cascades or bedrock areas. The lower stream has fairly moderate gradient. The stream bottom is composed primarily of sand, gravel, and small rubble with larger rubble, rocks, and boulders. Siltation is heavy in side pools, but riffle areas are clean. Lots of logging debris and down trees are in the stream. In the upper reaches, the bottom is mostly sand and gravel with very few rocks. The upper stream is low gradient, small, and swampy in many places.

Vegetative Conditions: The streambank has about 95% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), yellow birch (Betula alleghaniensis), maples (Acer spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.). About 5% of the stream has only understory vegetation. The upper reaches of the stream become almost impassable due to thick rhododendron.

Discussion: Bivens (1979, 1984) found brook trout present in this stream. It has not been previously listed as a brook trout stream. Brook trout were found all the way up to about 1,180 m (3,870 ft) elevation and the stream has approximately 1.8 km (1.1 mi) of allopatric brook trout water.

The stream has one barrier falls located about 1.0 km (0.6 mi) above the mouth. No rainbow trout were collected in the stream but they are present in Tiger Creek and may soon begin to invade Fall Branch. At the present time, the stream has a healthy brook trout population and protection of this resource should be of first importance. Therefore, a man-made barrier near the mouth is strongly suggested for this stream.

152 Ruins Branch

Map Location: Iron Mountain Gap Quadrangle (208-NW). This stream is a tributary to Tiger Creek that has no name on the quadrangle map. I have listed it as Ruins Branch in order to separate the brook trout population from that of Tiger Creek and account for its distribution length. The stream does not follow the course shown on the quadrangle map. It actually enters Tiger Creek at 988 m (3,240 ft) elevation at the first road culvert just above the mouth of Fall Branch. The quadrangle map shows it to enter Tiger Creek at about 1,006 m (3,300 ft) elevation. Its course may have possibly been changed at some time due to highway construction. Its headwaters begin on the north side of Iron Mountain about 1.6 km (1.0 mi) due west of Little Rock Knob. It is located in Carter County, Tennessee.

Ownership Pattern: The total length of the stream is approximately 1.9 km (1.2 mi) and it is entirely on Forest Service land.

Elevation:
Mouth - 988 m (3,240 ft)
Head - 1,237 m (4,060 ft)

Aspect: North

Stream Size: (Determined 31 May 1984 at the mouth, at 988 m - 3,240 ft elevation):
Approximate Width - 0.6 m (2.0 ft)

Percent Grade: 12.9%

Barriers: Not Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present:
Mayflies (Ephemeroptera)
Crayfish
Salamanders

Fish Collected: 31 May 1984 by Bivens
Brook Trout Average Length: 134.4 mm (5.3 in)
Brook Trout Average Weight: 26.0 g (0.9 oz)
Average K Brook Trout Greater Than 100 mm: 1.07
Number of Brook Trout Greater Than 100 mm: 7
Number of Brook Trout Less Than 100 mm: 2

Stream Conditions: This stream is very small and mostly riffles, but it does have a few good pools and brook trout were collected in these. The stream bottom is comprised primarily of sand, gravel, and rubble with larger rocks and boulders.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), yellow birch (Betula alleghaniensis), maples (Acer spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.).

Discussion: Bivens (1984) found brook trout present in this stream. It has not been previously listed as a brook trout stream. Brook trout were found up to about 1,061 m (3,480 ft) elevation and the stream has approximately 1.1 km (0.7 mi) of allopatric brook trout water.

The stream is very small and supports only a small, but apparently healthy brook trout population. No barriers were observed and rainbow trout (Salmo gairdneri) from Tiger Creek may possibly move into the stream in the future. However, at this time no special management is suggested other than protection of the stream.

153 No-Name Creek (Andy Creek)

Map Location: Iron Mountain Gap Quadrangle (208-NW). This stream is a tributary to Roaring Creek (Ripshin Lake). It enters Ripshin Lake at the upper end near an area on the quadrangle map named Backwoods. It has no name on the quadrangle map and its headwaters begin approximately 1.0 km (0.6 mi) due east of High Rock on Ripshin Ridge in Carter County, Tennessee.

Ownership Pattern: The entire 2.4 km (1.5 mi) of stream is on private land.

Elevation:
Mouth - 1,067 m (3,500 ft)
Head - 1,289 m (4,230 ft)

Aspect: Southeast

Stream Size: Not Recorded

Percent Grade: 9.2%

Barriers: Not Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: No-Name Creek is located entirely on private land. It has a gravel and silt stream bottom and is 1.2 to 1.5 m (4.0 to 5.0 ft) wide. There are pools up to 0.3 m (1.0 ft) deep at bends and around logs, however, most of the stream is shallow and full of gravel. Siltation comes from pasture land adjacent to the stream. A wild population of brook trout is present in this stream. Allopatric brook trout water is estimated to be about 1.1 km (0.7 mi) above the mouth (Elsen, personal communication). The local name of the stream is Andy Creek.

154 George Creek

Map Location: White Rocks Mountain Quadrangle (208-NE) and Iron Mountain Quadrangle (208-NW). This stream is a tributary to Doe River and lies north of Strawberry Mountain in Carter County, Tennessee.

Ownership Pattern: Total stream length is 7.1 km (4.4 mi). The lower 2.3 km (1.4 mi) of stream is on private land. The next 0.8 km (0.5 mi) is on Forest Service land and above this, another 0.5 km (0.3 mi) runs through private land. The remaining upper 3.5 km (2.2 mi) of headwaters are on Forest Service land.

Elevation:
Mouth - 765 m - (2,510 ft)
Lower Forest Service Boundary - 972 m (3,190 ft)
Head - 1,207 m (3,960 ft)

Aspect: Northeast

Stream Size: (Determined in September 1979 at the lower Forest Service boundary, 972 m - 3,190 ft elevation):
Width - 2.1 m (6.9 ft)
Depth - 16.5 cm (5.6 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.14 (4.5 CFS)
Water Level Conditions - normal

Percent Grade: 9.2%

Barriers: 1. A long cascades; about 15.2 m (50.0 ft) vertical height; starts at about 963 m (3,160 ft) elevation.

Water Quality: (Determined 20 June 1968 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 19°C (66°F)

(Determined in September 1978 near the mouth):
pH - 7.5
Dissolved Oxygen - 11 ppm
Hardness - 17 ppm
Alkalinity - 51 ppm
Temperature - 16°C (61°F)
Siltation - light

(Determined in September 1979 at 972 m - 3,190 ft elevation):
pH - 7.3
Total Hardness - 9 ppm
Temperature - 13°C (56°F)
Siltation - slight

Sources of Pollution: Siltation from forest road and trail crossings.

Other Species Present:
Rainbow trout (Salmo gairdneri) - collected only below the cascades area.
Aquatic insects abundant.

Fish Collected: September 1978 by Whitworth and Strange
Brook Trout Average Length: 149.0 mm (5.9 in)
Brook Trout Average Weight: 42.8 g (1.5 oz)
Average K Brook Trout Greater Than 100 mm: 1.02
Number of Brook Trout Greater Than 100 mm: 10
Number of Brook Trout Less Than 100 mm: 0
Rainbow Trout Average Length: 7.3 mm (0.3 in)
Rainbow Trout Average Weight: 5.2 g (0.2 oz)
Number of Rainbow Trout Greater Than 100 mm: 0
Number of Rainbow Trout Less Than 100 mm: 10

September 1979 by Bivens
Brook Trout Average Length: 81.9 mm (3.2 in)
Number of Brook Trout Greater Than 100 mm: 4
Number of Brook Trout Less Than 100 mm: 26

Stream Conditions: The stream has an overall satisfactory pool-riffle ratio of about 40%. It is mostly riffle areas, especially in the upper portion, also, there are a lot of cascades and bedrock area. Riffle areas make up approximately 66% of the stream, while about 10% is made up of pools, 5% in flats, and the remaining 19% is in cascades or bedrock areas. The lower portion of the stream has a good mixture of pools and riffles. The overall stream gradient is moderate. The stream bottom is composed of sand to fine gravel with rubble, large rocks, and boulders. Some siltation is evident but it is not too heavy and there is lots of organic debris along with logs and other debris.

Vegetative Conditions: Approximately 90% of the streambank has overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), birch (Betula spp.), maple (Acer spp.), rhododendron (Rhododendron spp.), mountain laurel (Kalmia latifolia), and witch hazel (Hamamelis virginiana). About 10% of the lower stream is open with no forest cover, this is on private land. Some areas of the stream are snarled with rhododendron, especially in the upper portion, but in general the stream is fairly open.

Discussion: Tatum (1968) listed this stream as having a brook trout population, and the TWRA (1968a) stream survey report listed brook trout along with rainbow trout present in the lower portion of the stream on private land. They stated that about 0.5 km (0.3 mi) of the lower stream has a sympatric brook/rainbow trout population. Rainbow trout were found within 0.8 km (0.5 mi) of the stream below a cascades that apparently is a barrier to fish movement. Bivens (1979) found an allopatric brook trout population on the Forest Service section all the way into the headwaters. The stream appears to have a healthy population of brook trout well protected by a barrier. No management is suggested other than protection of the stream and its brook trout resource.

Brook trout from George Creek were used to stock Briar Creek in Washington County, Tennessee in 1983.

155 Heaton Creek

Map Location: White Rocks Mountain Quadrangle (208-NE) and Carvers Gap Quadrangle (208-SE). This stream is a tributary to Doe River. Its headwaters begin on the north face of Yellow Mountain in Carter County, Tennessee.

Ownership Pattern: The lower 6.4 km (4.0 mi) of stream is on private land, and about 0.6 km (0.4 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 826 m (2,710 ft)
Head - 1,463 m (4,800 ft)

Aspect: North

Stream Size: Not Recorded

Percent Grade: 9.9%

Barriers: None Recorded

Water Quality: (Determined in September 1978 at 1,109 m - 3,650 ft elevation):
pH - 7.0
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
Alkalinity - 68 ppm
Temperature - 15°C (59°F)
Siltation - light

Sources of Pollution: None Recorded

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Dace (Rhinichthys spp.)
Northern hog sucker (Hypentelium nigricans)
Darter (Percid spp.)
Dace, sucker, and darter were collected only at 1,054 m (3,460 ft) elevation sample site.

Fish Collected: September 1978 by Whitworth and Strange
Brook Trout Average Length: 180.0 mm (7.1 in)
Brook Trout Average Weight: 72.3 g (2.6 oz)
Average K Brook Trout Greater Than 100 mm: 1.07
Number of Brook Trout Greater Than 100 mm: 3
Number of Brook Trout Less Than 100 mm: 2
Rainbow Trout Average Length: 173.0 mm (6.8 in)
Rainbow Trout Average Weight: 55.5 g (2.0 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.00
Number of Rainbow Trout Greater Than 100 mm: 20
Number of Rainbow Trout Less Than 100 mm: 9

Stream Conditions: The stream is mostly riffles with a few small pools. The bottom is composed primarily of large rubble and boulders with some sand and gravel.

Vegetative Conditions: The streambank has about 90% forest cover made up predominantly of hemlock (Tsuga canadensis), and other

hardwoods. Bank cover is open and the lower section of the stream is surrounded by cleared land.

Discussion: Whitworth and Strange (1979) found brook trout present in this stream. It has not been previously listed as having brook trout. Brook trout were found at sites at about 1,097 m (3,600 ft) elevation and again at about 1,195 m (3,920 ft) elevation, but the extent of the population has not been documented. They estimated 1.3 km (0.8 mi) of sympatric brook/rainbow trout water. Only a few brook trout were collected along with several rainbow trout at each site. They stated that Heaton Creek probably has only a remnant population of brook trout that is being taken over by rainbow trout. Any management for brook trout would have to involve an extensive removal of rainbow trout from the stream.

156 Toms Branch

Map Location: White Rocks Mountain Quadrangle (208-NE) and Carvers Gap Quadrangle (208-SE). This stream is a tributary to the Doe River. Its headwaters begin on the north face of Roan Mountain in Carter County, Tennessee.

Ownership Pattern: The lower 2.3 km (1.4 mi) of stream is on private land, and the remaining 2.6 km (1.6 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 913 m (2,995 ft)
Head - 1,609 m (5,280 ft)

Aspect: North

Stream Size: (Determined in September 1979 at the lower Forest Service boundary, 1,073 m - 3,520 ft elevation):
Width - 3.3 m (10.7 ft)
Depth - 19.3 cm (7.7 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.12 (6.6 CFS)
Water Level Conditions - normal

Percent Grade: 14.4%

Barriers: None

Water Quality: (Determined in August 1978 at 939 m - 3,080 ft elevation):
pH - 7.5
Dissolved Oxygen - 9 ppm

Hardness - 17 ppm
Alkalinity - 68 ppm
Temperature - 17°C (62°F)
Siltation - light

(Determined in September 1979 at 1,073 m - 3,520 ft elevation):
pH - 7.5
Total Hardness - 12 ppm
Temperature - 13°C (56°F)
Siltation - medium

Sources of Pollution: Siltation from the highway above in the headwaters, and from logging in the lower Forest Service boundary area. Also, siltation from steep surrounding areas.

Other Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)
Central stoneroller (Campostoma anomalum)
Fantail darter (Etheostoma flaballare)
Ephemeroptera
Crayfish
Salamanders

Fish Collected: August 1978 by Whitworth and Strange
Brook Trout Average Length: 149.0 mm (5.9 in)
Brook Trout Average Weight: 38.3 g (1.4 oz)
Average K Brook Trout Greater Than 100 mm: 1.04
Number of Brook Trout Greater Than 100 mm: 22
Number of Brook Trout Less Than 100 mm: 0
Rainbow Trout Average Length: 193.0 mm (8.0 in)
Rainbow Trout Average Weight: 85.2 g (3.0 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.19
Number of Rainbow Trout Greater Than 100 mm: 2
Number of Rainbow Trout Less Than 100 mm: 24

September 1979 by Bivens
Brook Trout Average Length: 128.5 mm (5.1 in)
Number of Brook Trout Greater Than 100 mm: 15
Number of Brook Trout Less Than 100 mm: 12

Stream Conditions: On the Forest Service section of the stream, there is an overall mixture of pools and riffles of about 60%. Riffle areas make up approximately 55% of the stream, while about 32% is made up of pools, 1% in flats, and the remaining 12% is in cascades or bedrock area. The overall stream gradient is fairly steep. No undercut banks are present. The stream bottom is composed of sand to fine gravel with large and small rubble, and very many large boulders.

Siltation is evident but not extremely heavy (logging operation was going on near the lower Forest Service boundary in 1979). There is overall, a good mixture of pools and riffles, and cover for fish is adequate.

On private land, the stream bottom is composed primarily of small and large rubble with some gravel. Siltation is light in the lower portion of the stream. It is mostly riffle areas with shallow pools.

Vegetative Conditions: On Forest Service land, the streambank has approximately 96% of overstory and understood vegetation made up predominantly of birch (Betula spp.), maple (Acer spp.), and rhododendron (Rhododendron spp.). There is about 4% with no overstory and little or no shade providing understory, this is near the lower Forest Service boundary where logging operations were going on. The stream is fairly open with little overhanging vegetation.

On private land, the stream is mostly open farmland with approximately 80% bank cover made up predominantly of hemlock (Tsuga canadensis), American beech (Fagus grandifolia), and maple. About 20% of the stream is open with no overstory and little or no shade providing understory.

Discussion: Tatum (1968) listed this stream as having brook trout. Whitworth and Strange (1979) found brook trout present in the lower portion of the stream on private land. They reported that about 0.5 km (0.3 mi) of the stream has a sympatric brook/rainbow trout population, starting at about 975 m (3,200 ft) elevation. Above this, they found an allopatric brook trout population. They concluded that the stream has a very healthy population of brook trout, but suggested that rainbow trout be removed from the lower section. Bivens (1979) found that an allopatric brook trout population exists on Forest Service land. Brook trout were found to approximately 0.8 km (0.5 mi) above the lower Forest Service boundary. The stream appears to have a healthy brook trout population, but it is suggested that the rainbow trout in the lower section be removed to protect the brook trout population, as there are no natural barriers present. No other management, other than protection of the stream appears necessary.

157 Five Poplar Branch

Map Location: White Rocks Mountain Quadrangle (208-NE) and Carvers Gap Quadrangle (208-SE). This stream is a tributary to Toms Branch which is a tributary to Doe River. Its headwaters begin on the north face of Roan Mountain in Carter County, Tennessee.

Ownership Pattern: The lower 3.3 km (2.1 mi) of stream is on private land, and the remaining 1.2 km (0.8 mi) of stream is on Forest Service land.

Elevation:
Mouth - 920 m (3,020 ft)
Lower Forest Service boundary - 1,244 m (4,080 ft)
Head - 1,548 m (5,080 ft)

Aspect: North

Stream Size: (Determined in September 1979 at the lower Forest Service boundary, 1,244 m - 4,080 ft elevation):
Width - 2.4 m (7.9 ft)
Depth - 10.3 cm (4.1 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.07 (2.3 CFS)
Water Level Conditions - normal

Percent Grade: 13.5%

Barriers:
1. None recorded for private section of the stream.
2. Cascades area at about 1,341 m (4,400 ft) elevation.

Water Quality: (Determined in August 1978 on private section of stream):
pH - 7.5
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
Alkalinity - 68 ppm
Temperature - 17°C (63°F)
Siltation - heavy

(Determined in September 1979 at 1,244 m - 4,080 ft elevation):
pH - 7.5
Total Hardness - 9 ppm
Temperature - 12°C (54°F)
Siltation - moderate

Sources of Pollution: Siltation from highway and jeep road above in the headwaters, steep surrounding areas, and farmland on the private section.

Other Species Present:
No fish species were collected.
Salamanders and aquatic insects were abundant.

Stream Conditions: On the Forest Service section of the stream, there is an overall mixture of pools and riffles of about 35%. Riffle areas make up approximately 61% of the stream, while about 13% is made up of pools, 1% in flats, and the remaining 25% is in cascades or bedrock areas. The overall stream gradient is fairly steep. It has no undercut banks. The stream bottom is composed of fine gravel to large and small rubble with lots of larger rocks and boulders. Organic debris is present with lots of logs and down trees. Siltation is moderate. The bottom composition on private land is made up primarily of sand, gravel, and rubble, The stream is mostly riffles and pools, and siltation is heavy.

Vegetative Conditions: On Forest Service land, the streambank has 100% of overstory vegetation made up predominantly of birch (Betula spp.), and maple (Acer spp.). The stream has almost no overhanging brush. On private land, most of the stream runs through open farm land with little or no stream cover.

Discussion: Tatum (1968) listed this stream as having brook trout. He stated that the population was very low at that time and concluded this was due to erosion caused by forest fires and logging. Whitworth and Strange (1979) surveyed the private section of the stream and generally concluded that is was unsuitable for trout management due to heavy siltation. They found no fish in the stream at all. Bivens (1979) surveyed the Forest Service portion of the stream and found no fish present.

This stream has been classified as potential brook trout water. Although the private section of the stream may be unsuitable for trout management, the Forest Service section of the stream has less siltation and subsequent stocking of brook trout may prove successful without any major stream improvements.

158 Middle Branch

Map Location: White Rocks Mountain (208-NE) and Carvers Gap Quadrangle (208-SE). This stream is a tributary to Toms Branch which is a tributary to Doe River. Its headwaters begin on the north face of Roan Mountain in Carter County, Tennessee.

Ownership Pattern: The lower 1.7 km (1.1 mi) of stream is on private land, and the remaining 1.7 km (1.1 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 931 m (3,055 ft)

Lower Forest Service boundary - 1,085 m (3,560 ft)
Head - 1,475 m (4,840 ft)

Aspect: North

Stream Size: (Determined in September 1979 at the lower Forest Service boundary, 1,085 m -3,560 ft elevation):
Width - 2.6 m (8.6 ft)
Depth - 10.9 cm (4.3 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.09 (3.0 CFS)
Water Level Conditions - normal

Percent Grade: 15.4%

Barriers: None

Water Quality: (Determined in August 1978 at 939 m - 3,080 ft elevation):
pH - 7.5
Dissolved Oxygen - 10 ppm
Hardness - 34 ppm
Alkalinity - 51 ppm
Temperature - 19°C (65°F)
Siltation - medium to heavy in the lower portions

(Determined in September 1979 at 1,085 m - 3,560 ft elevation):
pH - 7.5
Total Hardness - 10 ppm
Temperature - 14°C (57°F)
Siltation - moderate

Sources of Pollution: Siltation from the highway above in the headwaters and siltation from logging in the lower area, private land adjacent to the stream, and some bank erosion.

Other Species Present:
Rainbow trout (Salmo gairdneri)
Central stoneroller (Campostoma anomalum)
Blacknose dace (Rhinichthys atratulus)
Darter (Percid spp.) - collected near the mouth.
Aquatic insects abundant.

Fish Collected: August 1978 by Whitworth and Strange
Brook Trout Average Length: 144.0 mm (5.7 in)
Brook Trout Average Weight: 33.4 g (1.2 oz)
Average K Brook Trout Greater Than 100 mm: 1.11
Number of Brook Trout Greater Than 100 mm; 5
Number of Brook Trout Less Than 100 mm: 1

Rainbow Trout Average Length: 101.0 mm (4.0 in)
Rainbow Trout Average Weight: 11.0 g (0.4 oz)
Number of Rainbow Trout Greater Than 100 mm: 1
Number of Rainbow Trout Less Than 100 mm: 43

September 1979 by Bivens
Brook Trout Average Length: 84.2 mm (3.3 in)
Number of Brook Trout Greater Than 100 mm: 3
Number of Brook Trout Less Than 100 mm: 20

Stream Conditions: On the Forest Service section of the stream, there is an overall mixture of pools and riffles of about 50%. Riffle areas make up approximately 66% of the stream, while about 28% is made up of pools, 1% in flats, and the remaining 5% is in cascades or bedrock areas. The overall stream gradient is fairly steep. There are no undercut banks. The stream bottom is composed of fine gravel with rubble to larger rocks and many boulders. There is organic debris present, and siltation is evident. There is overall, a good mixture of pools and riffles, and cover for fish is adequate.

On private land, the stream bottom is composed of some sand and gravel, but primarily small and large rubble. Siltation is medium to heavy in the lower portion of the stream. The stream at this point is mostly riffles with some shallow pools.

Vegetative Conditions: On Forest Service land, the streambank has approximately 96% of overstory and understory vegetation made up predominantly of birch (Betula spp.), maple (Acer spp.), oak (Quercus spp.), rhododendron (Rhododendron spp.), and witch hazel (Hamamelis virginiana). The stream is fairly open with little overhanging vegetation.

On private land, the forest cover is approximately 90%, made up predominantly of black locust (Robinia pseudoacacia), yellow poplar (Liriodendron tulipifera), and other hardwoods. About 10% of the stream is open with little or no shade providing vegetation. Also, the lower portion of the stream is predominantly surrounded by open farm land.

Discussion: Tatum (1968) listed this stream as having brook trout. He stated that the population was very low at that time and concluded this was due to erosion caused by forest fires and logging. However, Whitworth and Strange (1979) surveyed the private section of the stream and generally concluded that the stream has a healthy brook trout population. They stated that rainbow trout were found to approximately 1.3 km (0.8 mi) above the mouth, a sympatric zone of brook/rainbow trout existed for about 0.3 km (0.2 mi), and about 0.8 km (0.5 mi) of allopatric brook trout water exists to the lower Forest

Service boundary. Bivens (1979) found an allopatric brook trout population from the lower Forest Service boundary to 1.1 km (0.7 mi) above the boundary. The stream appears to have a healthy brook trout population and no extraordinary management is suggested, other than protection of the stream and if possible, removal of the rainbow trout in the lower section of the stream. There are no natural barriers and it is probable that the rainbow trout population will expand its range in the future. Also, rainbow trout were found in above the brook trout on the Right Prong Middle Branch and need to be removed if possible. They could possibly move down to Middle Branch and become established in the future.

159 Right Prong Middle Branch

Map Location: Carvers Gap Quadrangle (208-SE). This stream is a tributary to Middle Branch. It has no name listed on the quadrangle map, and Bivens (1979) listed it as Right Prong Middle Branch in order to delineate its population distribution length. It enters Middle Branch at approximately 1,158 m (3,800 ft) elevation. Its headwaters begin on the north face of Roan Mountain in Carter County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on Forest Service land.

Elevation:
Mouth - 1,158 m (3,800 ft)
Head - 1,500 m (4,920 ft)

Aspect: North

Stream Size: Not Recorded

Percent Grade: 16.3%

Barriers:
1. Cascades; at about 1,280 m (4,200 ft) elevation.
2. Falls; about 3.0 m (10.0 ft) vertical height; at about 1,378 m (4,520 ft) elevation.

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present:
Rainbow trout (*Salmo gairdneri*)

Fish Collected: September 1979 by Bivens
Brook Trout Average Length: 78.3 mm (3.1 in)
Number of Brook Trout Greater Than 100 mm: 0
Number of Brook Trout Less Than 100 mm: 9
Rainbow Trout Average Length: 112.3 mm (4.4 in)
Number of Rainbow Trout Greater Than 100 mm: 11
Number of Rainbow Trout Less Than 100 mm: 2

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: Bivens (1979) found this stream to have a brook trout population, it has not been previously listed as having brook trout. An allopatric brook trout population exists from mouth to about 0.6 km (0.4 mi) above the mouth. Above the brook trout, rainbow trout were found for another 0.3 km (0.2 mi). This is an unusual situation as brook trout generally occupy headwater reaches of streams above other trout species. It is very probable that the rainbow trout were stocked above the brook trout by private individuals. It is suggested that the rainbow trout be removed from the stream to protect the brook trout population. No other management, other that protection of the stream appears necessary.

160 Panther Branch

Map Location: White Rocks Mountain Quadrangle (209-NE) and Iron Mountain Gap Quadrangle (208-NE). This stream is a tributary to Doe River. Its headwaters begin on the south side of Pine Mountain in Carter County, Tennessee.

Ownership Pattern: The entire 1.9 km (1.2 mi) of stream is on Forest Service land.

Elevation:
Mouth - 977 m (3,205 ft)
Head - 1,207 m (3,960 ft)

Aspect: Southeast

Stream Size: (Determined 5 June 1984 at the mouth, 977 m - 3,205 ft elevation):
Width - 1.8 m (5.8 ft)
Depth - 9.9 cm (3.9 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.05 (1.5 CFS)
Water Level Conditions - normal

Percent Grade: 11.9%

Barriers: None

Water Quality: (Determined in September 1978 at 1,000 m - 3,280 ft elevation):
pH - 7.0
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
Alkalinity - 68 ppm
Temperature - 17°C (63°F)
Siltation - very light

Sources of Pollution: None Recorded

Other Fish Species Present: No other fish species collected.

Fish Collected: September 1978 by Whitworth and Strange
Brook Trout Average Length: 135.0 mm (5.3 in)
Brook Trout Average Weight: 28.9 g (1.0 oz)
Average K Brook Trout Greater Than 100 mm: 1.10
Number of Brook Trout Greater Than 100 mm: 4
Number of Brook Trout Less Than 100 mm: 1

5 June 1984 by Bivens
Brook Trout Average Length: 113.1 mm (4.5 in)
Brook Trout Average Weight: 14.1 g (0.5 oz)
Average K Brook Trout Greater Than 100 mm: 0.97
Number of Brook Trout Greater Than 100 mm: 7
Number of Brook Trout Less Than 100 mm: 5

Stream Conditions: The stream is mostly riffle areas with shallow pools. Its bottom is composed predominantly of sand, gravel, and shale bedrock. The stream is very clean with very little siltation.

Vegetative Conditions: The streambank has approximately 90% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), other hardwoods, and rhododendron (Rhododendron spp.). The stream is snarled and tangled with rhododendron.

Discussion: Whitworth and Strange (1979) found brook trout present in this stream. It has been previously listed as a brook trout stream. They documented brook trout in one section at about 1,000 m (3,280 ft) elevation. Bivens (1984) found brook trout up to about 1,036 m (3,400 ft) elevation. The stream has approximately 1.0 km (0.6 mi) of allopatric brook trout water.

Whitworth and Strange stated that, although wide enough,

the stream appears to be somewhat intermittent and lacks a good pool-riffle ratio. These factors may be limiting the fish size and their upstream range, even though no competition occurs from other trout species. They suggested management toward stream modifications that increase cover for fish, for example, artificial pools may be beneficial.

161 Cove Creek

Map Location: White Rocks Mountain Quadrangle (208-NE) and Bakersville Quadrangle (208-SW). This stream is a tributary to Doe River. Its headwaters begin on the north face of Roan Mountain near Toll House Gap in Carter County, Tennessee.

Ownership Pattern: The lower 2.3 km (1.4 mi) of stream is on private land, and the remaining 1.8 km (1.1 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 988 m (3,240 ft)
Head - 1,670 m (5,480 ft)

Aspect: North

Stream Size:
Average Width - 2.1 m (7.0 ft)
Width Varies - 0.9 to 4.6 m (3.0 to 15.0 ft)
Average Pool Depth - 0.3 m (1.0 ft)
Average Riffle Depth - 15.2 cm (6.0 in)

Percent Grade: 17.0%

Barriers: 1. Falls; approximately 3.7 m (12.0 ft) vertical height; at about 1,320 m (4,330 ft) elevation.

Water Quality: (Determined in 1950 by Shields):
Maximum Temperature - 17°C (63°F)

(Determined 6 June 1968 by TWRA stream survey):
pH - 6.5
Dissolved Oxygen - 9 ppm
Hardness - 51 ppm
M.O. Alkalinity - 34 ppm
Temperature - 12°C (54°F)

(Determined in September 1978 at 1,134 m - 3,720 ft elevation):
pH - 7.5
Dissolved Oxygen - 10 ppm

Hardness - 34 ppm
Alkalinity - 68 ppm
Temperature - 17°C (63°F)
Siltation - light

Sources of Pollution: None Recorded

Other Species Present:
Rainbow trout (Salmo gairdneri)
Dace (Rhinichthys spp.)
Darter (Percid spp.)
(the above species were collected only near the mouth)
Mayflies (Ephemeroptera)
Salamanders

Fish Collected: September 1978 by Whitworth and Strange
Brook Trout Average Length: 151.0 mm (5.9 in)
Brook Trout Average Weight: 38.8 g (1.4 oz)
Average K Brook Trout Greater Than 100 mm: 1.07
Number of Brook Trout Greater Than 100 mm: 12
Number of Brook Trout Less Than 100 mm: 2
Rainbow Trout Average Length: 221.0 mm (8.7 in)
Rainbow Trout Average Weight: 161.5 g (5.8 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.21
Number of Rainbow Trout Greater Than 100 mm: 3
Number of Rainbow Trout Less Than 100 mm: 0

4 June 1984 by Bivens
Brook Trout Average Length: 132.5 mm (5.2 in)
Brook Trout Average Weight: 27.5 g (1.0 oz)
Average K Brook Trout Greater Than 100 mm: 1.18
Number of Brook Trout Greater Than 100 mm: 11
Number of Brook Trout Less Than 100 mm: 1

Stream Conditions: The stream is mostly riffles and pools, with some cascades. Its bottom is composed predominantly of large rubble and boulders, with lots of sand and fine grave. Siltation in the stream is light.

Vegetative Conditions: The streambank has approximately 90% of overstory and understory vegetation made up primarily of hardwoods, yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), maples (Acer spp.), and the bank cover is open with little or no rhododendron (Rhododendron spp.).

Discussion: Shields (1950) surveyed trout streams in east Tennessee, and in his report he stated that Cove Creek was an excellent brook trout stream. The TWRA (1968a) stream survey

report listed brook trout along with rainbow trout as the primary species present. Whitworth and Strange (1979) surveyed the section of the stream on private land and found brook trout still present. They stated that the population is healthy and of sufficient size to maintain itself, and that rainbow trout invasion or habitat degradation does not appear to be a problem. They found a few rainbow trout near the mouth. Their survey reported brook trout from near the mouth to about 1,158 m (3,800 ft) elevation. Bivens (1984) found brook trout up to about 1,292 m (4,240 ft) elevation. The stream has approximately 2.3 km (1.4 mi) of allopatric brook trout water and about 0.2 km (0.1 mi) of sympatric brook/rainbow trout near the mouth.

No special management appears necessary, other than protection of the stream and its brook trout resource. However, there are no barriers in the lower stream and rainbow trout may be a threat to the population in the future.

162 Little Cove Creek

Map Location: White Rocks Mountain Quadrangle (208-NE) and Carvers Gap Quadrangle (208-SE). This stream is a tributary to Cove Creek which is a tributary to Doe River. Its headwaters begin on the north face of Roan Mountain in Carter County, Tennessee.

Ownership Pattern: The lower 1.8 km (1.1 mi) of stream is on private land, and the remaining 2.1 km (1.3 mi) of stream is on Forest Service land.

Elevation:
Mouth - 1,001 m (3,285 ft)
Lower Forest Service boundary - 1,183 m (3,880 ft)
Head - 1,646 m (5,400 ft)

Aspect: North

Stream Size: (Determined in Spetember 1979 at the lower Forest Service boundary, 1,183 m - 3,880 ft elevation):
Width - 3.3 m (10.7 ft)
Depth - 17.0 cm (6.8 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.22 (7.3 CFS)
Water Level Conditions - normal

Percent Grade: 12.0%

Barriers:
1. None recorded for the private section of the stream.

2. Falls; 4.7 m (16.0 ft) vertical height; at about 1,228 m (4,030 ft) elevation.

Water Quality: (Determined in August 1978 at 1,106 m - 3,630 ft elevation):

pH - 7.0
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
Alkalinity - 34 ppm
Temperature - 17°C (63°F)
Siltation - light

(Determined in September 1979 at 1,183 m - 3,880 ft elevation):
pH - 7.5
Total Hardness - 6 ppm
Temperature - 12°C (54°F)
Siltation - light

Sources of Pollution: Siltation from the highway and jeep road above in the headwaters, from steep surrounding areas, and from farmland on the private section of the stream.

Other Species Present:
Dace (Rhinichthys spp.) - collected near the mouth only.
Darter (Percid spp.) - collected near the mouth only.
Crayfish, salamanders, and aquatic insects.

Fish Collected: August 1978 by Whitworth and Strange
Brook Trout Average Length: 164.0 mm (6.5 in)
Brook Trout Average Weight: 51.5 g (1.8 oz)
Average K Brook Trout Greater Than 100 mm: 1.07
Number of Brook Trout Greater Than 100 mm: 12
Number of Brook Trout Less Than 100 mm: 9

Stream Conditions: On the Forest Service section of the stream, there is an overall mixture of pools and riffles of about 70%. It has many cascades that terminate in good pools. Riffle areas make up approximately 42% of the stream, while about 22% is made up of pools, no flats at all, and the remaining 36% in cascades or bedrock areas. The overall stream gradient is fairly steep. It has no undercut banks. The stream bottom is composed of fine gravel to large and small rubble with very many boulders. There is some organic debris present and siltation is light. The bottom composition on private land is made up of sand and gravel, with small to medium rocks, and large rubble up to boulders. It is made up mostly of riffle areas with a few small pools and cascades. Siltation is light to medium in places.

Vegetative Conditions: On Forest Service land, the streambank has 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), maple (Acer spp.), rhododendron (Rhododendron spp.), and witch hazel (Hamamelis virginiana).

On private land, the forest cover is approximately 90%. It is made up predominantly of hemlock (Tsuga canadensis), American beech (Fagus grandifolia), and yellow buckeye (Aesculus octandra). About 10% of the streambank is open with little or no shade providing vegetation. Also, a significant portion of the stream is surrounded by farmland.

Discussion: Shields (1950) surveyed trout streams in east Tennessee, and in his report he stated that Little Cove Creek was an excellent brook trout stream. Tatum (1968) listed the stream as having a healthy brook trout population. Whitworth and Strange (1979) also listed the stream as having brook trout, and stated that the stream appeared to have brook trout from the mouth to the headwaters. However, Bivens (1979) found no brook trout or any other fish species above the lower Forest Service boundary at 1,183 m (3,880 ft) elevation. The brook trout population in Little Cove Creek is relegated to the private section of the stream. Approximately 1.3 km (0.8 mi) of allopatric brook trout stream exists on private land.

This stream has been classified as pure brook trout water. Although the private section is surrounded by farmland, siltation does not appear to be a problem. Therefore, no specific management is suggested at this time other than protection of the stream. There are no barriers on the private section of the stream and there may be a future threat to the brook trout population from rainbow trout invasion from the lower part of Cove Creek.

163 Duck Branch

Map Location: White Rocks Mountain Quadrangle (208-NE) and Iron Mountain Gap Quadrangle (208-NW). This stream is a tributary to the headwaters of Doe River. Its headwaters begin about 1.4 km (0.9 mi) southeast of Hughes Gap. The stream is located in Carter County, Tennessee.

Ownership Pattern: The entire 1.6 km (1.0 mi) of stream is on private land.

Elevation:
Mouth - 1,000 m (3,280 ft)
Head - 1,262 m (4,140 ft)

Aspect: Northeast

Stream Size: (Determined 6 June 1984 at the mouth, at 1,000 m - 3,280 ft elevation):
Width - 1.7 m (5.5 ft)
Depth - 6.4 cm (2.5 in)
Velocity - 0.6 meter per second (2.0 feet per second)
Cubic Meters Per Second - 0.05 (1.8 CFS)
Water Level Conditions - normal

Percent Grade: 16.3%

Barriers: Not Recorded

Water Quality: Not Recorded

Sources of Pollution: Domestic rubbish.

Other Species Present:
Blacknose dace (Rhinichthys atratulus)
Central stoneroller (Campostoma anomalum)
Mayflies (Ephemeroptera)
Crayfish
Salamanders
Snails

Fish Collected: 6 June 1984 by Bivens
Brook Trout Average Length: 119.0 (4.7 in)
Brook Trout Average Weight: 21.3 g (0.8 oz)
Average K Brook Trout Greater Than 100 mm: 1.26
Number of Brook Trout Greater Than 100 mm: 3
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: The stream is very small and is mostly riffles with very few shallow pools. The bottom is composed of sand, fine gravel, and rubble along with rocks and a few boulders. Siltation is heavy along with lots of domestic rubbish.

Vegetative Conditions: The streambank has approximately 95% overstory and understory vegetation made up predominantly of yellow poplar, (Liriodendron tulififera), yellow buckeye (Aesculus octandra), hemlock (Tsuga canadensis), maples (Acer spp.), other hardwoods, witch hazel (Hamamelis virginiana), and rhododendron (Rhododendron spp.).

Discussion: Bivens (1984) found brook trout present in this stream. It has not been listed previously as having brook trout. The stream is very small and only a few brook trout were collected above the mouth. Due to its small size and stream conditions, the stream probably has no management potential for brook trout.

164 Stony Creek (Headwaters)

Map Location: Elizabethton Quadrangle (207-SW), Keenburg Quadrangle (207-NW), Carter Quadrangle (207-NE), and Doe Quadrangle (214-NE). This stream is a major tributary to Watauga River. Its headwaters begin high on the south side of Holston Mountain northeast of Old Road Ridge in Carter County, Tennessee.

Ownership Pattern: Total stream length is approximately 23.8 km (14.8 mi). Only about 4.5 km (2.8 mi) of headwater is on Forest Service land, the rest is on private land.

Elevation:
Mouth - 474 m (1,555 ft)
Head - 1,158 m (3,800 ft)

Aspect: Southwest

Stream Size: (Headwaters - determined in September 1978 at 756 m - elevation):
Width - 2.4 m (8.0 ft)
Depth - 12.7 cm (5.0 ft)
Velocity - 0.4 meter per second (1.3 foot per second)
Cubic Meters Per Second - 0.13 (4.3 CFS)
Water Level Conditions - low

Percent Grade:
Overall - 2.9%
Headwaters - 8.1%

Barriers: None

Water Quality: (Determined in 1950 by Shields
pH - 6.9 upper portion of stream
pH - 7.8 lower portion of stream
Maximum Temperature - 18°C (65°F) upper portion
Maximum Temperature - 19°C (67°F) lower portion

(Determined 26 June 1968 by TWRA stream survey):
pH - 6.0
Dissolved Oxygen - 8 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 17°C (62°F)

Sources of Pollution: Domestic rubbish in the lower portion of the stream. None in the headwaters of the stream.

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Sculpin (Cottus spp.)
Blacknose dace (Rhinichthys atratulus)
Fantail darter (Etheostoma flabellare)

Fish Collected: September 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 72
Number of Brook Trout Less Than 100 mm: 75
Number of Rainbow Trout Greater Than 100 mm: 36
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: On Forest Service land, there is an overall mixture of pools and riffles of about 75%. Riffle areas make up approximately 50% of the stream while about 30% is made up of pools, no flats, and the remaining 20% is in cascades or bedrock areas. The stream bottom is composed of gravel, large rubble, and boulders with bedrock in the upper portions. There are some good pools, and siltation is slight.

Vegetative Conditions: The streambank on Forest Service land has approximately 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), and rhododendron (Rhododendron spp.).

Discussion: The headwaters of this stream was listed by the TWRA (1968a) stream survey report as primarily having brook trout present. Elsen (1978) also found brook trout present, along with an invading population of rainbow trout. He stated that the headwaters of Stony Creek has excellent water quality and a healthy population of native brook trout that needs protection. He suggested a barrier and rainbow trout removal to protect the brook trout. To date, however, this has not been done. Protection of this brook trout resource should be of first importance.

165 Little Stony Creek

Map Location: Keenburg Quadrangle (207-NW). This stream is a tributary to Stony Creek. Its headwaters begin on the southeast side of Holston Mountain just northeast of Little Stony Gap in Carter County, Tennessee.

Ownership Pattern: The lower 1.4 km (0.9 mi) of stream is on private land, and the remaining 6.1 km (3.8 mi) of headwater stream is on Forest Service land.

Elevation:
Mouth - 482 m (1,580 ft)
Head - 1,128 m (3,700 ft)

Aspect: South

Stream Size: (Determined in April 1978 at 543 m - 1,780 ft elevation):
Width - 2.1 m (7.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.11 (3.5 CFS)
Water Level Conditions - normal

Percent Grade: 8.5%

Barriers: 1. Large cascades at about 640 m (2,100 ft) elevation.

Water Quality: (Determined 26 June 1968 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 8 ppm
Hardness - 34 ppm
M.O. Alkalinity - 17 ppm
Temperature - 17°C (62°F)

Sources of Pollution: Some siltation from jeep road.

Other Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)
Mottled sculpin (Cottus bairdi)
Fantail darter (Ethoestoma flabellare)
Stoneflies (Plecoptera)
Caddisflies (Trichoptera)
Crayfish

Fish Collected: May and June 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 29
Number of Brook Trout Less Than 100 mm: 30
Number of Rainbow Trout Greater Than 100 mm: 6
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: On Forest Service land, there is an overall mixture of pools and riffles of about 70%. Riffle areas make up approximately 55% of the stream while about 25% is made up of pools, no flats, and the remaining 20% is in cascades or bedrock areas. The stream bottom is composed of large and small rubble, gravel, and some bedrock areas. Siltation is slight.

Vegetative Conditions: On Forest Service land, the streambank has approximately 99% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), birch (Betula spp.), oak (Quercus spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.). About 1% of the streambank has no overstory and little or no shade providing understory.

Discussion: Tatum (1968) listed this stream as having brook trout. He stated that the population was very low at that time and concluded this was due to erosion caused by forest fires and logging. The TWRA (1968a) stream survey report listed brook trout as the primary species present in Little Stony Creek. Elsen (1978) found brook trout still present in the stream with a few rainbow trout in the lower reaches. He stated that Little Stony Creek has excellent water quality along with a nice population of native brook trout.

Although rainbow trout are present in the stream, a large cascades apparently acts as a barrier to upstream movement of of the rainbows and the brook trout population is protected above this barrier. No extraordinary management is suggested at this time other than protection of the stream. However, periodic removal of rainbow trout and stream improvements would be beneficial to the brook trout fishery.

Sixty native brook trout from Little Stony Creek were transported to Round Knob Branch in Greene County in 1983.

166 North Fork Stony Creek

Map Location: Carter Quadrangle (207-NE) and Doe Quadrangle (214-NW). This stream is a tributary to Stony Creek. Its headwaters begin on Holston Mountain just northwest of Old Road Ridge in Carter County, Tennessee.

Ownership Pattern: The lower 1.0 km (0.6 mi) of stream is on private land, and the upper 3.5 km (2.2 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 713 m (2,340 ft)
Head - 1,113 m (3,650 ft)

Aspect: Southwest

Stream Size: (Determined in May 1978 at 750 m - 2,460 ft elevation):
Width - 2.1 m (7.0 ft)
Depth - 0.3 meter per second (1.1 foot per second)

Velocity - 0.3 meter per second (1.1 foot per second)
Cubic Meters Per Second - 0.09 (2.9 CFS)
Water Level Conditions - moderately high

Percent Grade: 8.9%

Barriers: None

Water Quality: (Determined 26 June 1968 by TWRA stream survey):
pH 6.5
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 18°C (65°F)

Sources of Pollution: None

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Mottled sculpin (Cottus bairdi)

Fish Collected: May 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 9
Number of Brook Trout Less Than 100 mm: 2
Number of Rainbow Trout Greater Than 100 mm: 7
Number of Rainbow Trout Less Than 100 mm: 1

Stream Conditions: There is an overall mixture of pools and riffles of about 50%. Riffle areas make up approximately 55% of the stream while about 20% is made up of pools, no flats, and the remaining 25% is in cascades or bedrock areas. The stream bottom is composed of gravel, rubble, and some bedrock. Siltation is slight.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.).

Discussion: Tatum (1968) listed this stream as having a healthy brook trout population. Elsen (1978) also found brook trout present, along with an invading population of rainbow trout. He stated that the North Fork Stony Creek has excellent water quality and a native population of brook trout that needs protection. He suggested a barrier and rainbow trout removal to protect the brook trout. To date, however, this has not been done. Protection of the brook trout resource should be of first importance.

167 Pole Branch

Map Location: Doe Quadrangle (214-NW) and Carter Quadrangle (207-NE). This stream is a tributary to North Fork Stony Creek which is a tributary to Stony Creek. Its headwaters begin on the south side of Holston Mountain in Carter County, Tennessee.

Ownership Pattern: The entire 1.8 km (1.1 mi) of stream is on Forest Service land.

Elevation:
Mouth - 756 (2,480 ft)
Head - 1,052 m (3,450 ft)

Aspect: South

Stream Size: Not Recorded

Percent Grade: 16.7%

Barriers: None

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Fish Collected: May 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 5
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion; Elsen (1978) found brook trout present in this stream. It has not been listed previously as having brook trout. He stated that Pole Branch has a native brook trout population that needs protection from upstream movement of rainbow trout (Salmo gairdneri) from North Fork Stony Creek. He suggested that a barrier on North Fork Stony Creek below the mouth of Pole Branch and rainbow trout removal would help to protect both streams as well as to allow brook trout from both streams to mix. To date, however, this has not been done. Protection of the brook trout population should be of first importance.

168 Campbell Creek

Map Location: Doe Quadrangle (214-NW). This stream is a tributary to Doe Creek. Its headwaters begin high on the south side of Iron Mountain in Johnson County, Tennessee.

Ownership Pattern: The lower 5.6 km (3.5 mi) of stream is on private land, and the remaining 1.4 km (0.9 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 668 m (2,190 ft)
Head - 1,049 m (3,440 ft)

Aspect: South

Stream Size: (Determined in June 1978 at 744 m - 2,440 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.08 (2.5 CFS)
Water Level Conditions - slightly high

Percent Grade: 5.4%

Barriers: 1. Undescribed barrier located about 817 m (2,680 ft) elevation.

Water Quality: Determined 18 June 1969 by TWRA stream survey):
pH - 7.5
Dissolved Oxygen - 10 ppm
Hardness - 86 ppm
M.O. Alkalinity - 86 ppm
Temperature - 17°C (63°F)

Sources of Pollution: None

Other Species Present: Rainbow trout (*Salmo gairdneri*)

Fish Collected: June 1978 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 21
Number of Rainbow Trout Less Than 100 mm: 49

Stream Conditions: On Forest Service land, there is an overall mixture of pools and riffles of about 60%. Riffle areas make up approximately 45% of the stream while about 25% is made up of pools, 15% in flats, and the remaining 15% is in cascades or bedrock areas. The stream bottom is composed of gravel,

rubble, boulders, and some bedrock. Boulders, fallen logs, and bedrock ledges help to create good pools. Some areas of the stream tends to sink beneath the rocks. Siltation is light.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), hemlock (Tsuga canadensis), oak (Quercus spp.), and rhododendron (Rhododendron spp.).

Discussion: Tatum (1968) listed this stream as having brook trout in the headwaters. He stated that the population was very low at that time and concluded this was due to erosion caused by forest fires and logging. The TWRA (1969b) stream survey report also listed brook trout along with rainbow trout as the primary fish species present. However, Elsen (1978) found only rainbow trout present in the stream. Although water quality appears excellent, this stream probably has no future management for brook trout due to its small size and the firmly established rainbow trout population.

169 Mill Creek

Map Location: Mountain City Quadrangle (214-NE) and Sherwood Quadrangle (214-SE). This stream is a tributary to Roan Creek. Its headwaters begin just north of Locust Gap in Johnson County, Tennessee.

Ownership Pattern: The entire 5.8 km (3.6 mi) of stream is on private land.

Elevation:
Mouth - 652 m (2,140 ft)
Head - 1,097 m (3,600 ft)

Aspect: Northwest

Stream Size:
Average Width - 2.1 m (7.0 ft)
Width Varies - 0.9 to 4.6 m (3.0 to 15.0 ft)
Average Pool Depth - 25.4 cm (10.0 in)
Average Riffle Depth - 10.2 cm (4.0 in)

(Determined in May 1979 at about 811 m - 2,660 ft elevation):
Average Width - 1.5 m (4.9 ft)

Percent Grade: 7.7%

Barriers: None Recorded

Water Quality: (Determined 16 June 1969 by TWRA stream survey):
pH - 7.5
Dissolved Oxygen - 9 ppm
Hardness - 68 ppm
M.O. Alkalinity - 68 ppm
Temperature - 18°C (64°F)

(Determined in May 1979 at 878 m - 2,880 ft elevation):
pH - 6.5
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
Alkalinity - 17 ppm
Temperature - 12°C (53°F)
Siltation - heavy

Sources of Pollution: Sawmill and logging operations in the headwaters.

Other Speceis Present:
Rainbow trout (Salmo gairdneri)
Banded sculpin (Cottus carolinae)
Blacknose dace (Rhinichthys atratulus)
Creek chub (Semotilus atromaculatus)
Crayfish
Salamanders

Fish Collected: May 1979 by Whitworth and Strange
Brook Trout Average Length: 126.0 mm (5.0 in)
Brook Trout Average Weight: 19.4 g (0.7 oz)
Average K Brook Trout Greater Than 100 mm: 0.83
Number of Brook Trout Greater Than 100 mm: 9
Number of Brook Trout Less Than 100 mm: 4
Only One Rainbow Trout: Length - 155.0 mm (6.1 in)
Weight - 35.0 g (1.3 oz)

28 June by Bivens
Brook Trout Average Length: 123.8 mm (4.9 in)
Brook Trout Average Weight: 21.5 g (0.8 oz)
Average K Brook Trout Greater Than 100 mm: 1.13
Number of Brook Trout Greater Than 100 mm: 6
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: The stream bottom is composed predominantly of sand and gravel with small to large rubble and a few boulders. Siltation is heavy. Down trees and dead rhododendron (Rhododendron spp.) litter the stream. Some trash is in the stream.

Vegetative Conditions: Forest cover is about 70% and bank cover is variable and mostly rhododendron.

Discussion: The TWRA (1969b) stream survey listed only rainbow trout as the primary species present in Mill Creek. However, Whitworth and Strange (1979) found brook trout present in the headwaters of the stream. They documented brook trout at 835 m (2,740 ft) elevation and at 878 m (2,880 ft) elevation. Only one rainbow trout was collected. Bivens (1984) found brook trout down to 732 m (2,400 ft) elevation and collected no rainbow trout. The stream has approximately 2.1 km (1.3 mi) of allopatric brook trout water.

Whitworth and Strange (1979) generally concluded that the brook trout population appeared healthy, and that competition from rainbow trout was not significant. However, they stated that heavy siltation from a sawmill and logging operation in the headwaters may be reducing recruitment. Management should be directed at protection of this brook trout resource.

170 Vaught Creek

Map Location: Mountain City Quadrangle (214-NE) and Sherwood Quadrangle (214-SE). This stream is a tributary to Roan Creek. Its headwaters begin on the northwest side of the Stone Mountains about 1.6 km (1.0 mi) northwest of The Bald. It is located in Johnson County, Tennessee.

Ownership Pattern: The entire 6.3 km (3.9 mi) of stream is on private land.

Elevation:
Mouth - 676 m (2,218 ft)
Head - 1,042 m (3,420 ft)

Aspect: Northwest

Stream Size: (Determined 28 June 1984 at 814 m - 2,670 ft elevation):
Width - 4.6 m (15.0 ft)
Depth - 17.0 cm (6.7 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.30 (10.1 CFS)
Water Level Conditions - normal

Percent Grade: 5.8%

Barriers: None

Water Quality: (Determined 16 June 1969 by TWRA stream survey):
pH - 6.5
Dissolved Oxygen - 10 ppm
Hardness - 34 ppm
M.O. Alkalinity - 17 ppm
Temperature - 14°C (58°F)

(Determined 28 June 1984 at 814 m - 2,670 ft elevation):
pH - 7.3
Total Hardness - 12 ppm
Temperature - 14°C (58°F)

Sources of Pollution: Not Recorded

Other Fish Species Present:
Sculpin (Cottus spp.)
Fantail darter (Etheostoma flabellare)
Blacknose dace (Rhinichthys atratulus)
Creek chub (Semotilus atromaculatus)
Central stoneroller (Campostoma anomalum)

Fish Collected: June 1984 by Bivens
Brook Trout Average Length: 154.0 mm (6.1 in)
Brook Trout Average Weight: 38.7 g (1.4 oz)
Average K Brook Trout Greater Than 100 mm: 1.06
Number of Brook Trout Greater Than 100 mm: 6
Number of Brook Trout Less Than 100 mm: 2

Stream Conditions: The stream has a sand and gravel substrate with rubble, rocks, and boulders. The stream is approximately 70% riffles, 25% pools, and 5% bedrock or flats.

Vegetative Conditions: The entire stream has approximately 70% open pasture and only about 30% canopy. The brook trout section of the stream has about 50% canopy made up predominantly of yellow poplar (Liriodendron tulipifera), red maple (Acer rubrum), American sycamore (Platanus occidentalis), sumac (Rhus spp.), and rhododendron (Rhododendron spp.).

Discussion: The TWRA (1969b) stream survey report listed brook trout as the primary species present in Vaught Creek. Bivens (1984) found brook trout still present in the upper portion of the stream. Brook trout were found from about 792 m (2,600 ft) elevation up to 840 m (2,755 ft) elevation. The stream has approximately 1.0 km (0.6 mi) of allopatric brook trout water. It becomes very small above the confluence with Furnace Creek and no fish were collected there. The stream appears to have a fairly healthy population of brook trout and no management is suggested other than protection of the stream.

171 Furnace Creek (Crackerneck Creek)

Map Location: Mountain City Quadrangle (214-NE) and Sherwood Quadrangle (214-SE). This stream is a tributary to Vaught Creek. Its headwaters begin on the northwest side of the Stone Mountains near Vaught Gap. It is located in Johnson County, Tennessee.

Ownership Pattern: The entire 2.7 km (1.7 mi) of stream is on private land.

Elevation:
Mouth - 840 m (2,755 ft)
Head - 1,215 m (3,985 ft)

Aspect: Northwest

Stream Size: (Determined 27 June 1984 at the mouth, at 840 m - 2,755 ft elevation):
Width - 2.4 m (8.0 ft)
Depth - 14.0 cm (5.5 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.11 (3.5 CFS)
Water Level Conditions - normal

Percent Grade: 13.7%

Barriers: None

Water Quality: (Determined 27 June 1984 at 840 m - 2,755 ft elevation):
pH - 6.8
Total Hardness - 7 ppm
Temperature - 14°C (58°F)

Sources of Pollution: Not Recorded

Other Fish Species Present:
Banded sculpin (Cottus carolinae)
Blacknose dace (Rhinichthys atratulus)

Fish Collected: 27 June 1984 by Bivens
Brook Trout Average Length: 151.0 mm (5.9 in)
Brook Trout Average Weight: 38.9 g (1.4 oz)
Average K Brook Trout Greater Than 100 mm: 1.13
Number of Brook Trout Greater Than 100 mm: 8
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: The stream has a pool-riffle ratio of about 75%. Riffle areas make up approximately 55% of the stream,

while about 35% is in pools, 5% in flats, and the remaining 5% is in cascades or bedrock area. Good stream conditions and cover for fish exist. The bottom is composed primarily of sand, gravel, and rubble with rocks and boulders. The overall stream gradient is moderate.

Vegetative Conditions: The streambank has 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), yellow birch (Betula alleghaniensis), maples (Acer spp.), and rhododendron (Rhododendron spp.).

Discussion: Bivens (1984) found brook trout present in this stream. It has not been previously listed as having brook trout. Brook trout were found from the mouth at 840 m (2,755 ft) elevation up to about 1,012 m (3,320 ft) elevation. The stream has 1.9 km (1.2 mi) of allopatric brook trout water. Good stream conditions exist and the stream has a healthy population of brook trout. Therefore, no management is suggested other than protection of the stream.

172 East Fork

Map Location: Sherwood Quadrangle (214-SE). This stream is a headwater tributary to Furnace Creek. Its headwaters begin on the west side of the Stone Mountains about 1.6 km (1.0 mi) north of Vaught Gap. It is located in Johnson County, Tennessee.

Ownership Pattern: The entire 1.1 km (0.7 mi) of stream is on private land.

Elevation:
Mouth - 1,009 m (3,310 ft)
Head - 1,228 m (4,030 ft)

Aspect: Southwest

Stream Size: Not Recorded

Percent Grade: 19.5%

Barriers: Not Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Fish Species Present: None

Fish Collected: 27 June 1984 by Bivens
Brook Trout Average Length: 141.0 mm (5.6 in)
Brook Trout Average Weight: 32.3 g (1.2 oz)
Average K Brook Trout Greater Than 100 mm: 1.15
Number of Brook Trout Greater Than 100 mm: 3
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: The stream is very small with a sand and gravel bottom. It has a moderate to steep gradient.

Vegetative Conditions: The streambank has 100% overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), maples (Acer spp.), and rhododendron (Rhododendron spp.).

Discussion: Bivens (1984) found brook trout present in this stream. It has not been previously listed as having brook trout. The stream is very small and only a few brook trout were collected above the mouth. Due to its small size, the stream probably has no management potential for brook trout. However, the stream should be protected.

173 Furnace Creek (Headwaters)

Map Location: Mountain City Quadrangle (214-NE), Laurel Bloomery Quadrangle (213-SE), and Grayson Quadrangle (219-SW). This stream is a tributary to Town Creek. Its headwaters begin west of Bald Knob on Forge Mountain in Johnson County, Tennessee.

Ownership Pattern: The entire 8.5 km (5.3 mi) of stream is on private land. The upper mountainous portion of the stream is on Virginia Development Corporation land.

Elevation:
Mouth - 725 m (2,380 ft)
Head - 1,109 m (3,640 ft)

Aspect: Southwest

Stream Size: (Determined in September 1978 at 847 m - 2,780 ft elevation):
Width - 2.7 m (9.0 ft)
Depth - 8.9 cm (3.5 in)

Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.07 (2.4 CFS)
Water Level Conditions - low

Percent Grade: 4.5%

Barriers: No falls, but the stream runs into the substrate below 847 m (2,780 ft) elevation and near the highway.

Water Quality: (Determined 16 June 1969 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 9 ppm
Hardness - 34 ppm
M.O. Alkalinity - 17 ppm
Temperature - 17°C (62°F)

(Determined 8 September 1978 at 847 m - 2,780 ft elevation):
Siltation - light

Sources of Pollution: Not Recorded

Other Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)
Fantail darter (Etheostoma flabellare)

Fish Collected: September 1978 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 24
Number of Rainbow Trout Less Than 100 mm: 36

28 June 1984 by Bivens
Rainbow Trout Average Length: 165.5 mm (6.5 in)
Rainbow Trout Average Weight: 58.3 g (2.1 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.29
Number of Rainbow Trout Greater Than 100 mm: 4
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: There is an overall mixture of pools and riffles of about 45%. Riffle areas make up approximately 65% of the stream while about 25% is made up of pools, no flats, and the remaining 10% is in cascades or bedrock areas. The stream bottom is composed mostly of gravel and small and large rubble, with some bedrock. Pool development is not very good and many sections are shallow. Siltation is light.

Vegetative Conditions: The local watershed is about 50% timber, 30% pasture, 10% cultivation, and 10% urban. Shade or forest canopy is good over about 75% of the stream. The headwater section has about 80% of overstory and understory vegetation

made up predominantly of yellow poplar (Liriodendron tulipifera), birch (Betula spp.), and rhododendron (Rhododendron spp.). Approximately 5% has only rhododendron understory and about 15% is open farm land.

Discussion: This stream was listed by Tatum (1968) as having brook trout. The TWRA (1969b) stream survey report also listed brook trout along with rainbow trout as the primary species present in Furnace Creek. However, Elsen (1978) found only rainbow trout present. He stated that the stream has good water quality and a naturally reproducing population of rainbow trout. Bivens (1984) also found only rainbow trout present in the headwaters. This stream probably has no future potential for brook trout management due to the well established rainbow trout population and the ownership status of the stream.

174 Corn Creek

Map Location: Mountain City Quadrangle (214-NE) and Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Goose Creek. Its headwaters begin on the southeast side of the Iron Mountains south of Grindstone Ridge. It is located in Johnson County, Tennessee.

Ownership Pattern: The lower 4.3 km (2.7 mi) of stream is on private land, and the remaining 2.7 km (1.7 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 737 m (2,418 ft)
Head - 1,207 m (3,960 ft)

Aspect: Southeast

Stream Size: (Determined 26 June 1984 at 852 m - 2,795 ft elevation):
Width - 2.0 m (6.7 ft)
Depth - 10.4 cm (4.1 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.08 (2.7 CFS)
Water Level Conditions - normal

Percent Grade: 6.6%

Barriers: None

Water Quality: (Determined 16 June 1969 by TWRA stream survey):
pH - 6.0
Dissolved Oxygen - 8 ppm

Hardness - 34 ppm
M.O. Alkalinity - 17 ppm
Temperature - 18°C (65°F)

(Determined 26 June 1984 at 852 m - 2,795 ft elevation):
pH - 7.3
Total Hardness - 8 ppm
Temperature - 13°C (56°F)
Siltation - light

Sources of Pollution: Not Recorded

Other Species Present:
Banded sculpin (Cottus carolinae)
Blacknose dace (Rhinichthys atratulus)
Central stoneroller (Campostoma anomalum) - lower stream only
Fantail darter (Etheostoma flabellare) - lower stream only
Mayflies (Ephemeroptera)
Crayfish
Salamanders
Snails

Fish Collected: 26 June 1984 by Bivens
Brook Trout Average Length: 147.3 mm (5.8 in)
Brook Trout Average Weight: 38.1 g (1.4 oz)
Average K Brook Trout Greater Than 100 mm: 1.19
Number of Brook Trout Greater Than 100 mm: 8
Number of Brook Trout Less Than 100 mm: 14

Stream Conditions: The stream is fairly small and is mostly riffle areas with several good pools. Cover for fish is fairly good. The stream bottom is composed primarily of sand, fine gravel, and rubble with rocks and boulders. Overall stream gradient is moderate. Siltation is light.

Vegetative Conditions: The local watershed has about 40% timber, 50% pasture, and 10% cultivation. The section of the stream where brook trout were found has 100% overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), yellow birch (Betula alleghaniensis), maples (Acer spp.), mountain laurel (Kalmia latifolia), wild hydrangea (Hydrangea arborescens), and rhododendron (Rhododendron spp.). Rhododendron is thick along the streambank.

Discussion: The TWRA (1969b) stream survey report listed brook trout as the primary species present in Corn Creek. Bivens (1984) found brook trout still present in the upper portion of the stream. Brook trout were found from about 850 m

(2,790 ft) elevation up to 1,006 m (3,300 ft) elevation. The stream has approximately 1.8 km (1.1 mi) of allopatric brook trout water. Although the stream is fairly small, good stream conditions exist and there is a healthy brook trout population. Therefore, no management other than protection of the stream is suggested.

175 Cress Branch

Map Location: Mountain City Quadrangle (214-NE) and Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Corn Creek. Its headwaters begin on the southeast side of the Iron Mountains south of Grindstone Ridge. It is located in Johnson County, Tennessee.

Ownership Pattern: The entire 1.8 km (1.1 mi) of stream is on Forest Service land.

Elevation:
Mouth - 869 m (2,850 ft)
Head - 1,122 m (3,680 ft)

Aspect: Southeast

Stream Size: (Determined 26 June 1984 near the mouth at 869 m - 2,859 ft elevation):
Width Varies - 1.2 to 2.1 m (4.0 to 7.0 ft)

Percent Grade: 14.3%

Barriers: None

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present:
Salamanders
Crayfish

Fish Collected: June 1984 by Bivens
Brook Trout Average Length: 137.6 mm (5.4 in)
Brook Trout Average Weight: 32.6 g (1.2 oz)
Average K Brook Trout Greater Than 100 mm: 1.25
Number of Brook Trout Greater Than 100 mm: 7
Number of Brook Trout Less Than 100 mm: 5

Stream Conditions: The stream is small but it has a pool-riffle ratio of about 50%. The pools are small, but there is fairly good cover for fish. Its bottom is composed primarily of sand, gravel, and rubble along with boulders. The overall stream gradient is moderate.

Vegetative Conditions: The stream has 100% overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), yellow birch (Betula alleghaniensis), maple (Acer spp.), mountain laurel (Kalmia latifolia), wild hydrangea (Hydrangea arborescens), and rhododendron (Rhododendron spp.). Most of the stream is tangled with rhododendron.

Discussion: Bivens (1984) found brook trout present in Cress Branch. It has not been previously listed as having brook trout. Brook trout were found from the mouth at 869 m (2,850 ft) elevation up to just above the forks at about 939 m (3,080 ft) elevation. The stream has approximately 1.0 km (0.6 mi) of allopatric brook trout water. Although the stream is small, fairly good stream conditions exist and there appears to be a healthy population of brook trout. Therefore, no management is suggested other than protection of the resource.

176 Payne Hollow

Map Location: Baldwin Gap Quadrangle (220-NW) and Mountain City Quadrangle (214-NE). This stream is a tributary to Forge Creek which is a tributary to Roan Creek. Its headwaters begin on the southeast side of Forge Mountain. It is located in Johnson County, Tennessee.

Ownership Pattern: The entire 3.2 km (2.0 mi) of stream is now on private land belonging to the Virginia Development Corporation. Until recently, it was owned by the Forest Service.

Aspect: Southwest

Stream Size: (Determined in September 1978 at 853 m - 2,800 ft elevation):
Width - 1.5 m (5.0 ft)
Depth - 12.7 cm (5.0 ft)
Velocity - 0.3 meter per second (0.9 foot per second)
Cubic Meters Per Second - 0.05 (1.8 CFS)
Water Level Conditions - low

Percent Grade: 11.2%

Barriers: None

Water Quality: (Determined in 1978 at 853 m - 2,800 ft elevation):
pH - 7.0
Siltation - very heavy

Sources of Pollution: Siltation from eroding road which parallels the stream.

Other Species Present: None Recorded

Fish Collected: September 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 23
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: There is an overall mixture of pools and riffles of about 30%. Riffle areas make up approximately 65% of the stream while about 15% is made up of pools, no flats, and the remaining 15% is in cascades or bedrock areas. The stream bottom is composed of small rubble, gravel, and bedrock. Siltation is very heavy, smothering riffles and filling in pools.

Vegetative Conditions: The streambank has approximately 65% of overstory and understory vegetation made up primarily of yellow poplar (Liriodendron tulipifera), and rhododendron (Rhododendron spp.). About 5% of the stream has only understory vegetation, predominantly rhododendron. The stream has approximately 30% of the streambank with no overstory and little or no shade providing understory. About 25% of the stream has bare and actively eroding banks.

Discussion: Tatum (1968) listed this stream as having a healthy brook trout population. However, Elsen (1978) found brook trout present in Payne Hollow but described it as having only a remnant population. He stated that the stream has been damaged by siltation, loss of streamside vegetation, and physical changes due to logging and road building. A timber road comes from the northwest and runs along close to the stream, here, large trees have been felled in the stream, there is very little shade, and the stream bottom has been layered with red siltation. Below this damaged area, only 23 adult brook trout were collected. These apparently did not successfully reproduce as no y-o-y were collected. It is very doubtful that the brook trout will survive in this stream, and since it is on private land, it probably no longer

has future potential for brook trout management. If the damage could be reversed however, Payne Hollow could be a good, wild brook trout stream.

177 Row Branch

Map Location: Watauga Dam Quadrangle (207-SE). This stream is a tributary to Black Branch which is a tributary to Elk River (Watauga Reservoir). Its headwaters begin on Little Pond Mountain just east of Plot Gap in Carter County, Tennessee.

Ownership Pattern: The lower 1.8 km (1.1 mi) of stream is on private land, and the remaining 2.4 km (1.5 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 610 m (2,000 ft)
Head - 924 m (3,030 ft)

Aspect: East

Stream Size: (Determined in August 1978 at 707 M - 2,320 ft) elevation):
Width - 1.8 m (6.0 ft)
Depth - 10.2 cm (4.0 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.06 (2.0 CFS)
Water Level Conditions - moderately low

Percent Grade: 7.5%

Barriers: 1. Falls; approximately 3.7 m (12.0 ft) vertical height; at about 762 m (2,500 ft) elevation.

Water Quality: (Determined 30 June 1968 by TWRA stream survey):
pH - 7.2
Dissolved Oxygen - 9 ppm
Hardness - 34 ppm
M.O. Alkalinity - 34 ppm
Temperature - 18°C (65°F)

Sources of Pollution: None

Other Species Present:
Blacknose dace (*Rhinichthys atratulus*)
Salamanders, aquatic insects, and crayfish

Stream Conditions: On Forest Service land there is an overall mixture of pools and riffles of about 15%. Riffle areas make up approximately 65% of the stream, while about 10% is made up of pools, 20% in flats, and the remaining 5% is in cascades or bedrock areas. The stream bottom is composed of small rubble and sand. It is generally shallow and siltation is light.

Vegetative Conditions: The streambank has approximately 90% of overstory and understory vegetation made up predominantly of oak (Quercus spp.), birch (Betula spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.). About 6% of the stream (on private land) has understory vegetation (primarily rhododendron) but no overstory vegetation, and approximately 4% of the private land section has no overstory and little or no shade providing understory.

Discussion: Tatum (1968) listed this stream as having brook trout. He stated that the population was very low at that time and concluded this was due to erosion caused by forest fires and logging. The TWRA (1968a) stream survey report listed only rainbow trout as the primary species present. However, Elsen (1978) found no trout species present on the Forest Service section of the stream. He stated that although the stream now has good water quality, it has apparently lost its wild trout populations. It is overall, small and shallow and maybe just marginal for trout habitat.

178 Heaton Branch

Map Location: Elk Mills Quadrangle (214-SW) and Watauga Dam Quadrangle (207-SE). This stream is a tributary to the Elk River. Its headwaters begin on the east side of Walnut Mountain just south of Rich Gap in Carter County, Tennessee.

Ownership Pattern: Land ownership is disjointed, with about 5.0 km (3.1 mi) of the stream on private land, and about 1.6 km (1.0 mi) of stream on Forest Service land.

Elevation:
Mouth - 620 m (2,035 ft)
Head - 1,049 m (3,440 ft)

Aspect: East

Stream Size: (Determined in September 1978 at 658 m - 2,160 ft elevation):
Width - 2.4 m (8.0 ft)
Depth - 15.2 cm (6.0 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.14 (4.8 CFS)
Water Level Conditions - normal

Percent Grade: 6.5%

Barriers: None

Water Quality: (Determined 26 June 1968 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 8 ppm
Hardness - 17 ppm
M.O. Alkalinity - 34 ppm
Temperature - 19°C (67°F)

Sources of Pollution: Siltation from adjacent road.

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)
River chub (Nocomis micropogon)
Fantail darter (Etheostoma flabellare)
Northern hog sucker (Hypentelium nigricans)

Fish Collected: September 1978 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 5
Number of Rainbow Trout Less Than 100 mm: 37

Stream Conditions: On Forest Service land there is an overall mixture of pools and riffles of about 20%. Riffle areas make up approximately 40% of the stream, while about 15% is made up of pools, 40% in flats, and the remaining 5% is in cascades or bedrock areas. The stream bottom is composed of large and small rubble, gravel, and some bedrock. The stream is mostly riffle areas with only a few good pools. Siltation is medium heavy.

Vegetative Conditions: The streambank has approximately 85% of overstory and understory vegetation made up predominantly of cove hardwoods and rhododendron (Rhododendron spp.). About 10% of the stream has only understory vegetation that is mainly rhododendron and 5% of the streambank (private land) has no overstory and little or no shade providing understory. There are some areas on private land with bare or actively eroding banks.

Discussion: Tatum (1968) listed this stream as having brook trout. He stated that the population was very low at that time and concluded this was due to erosion caused by forest fires and logging. The TWRA (1968a) stream survey report listed only rainbow trout as the primary species present. The Forest Service survey (Elsen 1978) found only rainbow trout present in Heaton Branch. The stream has poor pool development, siltation, and an established wild population of rainbow trout. Therefore, it probably no longer has any potential for brook trout management.

179 Little Laurel Branch

Map Location: Elk Mills Quadrangle (214-SW), White Rocks Mountain Quadrangle (208-NE), and Elk Park Quadrangle (215-NW). This stream is a tributary to the Elk River. Its headwaters begin on the north side of Big Pine Mountain west of Flint Ridge. It is located in the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The entire 4.0 km (2.5 mi) of stream is on Forest Service land.

Elevation:
Mouth - 628 m (2,060 ft)
Head - 1,030 m (3,380 ft)

Aspect: North

Stream Size: (Determined 28 June 1984 at the mouth, at 628 m - 2,060 ft) elevation:
Width - 3.7 m (12.0 ft)
Depth - 18.8 cm (7.4 in)
Velocity - 0.6 meter per second (2.0 feet per second)
Cubic Meters Per Second - 0.35 (11.8 CFS)
Water Level Conditions - normal

Percent Grade: 10.0%

Barriers:
1. Falls; approximately 2.7 m (9.0 ft) vertical height; at about 640 m (2,100 ft) elevation.
2. Falls; approximately 4.5 m (15.0 ft) vertical height; at about 744 m (2,440 ft) elevation.
3. Falls; approximately 8.2 m (27.0 ft) vertical height; (2,560 ft) elevation.

Water Quality: (Determined 30 June 1968 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 8 ppm
Hardness - 17 ppm
M.O. Alkalinity - 17 ppm
Temperature - 18°C (64°F)

(Determined 28 June 1984 at 628 m - 2,060 ft elevation):
pH - 7.3
Total Hardness - 7 ppm
Temperature - 16°C (60°F)

Sources of Pollution: Not Recorded

Other Species Present:
Rainbow trout (Salmo gairdneri) - below barrier falls
Blacknose dace (Rhinichthys atratulus)
Crayfish
Salamanders

Fish Collected: June 1984 by Bivens
Brook Trout Average Length: 167.9 mm (6.6 in)
Brook Trout Average Weight: 61.0 g (2.2 oz)
Average K Brook Trout Greater Than 100 mm: 1.29
Number of Brook Trout Greater Than 100 mm: 8
Number of Brook Trout Less Than 100 mm: 8
Rainbow Trout Average Length: 158.0 mm (6.2 in)
Rainbow Trout Average Weight: 48.0 g (1.7 oz)
Average K Rainbow Trout Greater Than 100 mm: 1.22
Number of Rainbow Trout Greater Than 100 mm: 4
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: The stream has a pool-riffle ratio of about 50%. Riffle areas are deep and wide and there are many deep pools. Lots of bedrock areas occur but they usually terminate in good pools. Good cover exists for fish. Streambed composition is primarily sand, fine gravel, and rubble with many rocks and large boulders. The overall stream gradient is moderate.

Vegetative Conditions: The streambank has 100% overstory and understory vegetation made up predominantly of yellow birch (Betula alleghaniensis), hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), maple (Acer spp.), flowering dogwood (Cornus florida), witch hazel (Hammelis virginiana), and rhododendron (Rhododendron spp.). The stream is fairly open.

Discussion: The TWRA (1968a) stream survey report listed brook trout as the primary species present in Little Laurel Branch. Bivens (1984) found brook trout still present in the stream along with a few rainbow trout. Brook trout were found from the mouth at 628 m (2,060 ft) elevation up to about 817 m (2,680 ft) elevation. The stream has about 0.2 km (0.1 mi) of sympatric brook/rainbow trout from the mouth up to a natural falls that acts as a barrier to upstream movement by rainbow trout. Above this falls is approximately 1.6 km (1.0 mi) of allopatric brook trout water.

This stream has good to excellent stream conditions along with a healthy brook trout population that is protected by a natural barrier. Therefore, no management is suggested other than protection of the watershed and the brook trout resource.

180 Morgan Branch

Map Location: White Rocks Mountain Quadrangle (208-NE). This stream is a tributary to Little Laurel Branch. Its headwaters begin on the south side of Fork Ridge in the Cherokee Wildlife Area in Carter County, Tennessee.

Ownership Pattern: The entire 2.6 km (1.6 mi) of stream is on Forest Service land.

Elevation:
Mouth - 792 m (2,600 ft)
Head - 1,049 m (3,440 ft)

Aspect: Northeast

Stream Size: (Determined 9 July 1984 at the mouth, at 792 m - 2,600 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 10.9 cm (4.3 in)
Velocity - 0.5 meter per second (1.5 foot per second)
Cubic Meters Per Second - 0.08 (2.6 CFS)
Water Level Conditions - normal

Percent Grade: 9.9%

Barriers: None

Water Quality: (Determined 9 July 1984 at 792 m - 2,600 ft elevation):
pH - 7.3
Total Hardness - 5 ppm
Temperature - 14°C (58°F)
Siltation - medium

Sources of Pollution: Not Recorded

Other Species Present: Crayfish

Fish Collected: June and July 1984 by Bivens
Brook Trout Average Length: 142.4 mm (5.6 in)
Brook Trout Average Weight: 33.0 g (1.2 oz)
Average K Brook Trout Greater Than 100 mm: 1.14
Number of Brook Trout Greater Than 100 mm: 11
Number of Brook Trout Less Than 100 mm: 0

Stream Conditions: Riffle areas make up approximately 60% of the stream, while about 30% is made up of pools, 5% in flats, and the remaining 5% is in cascades or bedroom areas. Overall it is a small stream with fair cover for fish. The stream bottom is composed of sand, gravel, rubble, rocks and boulders. For the most part, the stream is fairly low gradient. Siltation is medium but the riffle areas are clean.

Vegetative Conditions: The streambank has 100% overstory and understory vegetation made up predominantly of yellow birch (Betula alleghaniensis), hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), maples (Acer spp.), flowering dogwood (Cornus florida), witch hazel (Hamamelis virginiana), and rhododendron (Rhododendron spp.). Rhododendron is thick along the stream and the upper reaches become almost impassable.

Discussion: Bivens (1984) found brook trout present in this stream. It has not been previously listed as having brook trout. Brook trout were found from the mouth at 792 m (2,600 ft) elevation up to about 914 m (3,000 ft) elevation on the left-hand fork and the stream has approximately 1.3 km (0.8 mi) of allopatric brook trout water.

Although the stream is small, fair stream conditions and cover for fish exists and the stream has a healthy brook trout population. Also, the stream is protected from encroachment of other trout species by three barrier falls located on Little Laurel Branch. Therefore, no management is suggested other than protection of the watershed.

181 Fishdam Creek

Map Location: Holston valley Quadrangle (206-SE) and Carter Quadrangle (207-NE). This stream is a tributary to the South Fork Holston River (South Holston Reservoir). Its headwaters begin on the northwest side of Holston Mountain about 3.5 km (2.2 mi) northeast of Flint Mill Gap. It is located within

the Cherokee Wildlife Area in Sullivan County, Tennessee.

Ownership Pattern: The entire 5.5 km (3.4 mi) of stream is on Forest Service land.

Elevation:
Mouth (South Holston Reservoir) - 527 m (1,729 ft)
Head - 1,109 m (3,640 ft)

Aspect: Northwest

Stream Size: (Determined in May 1978 at 544 m - 1,785 ft elevation):
Width - 2.1 m (7.0 ft)
Depth - 17.8 cm (7.0 in)
Velocity - 0.3 meter per second (1.1 foot per second)
Cubic Meters Per Second - 0.12 (4.1 CFS)

Water Level Conditions: normal to moderately high

Percent Grade: 10.6%

Barriers: None

Water Quality: (Determined 3 October 1967 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 34 ppm
Temperature - 13°C (56°F)

Sources of Pollution: Some siltation from old roads.

Other Species Present:
Rainbow trout (*Salmo gairdneri*)
Logperch (*Percina caprodes*)
Blacknose dace (*Rhinichthys atratulus*)
Aquatic insects and crayfish.

Fish Collected: May 1978 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 44
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: There is an overall mixture of pools and riffles of about 65%. Riffle areas make up approximately 55% of the stream, while about 30% is made up of pools, no flats, and the remaining 15% is in cascades or bedrock areas. The stream bottom is composed of large and small rubble, gravel, rocks, and boulders. There is fairly good pool development, and siltation is slight.

Vegetative Conditions: The streambank has approximately 97% overstory and understory vegetation made up predominantly of birch (Betula spp.), yellow poplar (Liriodendron tulipifera), hemlock (Tsuga canadensis), oak (Quercus spp.), and rhododendron (Rhododendron spp.).

Discussion: The TWRA (1967) stream survey report listed brook trout along with rainbow trout as the primary species present in Fishdam Creek. Tatum (1969) also listed the stream as having a brook trout population. However, a recent Forest Service survey (Elsen 1978) found no brook trout present. It has excellent water quality and a well established, reproducing rainbow trout population. Therefore, it probably has no future potential for brook trout management.

One interesting note on Fishdam Creek; a rearing trough was installed at the reservoir (South Holston) in the early 1970's. This was used to imprint young coho salmon (Oncorhynchus kisutch) in an attempt to establish a salmon run from South Holston Reservoir. To date, there have been no returns. This rearing trough was built and used by the Tennessee Wildlife Resources Agency.

182 Big Jacob Creek (Jacob Creek)

Map Location: Shady Valley Quadrangle (213-SW). This stream is a tributary to the South Fork Holston River (South Holston Reservoir). Its headwaters begin on the northwest side of Holston Mountain near Pine Mountain Gap. It is located within the Cherokee Wildlife Area in Sullivan County, Tennessee.

Ownership Pattern: The lower 2.3 km (1.4 mi) of stream is on private land, and the remaining 4.5 km (2.8 mi) of stream is on Forest Service land.

Elevation:
Mouth (South Holston Reservoir) - 527 m (1,729 ft)
Head - 1,000 m (3,280 ft)

Aspect: Northwest

Stream Size: (Determined in May 1978 at about 573 m - 1,880 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 15.2 cm (6.0 in)
Velocity - 0.4 meter per second (1.3 foot per second)
Cubic Meters Per Second - 0.11 (3.8 CFS)
Water Level Conditions - normal to moderately high

Percent Grade: 7.0%

Barriers: None

Water Quality: (Determined 27 September 1967 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 9 ppm
Hardness - 34 ppm
M.O. Alkalinity - 68 ppm
Temperature - 18°C (65°C)
Siltation - light

Sources of Pollution: None

Other Species Present:
Rainbow trout (Salmo gairdneri)
Creek chub (Semotilus atromaculatus) - lower section only
Blacknose dace (Rhinichthys atratulus)
Fantail darter (Etheostoma flabellare) - lower section only
Crayfish, salamanders, and aquatic insects.

Fish Collected: May 1978 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 78
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: There is an overall mixture of pools and riffles of about 80%. Riffle areas make up approximately 50% of the stream, while about 40% is made up of pools, no flats, and the remaining 10% is in cascades or bedrock areas. The stream bottom is composed of large and small rubble, gravel, and some bedrock. Most of the better pools are in the higher gradient section of the stream. Siltation is slight.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), oak (Quercus spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.).

Discussion: Big Jacob Creek was used as a study stream to evaluate efforts of stocking indigenous, southern strain, hatchery reared brook trout by the TWRA in the mid-1950's. Roaring Branch on the Tellico Wildlife Management Area in Monroe County was also used.

Progeny of brood stock originally taken from streams on the Pisgah National Forest in North Carolina were supplied by the Walhalla National Hatchery in South Carolina beginning in 1955. Big Jacob Creek had a history of fire damage in the mid-1920's that had left it devoid of fish, but the stream had recovered to provide good water quality and trout habitat conditions. It was stocked with 300 Pisgah fingerlings, 76.2 to 101.6 mm (3.0 to 4.0 in), brook trout in August 1955.

Limited natural reporduction was reported in the fall of 1955 and a successful spawn in 1956 was recorded as the first progeny from hatchery origin brook trout in Tennessee. A supplemental stocking of 300 Pisgah strain, 228.6 mm (9.0 in), in March, 1956 plus the survivors from the original release progressed to a climax population. A stable population still existed in Big Jacob Creek in late 1961 (Wilkins 1961).

Tatum (1968) listed this stream as having brook trout in the headwaters. However, Elsen (1978) found no brook trout present. He stated that the stream has excellent water quality and a well established, reproducing rainbow trout population. Therefore, it probably has no future potential for brook trout management.

183 Little Jacob Creek

Map Location: Holston Valley Quadrangle (206-SE) and Shady Valley Quadrangle (213-SW). This stream is a tributary to the South Fork Holston River (South Holston Reservoir). Its headwaters begin on the northwest side of Holston Mountain near Low Gap. It is located within the Cherokee Wildlife Area in Sullivan County, Tennessee.

Ownership Pattern: The lower 0.2 km (0.1 mi) of stream is on private land, but the remaining 6.3 km (3.9 mi) of stream is on Forest Service land.

Elevation:
Mouth (South Holston Revervoir) - 527 m (1,729 ft)
Head - 1,024 m (3,360 ft)

Aspect: Northwest

Stream Size: (Determined 15 Spetember 1978 at 646 m - 2,120 ft elevation):
Width - 2.7 m (9.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.5 meter per second (1.7 foot per second)
Cubic Meters Per Second - 0.15 (5.1 CFS)
Water Level Conditions - moderately low to normal

Percent Grade: 7.7%

Barriers: No absolute barriers, but some smaller falls; locations not recorded.

Water Quality: (Determined 27 September 1967 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 9 ppm

Hardness - 24 ppm
M.O. Alkalinity - 68 ppm
Temperature - 14°C (57°F)

Sources of Pollution: Not Recorded

Other Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)
River chub (Nocomis micropogon)
Sculpin (Cottus spp.)
Crayfish
Salamanders

Fish Collected: 15 September 1978 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 29
Number of Rainbow Trout Less Than 100 mm: 49

Stream Conditions: The stream has a pool-riffle ratio of about 85%. Riffle areas make up approximately 55% of the stream, while about 40% is in pools, no flats, and the remaining 5% is in cascades or bedrock areas. There are good pools where the gradient is high, and generally, good trout habitat. The stream bottom is primarily gravel, rubble, and bedrock. Siltation is light.

Vegetative Conditions: The streambank has approximately 99% overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), birch (Betula spp.), and rhododendron (Rhododendron spp.). About 1% of the streambank has understory vegetation but no overstory vegetation.

Discussion: The TWRA (1967) stream survey report listed brook trout as the primary species present in Little Jacob Creek. However, Elsen (1978) found only rainbow trout present in the stream. He reported that the stream has excellent water quality and supports an allopatric, stream reproducing rainbow trout population. This stream probably has no future management potential for brook trout and it should remain as a wild rainbow trout stream.

184 Unnamed Tributary (To Harpers Creek)

Map Location: Shady Valley Quadrangle (213-SW). This stream is a tributary to Harpers Creek that has no name on the quadrangle map. Its headwaters begin on the west side of Little Pine Mountain and it enters Harpers Creek at about 610 m (2,000 ft) elevation. It is located in the Cherokee Wildlife Area in Sullivan County, Tennessee.

Ownership Pattern: About 0.2 km (0.1 mi) of stream at the mouth is on private land, and the remaining 1.8 km (1.1 mi) of stream is on Forest Service land.

Elevation:
Mouth - 608 m (1,995 ft)
Head - 853 m (2,800 ft)

Aspect: Northwest

Stream Size:
Average Width - 1.5 m (5.0 ft)
Width Varies - 0.6 to 2.7 m (2.0 to 9.0 ft)
Average Pool Depth - 22.9 cm (9.0 in)
Average Riffle Depth - 7.6 cm (3.0 in)

Percent Grade: 12.7%

Barriers: Not Recorded

Water Quality: (Determined 27 September 1967 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 8 ppm
Hardness - 34 ppm
M.O. Alkalinity - 68 ppm
Temperature - 18°C (64°F)

Sources of Pollution: Not Recorded

Other Species Present:
Blacknose dace (Rhinichthys atratulus)
Crayfish
Salamanders

Stream Conditions: Very small stream with very few small pools and not much cover for fish. The stream bottom is composed primarily of sand and rubble with larger rocks.

Vegetative Conditions: The streambank has 100% overstory and understory vegetation made up primarily of yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), maples (Acer spp.), flowering dogwood (Cornus florida), and rhododendron (Rhododendron spp.).

Discussion: The TWRA (1967) stream survey report listed this stream as having "isolated" brook trout. Bivens (1984) found no trout species present. The stream is very small, without much cover for fish, and probably has no trout management potential due to its small size.

185 Unnamed Tributary (To Big Jacob Creek)

Map Location: Shady Valley Quadrangle (213-SW). This stream is a tributary to Big Jacob Creek that has no name on the quadrangle map. Its headwaters begin on the northwest side of Pine Mountain and it enters Big Jacob Creek at about 582 m (1,910 ft) elevation. It is located in the Cherokee Wildlife Area in Sullivan County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on Forest Service land.

Elevation:
Mouth - 582 m (1,910 ft)
Head - 750 m (2,460 ft)

Aspect: Northwest

Stream Size: (Determined 23 May 1984 at 591 m - 1,940 ft elevation):
Width - 2.0 m (6.7 ft)
Approximate Depth - 10.2 cm (4.0 in)

Percent Grade: 8.0%

Barriers: Not Recorded

Water Quality: (Determined 27 September 1967 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 9 ppm
Hardness - 34 ppm
M.O. Alkalinity - 68 ppm
Temperature - 18°C (65°F)

Sources of Pollution: Not Recorded

Other Species Present:
Blacknose dace (Rhinichthys atratulus)
Creek chub (Semotilus atromaculatus)
Stoneflies (Plecoptera)
Crayfish
Snails

Stream Conditions: The stream is small and is mostly riffles with very few shallow pools. It does not provide much cover for fish. The bottom is composed of lots of sand and gravel, with rubble and rocks. Siltation is medium to heavy.

Vegetative Conditions: The streambank has 100% overstory and understory vegetation made up predominantly of yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), maples (Acer spp.), flowering dogwood (Cornus florida), and rhododendron (Rhododendron spp.).

Discussion: The TWRA (1967) stream survey report listed this stream as having "rare" brook trout. Bivens (1984) found no trout species present. The stream is small, without much cover for fish, and probably has no trout management potential due to its small size.

186 Rockhouse Run (Headwaters)

Map Location: Abingdon Quadrangle (213-NW) and Shady Valley Quadrangle (213-SW). This stream is a tributary to South Fork Holston River. Its headwaters begin on the south side of Harp Mountain in Johnson County, Tennessee, and runs north into Washington County, Virginia.

Ownership Pattern: Total length of the stream is 8.8 km (5.5 mi), but 5.0 km (3.1 mi) of the upper stream is in Tennessee. Out of the Tennessee portion, the lower 1.1 km (0.7 mi) of stream is on private land, and the remaining 3.9 km (2.4 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 533 m (1,750 ft)
Head - 1,480 m (3,480 ft)

Aspect: North

Stream Size: Not Recorded

Percent Grade: 6.0%

Barriers: 1. Stream sinks below large rubble size rocks near the the Forest Service boundary line at about 762 m (2,500 ft) elevation.

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: Rockhouse Run had a thriving native brook trout population in 1978. It is a pretty stream that is about 1.8 m (6.0 ft) wide and up to 0.9 m (3.0 ft) deep while on Forest Service land. At private land, it sinks into large rubble sized rocks. This dry stretch apparently acts as a barrier, as no rainbow trout were present above it. Approximately 2.3 km (1.4 mi) of stream on Forest Service land is estimated to have brook trout present (Elsen, personal communication).

187 Reservoir Branch

Map Location: Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the northwest side of Iron Mountain in Johnson County, Tennessee.

Ownership Pattern: The lower 0.6 km (0.4 mi) of stream is on private land, and the upper 2.7 km (1.7 mi) of stream is on Forest Service land.

Elevation:
Mouth - 632 m (2,075 ft)
Head - 1,024 m (3,360 ft)

Aspect: Northwest

Stream Size: (Determined in September 1978 at 695 m - 2,280 ft elevation):
Width - 2.1 m (7.0 ft)
Depth - 14.0 cm (5.5 in)
Velocity - 0.3 meter per second (0.9 foot per second)
Cubic Meters Per Second - 0.09 (3.1 CFS)
Water Level Conditions - low

Percent Grade: 7.9%

Barriers: Several small falls probably restrict upstream movement.

Water Quality: (Determined 11 June 1969 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 8 ppm
Hardness - 17 ppm
M.O. Alkalinity - 40 ppm
Temperature - 17°C (62°F)

(Determined in September 1978 at 695 m - 2,280 ft elevation):
pH - 6.9
Conductivity - 20 umhos/cm
Siltation - light

Sources of Pollution: None on Forest Service land. Siltation from the old reservoir, roads and private land in the lower stream.

Other Species Present:
No fish species collected.
Salamanders and crayfish.

Stream Conditions: There is an overall mixture of pools and riffles of about 75%. Riffle areas make up approximately 30% of the stream while about 35% is made up of pools, no flats, and the remaining 35% is in cascades or bedrock areas. The stream bottom is composed of rubble and gravel with bedrock in the upper reaches. Some nice pools occur in the area where the gradient becomes steeper. Siltation is light on the Forest Service land but in heavier on private land.

Vegetative Conditions: The streambank has approximately 80% of overstory and understory vegetation made up predominantly of cove hardwoods, yellow poplar (Liriodendron tulipifera), birch (Betula spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.). About 20% of the streambank has no overstory on the private land section.

Discussion: This stream had no trout present (Elsen 1978) nor was it listed previously as being a brook trout stream (TWRA 1969b). It is only mentioned here because it has some potential for brook trout management. Water quality appears to be excellent on the Forest Service part of the stream, and it is scheduled to receive native brook trout transplants in the summer of 1984 (Elsen, personal communication).

188 Tank Hollow

Map Location: Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the northwest side of Iron Mountain just north of Morfield Ridge in Johnson County, Tennessee.

Ownership Pattern: The entire 3.5 km (2.2 mi) of stream is on Forest Service land.

Elevation:
Mouth - 663 m (2,175 ft)
Head - 1,026 m (3,365 ft)

Aspect: Northwest

Stream Size: (Determined in September 1978 at 668 m - 2,190 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.2 meter per second (0.8 foot per second)
Cubic Meters Per Second - 0.09 (2.9 CFS)
Water Level Conditions - moderately low

Percent Grade: 10.3%

Barriers:
1. Man-made rock and mortar barrier at about 683 m (2,240 ft) elevation.
2. Rockslide at about 695 m (2,280 ft) elevation.

Water Quality: (Determined in September 1978 at 671 m - 2,200 ft elevation):
pH - 7.1
Conductivity - 10 umhos/cm
Siltation - light

Sources of Pollution: None

Other Species Present:
Rainbow trout (Salmo gairdneri)
Crayfish and salamanders.

Fish Collected: September 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 26
Number of Brook Trout Less Than 100 mm: 21
Number of Rainbow Trout Greater Than 100 mm: 8
Number of Rainbow Trout Less Than 100 mm: 8

Stream Conditions: There is an overall mixture of pools and riffles of about 55%. Riffle areas make up approximately 45% of the stream while about 25% is made up of pools, 7% in flats, and the remaining 23% is in cascades or bedrock areas. The stream bottom is composed of small and large rubble, gravel, and boulders with bedrock in the upper reaches. Some good pools are formed where water tumbles over bedrock ledges, boulders, and fallen logs. Part of the stream is buried where the Job Corps road pushed rocks into the stream, creating a barrier to fish movement. Siltation is light.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), birch (Betula spp.), and rhododendron (Rhododendron spp).

Discussion: Elsen (1978) found a brook trout population present in this stream. It has not been previously listed as having brook trout. He stated that Tank Hollow appears to have excellent water quality and a native brook trout population with a few rainbow trout near the mouth. Also, he suggested that a barrier should be constructed and rainbow trout be removed, along with building some wedge dams to help create cover.

A rock and mortar barrier was constructed in 1980. In 1982, the barrier was enlarged to create a 1.7 m (5.5 ft) vertical drop, wedge dams were constructed, and 10 rainbow trout were moved below the barrier. Only one rainbow trout was found above the barrier in 1983 and brook trout were found down to the barrier. Removal efforts appear to have almost eliminated rainbow trout from above the barrier (Strange 1983). Occasional checking of the stream may still be necessary.

189 Stillhouse Branch

Map Location: Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the southeast side of Holston Mountain in Johnson County, Tennessee.

Ownership Pattern: The entire 2.4 km (1.5 mi) of stream is on Forest Service land.

Elevation:
Mouth - 671 m (2,200 ft)
Head - 1,036 m (3,400 ft)

Aspect: Southeast

Stream Size: (Determined in May 1981 at 671 - 2,200 ft elevation):
Width - 2.1 m (7.0 ft)
Depth - 10.2 cm (4.0 in)
Velocity - 0.3 meter per second (1.1 foot per second)
Cubic Meters Per Second - 0.08 (2.5 CFS)
Water Level Conditions - low

Percent Grade: 15.2%

Barriers: None

Water Quality: (Determined 12 June 1969 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 34 ppm
Temperature - 15°C (58°F)

(Determined 30 May 1981 at 671 m - 2,200 ft elevation):
Siltation - slight

Sources of Pollution: None

Other Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: May 1981 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 6
Number of Rainbow Trout Less Than 100 mm: 5

Stream Conditions: There is an overall mixture of pools and riffles of about 45%. Riffle areas make up approximately 65% of the stream while about 25% is made up of pools, no flats, and the remaining 10% is in cascades or bedrock areas. The stream bottom is composed of gravel, small and large rubble, and boulders. The best pools are where old logs have fallen across the stream. The stream is very clean and siltation is slight. It does, however, have problems of flashy flows.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), cucumber tree (Magnolia acuminata), and rhododendron (Rhododendron spp).

Discussion: The TWRA (1969b) stream survey report listed brook trout as the primary species present in Stillhouse Branch. However, Elsen (1981) found only rainbow trout present in the stream. He stated that Stillhouse Branch is a small tributary stream that appears to have excellent water quality. It has an allopatric population of rainbow trout and the lower reaches are probably utilized as a spawning area for trout from Beaverdam Creek. Therefore, it probably has no future potential for brook trout management.

190 Chalk Branch (Camp Hollow)

Map Location: Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the northwest side of Iron Mountain in Johnson County, Tennessee.

Ownership Pattern: The entire 3.9 km (2.4 mi) of stream is on Forest Service land.

Elevation:
Mouth - 681 m (2,235 ft)
Head - 991 m (3,250 ft)

Aspect: Northwest

Stream Size: (Determined in August 1978 at 681 m - 2,235 ft elevation):
Width - 2.4 m (8.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.10 (3.3 CFS)
Water Level Conditions - normal

Percent Grade: 8.0%

Barriers: 1. Man-made; located near the mouth.

Water Quality: (Determined 12 June 1969 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 34 ppm
Temperature - 15°C (59°F)

(Determined in July 1978):
pH - 6.2
Dissolved Oxygen - 11 ppm
Conductivity - 9 umhos/cm

Sources of Pollution: Some siltation from the old roadbed.

Other Species Present:
Rainbow trout (*Salmo gairdneri*)
Sculpin (*Cottus* spp.)

Fish Collected: August 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 30
Number of Brook Trout Less Than 100 mm: 12
Number of Rainbow Trout Greater Than 100 mm: 5
Number of Rainbow Trout Less Than 100 mm: 25

Stream Conditions: There is an overall mixture of pools and riffles of about 30%. Riffle areas make up approximately 65% of the stream while about 15% is made up of pools, no flats, and the remaining 20% is in cascades or bedrock areas. The stream bottom is composed of small and large rubble, coarse gravel, and boulders. Boulders and fallen logs help to create a few good pools in the lower half of the stream. Bedrock areas occur from elevation 729 m (2,600 ft) on upstream. Some fine sand is present in the larger pools, and siltation is light. Some areas of the old roadbed have erosion problems.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), birch (Betula spp.), yellow poplar (Liriodendron tulipifera), oak (Quercus spp.), and rhododendron (Rhododendron spp.).

Discussion: Tatum (1968) listed this stream as having brook trout. He stated that the population was very low at that time and concluded this was due to erosion caused by forest fires and logging. The TWRA (1969b) stream survey report listed brook trout as the primary species present. Elsen (1978) found brook trout to still be present in Chalk Branch but described the population as remnant, along with an invading population of rainbow trout. Because it has a native population of brook trout and is a popular brook trout stream with local anglers, he suggested that a barrier be constructed near the mouth and rainbow trout removed.

In 1981, the barrier was constructed along with wedge dams to increase pools and cover. Subsequent rainbow trout removal in that same year removed 600 rainbow trout and transplanted them below the barrier. In 1982, another 135 rainbow trout were removed. Only two y-o-y rainbow trout were found at that time. Another 54 rainbow trout with no y-o-y were removed in 1983. The removal effort has been fairly successful, and the absence of any y-o-y in 1983 may indicate that total elimination of rainbow trout from Chalk Branch may be possible (Strange 1983).

Recent stream improvement and rainbow trout removal from Chalk Branch will help to improve the brook trout fishery and insure its survival. One interesting note; in 1982, 10 brook trout were transported from Gentry Creek and stocked in Chalk Branch in an effort to increase the variability of the gene pool.

191 Maple Branch (Chestnut Branch)

Map Location: Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the northwest side of Iron Mountain in Johnson County, Tennessee.

Ownership Pattern: The entire 3.7 km (2.3 mi) of stream is on Forest Service land.

Elevation:
Mouth - 692 m (2,270 ft)
Head - 1,064 m (3,490 ft)

Aspect: North

Stream Size: (Determined in October 1981 at 692 m - 2,270 ft elevation):
Width - 2.1 m (7.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.2 meter per second (0.8 foot per second)
Cubic Meters Per Second - 0.07 (CFS)
Water Level Conditions - low

Percent Grade: 10.0%

Barriers:
1. Man-made barrier near the mouth.
2. Cascades area at about 853 m (2,800 ft) elevation.

Water Quality: (Determined 12 June 1969 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 40 ppm
Temperature - 14°C (58°F)

(Determined in October 1981 at 692 m - 2,270 ft elevation):
pH - 6.5
Dissolved Oxygen - 12 ppm
Conductivity - 7 umhos/cm
Siltation - slight

Sources of Pollution: None

Other Species Present:
Rainbow trout (*Salmo gairdneri*)
Crayfish and aquatic insects.

Fish Collected: 21 June 1977 by TWRA
Brook Trout Average Length: 122.9 mm (4.8 in)
Brook Trout Average Weight: 16.4 g (0.6 oz)
Average K Brook Trout Greater Than 100 mm: 0.89
Number of Brook Trout Greater Than 100 mm: 9
Number of Brook Trout Less Than 100 mm: 1

October 1981 by Elsen
Number of Brook Trout Greater Than 100 mm: 22
Number of Brook Trout Less Than 100 mm: 0
Number of Rainbow Trout Greater Than 100 mm: 35
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: There is an overall mixture of pools and riffles of about 50%. Riffle areas make up approximately 40% of the stream while about 20% is made up of pools, 10% in flats, and the remaining 30% is in cascades or bedrock areas. The

stream bottom is composed of small and large rubble with some boulders and bedrock. Bedrock, boulders, and fallen logs help to create good pools. Some fine sand and gravel is present in the pools, and siltation is slight. There is some erosion from old roadbed crossings.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), yellow poplar (Liriodendron tulipifera), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.).

Discussion: This stream was listed by the TWRA (1969b) stream survey report as having brook trout along with rainbow trout as the primary species present. Elsen (1981) also found brook trout present along with an invading population of rainbow trout. He suggested at that time that a barrier should be constructed near the mouth and rainbow trout removed to protect the brook trout population.

In 1981, a log barrier was constructed near the mouth of Maple Branch, and 250 rainbow trout were removed. At the same time, some brook trout were moved to above the cascades area. Wedge dams were installed in 1982 to help increase cover for fish and another 93 rainbow trout (20 were y-o-y) and one brown trout (Salmo trutta) were removed. Also in 1982, 10 brook trout from Tank Hollow were transported to Maple Branch. The 1983 removal efforts yeilded 148 rainbows with 53 being y-o-y, over two separate occasions. Strange (1983) stated that decreasing numbers of rainbow trout over the last three years is encouraging, but a continued removal effort is necessary because they still seem to be reproducing.

One other interesting note; brook trout from Maple Branch were used by Harris et al. (1978) of Tennessee Technological University, Tennessee Cooperative Fishery Research Unit in genetic research of brook trout from the Southern Appalachian region and by Konopacky (1978) for age and growth analysis.

192 Haunted Hollow

Map Location: Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the southeast side of Holston Mountain in Johnson County, Tennessee.

Ownership Pattern: The entire 5.6 km (3.5 mi) stream is on Forest Service land.

Elevation:
Mouth - 713 m (2,340 ft)
Head - 1,067 m (3,500 ft)

Aspect: South

Stream Size: (Determined in August 1978 at 713 m - 2,340 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 10.2 cm (4.0 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.06 (2.0 CFS)
Water Level Conditions - low

Percent Grade: 6.3%

Barriers: None

Water Quality: (Determined 12 June 1969 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 34 ppm
Temperature - 15°C (59°F)

Sources of Pollution: None

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Sculpin (Cottus spp.)

Fish Collected: August 1978 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 17
Number of Rainbow Trout Less Than 100 mm: 28

Stream Conditions: There is an overall mixture of pools and riffles of about 25%. Riffle areas make up approximately 40% of the stream, while about 20% is made up of pools, 20% in flats, and the remaining 20% is in cascades or bedrock areas. The stream bottom is composed mostly of large boulders with rubble and gravel. It is mostly shallow riffles and some of the upper portions of the stream sinks into the substrate where the only trout habitat is pools. Siltation is light.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), cove hardwoods, birch (Betula spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.).

Discussion: Tatum (1968) listed this stream as having a healthy brook trout population. The TWRA (1969b) stream survey report also listed brook trout as the primary species present. However, Elsen (1978) found only rainbow trout in the stream. An allopatric rainbow trout population now exists from the mouth to approximately 1.0 km (0.6 mi) above the mouth. Although water quality appears excellent, this stream probably has no future management potential for brook trout due to its overall small size and the firmly established rainbow trout population.

193 Fagall Branch

Map Location: Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the northwest side of Iron Mountain approximately 3.9 km (2.4 mi) northeast of Grindstone Ridge in Johnson County, Tennessee.

Ownership Pattern: A small wedge of private land extends across the stream at about 759 m (2,490 ft) elevation and runs upstream for approximately 0.3 km (0.2 mi). The remaining 4.5 km (2.8 mi) of stream is on Forest Service land.

Elevation:
Mouth - 719 m (2,360 ft)
Head - 1,097 m (3,600 ft)

Aspect: Norhtwest

Stream Size: (Determined in August 1978 at 719 m - 2,360 ft elevation):
Width - 3.0 m (10.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.13 (4.2 CFS)
Water Level Conditions - normal to low

Percent Grade: 7.8%

Barriers:
1. Man-made barrier about 0.2 km (0.1 mi) above the mouth.
2. Falls; about 1.8 m (6.0 ft) vertical height; at about 914 m (3,000 ft) elevation; may serve as a barrier to some extent.

Water Quality: (Determined 12 June 1969 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 9 ppm

Hardness - 17 ppm
M.O. Alkalinity - 40 ppm
Temperature - 14°C (58°F)

(Determined in August 1978 at 719 m - 2,360 ft elevation):
pH - 6.8
Siltation - slight

Sources of Pollution: None

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Brown trout (Salmo trutta)
Sculpin (Cottus spp.)
Fantail darter (Etheostoma flabellare) - near the mouth only.
River chub (Nocomis micropogon) - near the mouth only.
Blacknose dace (Rhinichthys atratulus)

Fish Collected: 21 June 1977 by TWRA
Brook Trout Average Length: 129.5 mm (4.9 in)
Brook Trout Average Weight: 24.3 g (0.9 oz)
Average K Brook Trout Greater Than 100 mm: 1.12
Number of Brook Trout Greater Than 100 mm: 13
Number of Brook Trout Less Than 100 mm: 3

August 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 26
Number of Brook Trout Less Than 100 mm: 42
Number of Rainbow Trout Greater Than 100 mm: 14
Number of Rainbow Trout Less Than 100 mm: 33
Number of Brown Trout Greater Than 100 mm: 10
Number of Brown Trout Less Than 100 mm: 1

Stream Conditions: There is an overall mixture of pools and riffles of about 50%. Riffle areas make up approximately 40% of the stream, while about 30% is made up of pools, 15% in flats, and the remaining 15% is in cascades or bedrock areas. The stream bottom is composed of large and small rubble, along with gravel. Boulders, fallen logs, and bedrock ledges help to create pools and provide cover for fish. Siltation is light.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), birch (Betula spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.).

Discussion: Tatum (1968) listed Fagall Branch as having a healthy brook trout population. The TWRA (1969b) stream survey report

also listed brook trout along with rainbow trout as the primary fish species present. A recent Forest Service survey (Elsen 1978) found about 1.0 km (0.6 mi) of brook trout in the headwaters, and 2.3 km (1.4 mi) of brook and rainbow trout, along with brown trout in the lower section of the stream. It was suggested at that time that a barrier should be constructed near the mouth and the rainbow/brown trout removed to protect the brook trout population.

In 1982, the barrier was constructed along with wedge dams to increase pools and cover, and seven brown and 235 rainbow trout were removed by electroshocking and transported below the barrier. Another 342 rainbow and four brown trout were removed to below the barrier over two separate occasions in 1983. Strange (1983) reported that progress has been made in reducing the number of rainbow trout, but a continued removal effort is necessary as a substantial number still exist well up in the stream.

Fagall Branch is one of the better known brook trout streams by local anglers, and receives a fair amount of fishing pressure. Apparently it has a fairly healthy brook trout population and recent trout removal efforts should help to improve the brook trout fishery as well as insure its survival. One other interesting note; brook trout from Fagall Branch were used by Harris et al. (1978) of Tennessee Technological University, Tennessee Cooperative Fishery Rearch Unit in genetic research of brook trout from the Southern Appalachian region and by Konopacky (1978) for age and growth analysis.

194 Birch Branch

Map Location: Shady Valley Quadrangle (213-SW) and Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the northwest side of Iron Mountain approximately 2.4 km (1.5 mi) northeast of Grindstone Ridge in Johnson County, Tennessee.

Ownership Pattern: The lower 0.8 km (0.5 mi) of the stream is on private land, and the remaining 4.7 km (2.9 mi) of stream is on Forest Service land.

Elevation:
Mouth - 768 m (2,520 ft)
Head - 1,143 m (3,750 ft)

Aspect: Northwest

Stream Size: (Determined in August 1978 at 817 m - 2,680 ft elevation):
Width - 2.4 m (8.0 ft)

Depth - 15.2 cm (6.0 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.14 (4.8 CFS)
Water Level Conditions - moderately low

Percent Grade: 6.9%

Barriers: None

Water Quality: (Determined in 1950 by Shields):
pH - 6.7
Maximum Temperature - 17°C (62°F)

(Determined 12 June 1969 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 34 ppm
Temperature - 14°C (58°F)
Siltation - very light

Sources of Pollution: None

Other Fish Species Present: Rainbow trout (Salmo gairdneri)

Fish Collected: 22 June 1977 by TWRA
Brook Trout Average Length: 112.0 mm (4.4 in)
Brook Trout Average Weight: 16.5 g (0.6 oz)
Average K Brook Trout Greater Than 100 mm: 1.14
Number of Brook Trout Greater Than 100 mm: 17
Number of Brook Trout Less Than 100 mm: 7

August 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 73
Number of Brook Trout Less Than 100 mm: 87
Number of Rainbow Trout Greater Than 100 mm: 15
Number of Rainbow Trout Less Than 100 mm: 17

Stream Conditions: There is an overall mixture of pools and riffles of about 70%. Riffle areas make up approximately 50% of the stream, while about 35% of the stream is made up of pools, no flats, and the remaining 15% is in cascades or bedrock areas. The stream bottom is composed of small and large rubble, gravel with boulders, and bedrock outcrops. Siltation is very light.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), birch (Betula spp.),

hemlock (Tsuga canadensis), cucumber tree (Magnolia acuminata), and rhododendron (Rhododendron spp).

Discussion: Shields (1950) in his survey report of east Tennessee trout streams, stated that the upper portion of Beaverdam Creek supported a fair population of brook trout, with fair reproduction. This probably refers to the tributary streams of Beaverdam Creek, one of which is Birch Branch. He specifically referred to Birch Branch as carrying a maximum load of of trout with good reproduction and he suggested no supplemental stocking of hatchery fish. Birch Branch was also included in Tatum's (1968) list as having a healthy brook trout population. The TWRA (1969b) stream survey report listed brook trout along with rainbow trout as the primary fish species present.

Recent Forest Service surveys (Elsen 1978) found brook trout still thriving in Birch Branch, however, rainbow trout are beginning to move well up into the stream. A sympatric brook/rainbow trout population now exists approximately 1.4 km (0.9 mi) above the mouth of the stream. From that point on into the headwaters, an allopatric brook trout population occurs. This stream has excellent water quality, and is one of the longer brook trout streams on the Cherokee National Forest. A barrier should be built in the lower section of the stream and rainbow trout should be removed to insure the future survival of the brook trout population.

One interesting note; brook trout from Birch Branch were used by Harris et al. (1978) of Tennessee Technological University, Tennessee Cooperative Fishery Research Unit in genetic research of brook trout from the Southern Appalachian region and by Konopacky (1978) for age and growth analysis.

195 Old Road Branch

Map Location: Shady Valley Quadrangle (213-SW). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the southeast side of Holston Mountain just northeast of Rutter Ridge in Johnson County, Tennessee.

Ownership Pattern: The entire 1.9 km (1.2 mi) of stream is on Forest Service land.

Elevation:
Mouth - 774 m (2,540 ft)
Head - 988 m (3,240 ft)

Aspect: Southeast

Stream Size: (Elsen, personal communication):
Width - approximately 0.3 m (1.0 ft)
Depth - approximately 7.6 cm (3.0 in)

Percent Grade: 11.0%

Barriers: Not Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Speceis Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: Tatum (1968) listed this stream as having brook trout. On his list it is recorded as Road Branch, a tributay to Beaverdam Creek located between Parks Branch and Birch Branch, however, on the quadrangle map the name of the stream is listed as Old Road Branch. It is a very small stream not capable of supporting fish, and it is very probable that it was mistakenly listed by Tatum as a brook trout stream (Elsen, personal communication).

196 Parks Branch

Map Location: Shady Valley Quadrangle (213-SW) and Laurel Bloomery (213-SE). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the north side of Iron Mountain just northeast of Grindstone Ridge in Johnson County, Tennessee.

Ownership Pattern: The lower 0.8 km (0.5 mi) of stream is on private land, and the remaining 5.0 km (3.1 mi) of stream is on Forest Service land.

Elevation:
Mouth - 777 m (2,550 ft)
Head - 1,122 m (3,680 ft)

Aspect: Northwest

Stream Size: (Determined in June 1978 at 817 m - 2,680 ft elevation):
Width - 2.1 m (7.0 ft)
Depth - 12.7 cm (5.0 in)

Velocity - 0.4 meter per second (1.3 foot per second)
Cubic Meters Per Second - 0.12 (3.9 CFS)
Water Level Conditions - normal

Percent Grade: 5.9%

Barriers: None

Water Quality: (Determined 12 June 1969 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 10 ppm
Hardness - 34 ppm
M.O. Alkalinity - 34 ppm
Temperature - 15°C (59°F)

Sources of Pollution: None

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Mottled sculpin (Cottus bairdi)
Central stoneroller (Campostoma anomalum)
Salamanders, crayfish, and aquatic insects.

Fish Collected: June 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 37
Number of Brook Trout Less Than 100 mm: 46
Number of Rainbow Trout Greater Than 100 mm: 18
Number of Rainbow Trout Less Than 100 mm: 4

Stream Conditions: There is an overall mixture of pools and riffles of about 35%. Riffle areas make up approximately 65% of the stream, while about 20% of the stream is made up of pools, no flats, and the remaining 15% is in cascades or bedrock areas. The stream bottom is composed of large and small rubble, gravel, and bedrock. Pools are few, but the ones that are present provide good cover for fish. Siltation is very light.

Vegetative Conditions: The streambank has approximately 95% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), birch (Betula spp.), and hemlock (Tsuga canadensis). About 5% of the stream (on private land) has only understory vegetation made up primarily of rhododendron (Rhododendron spp.).

Discussion: Tatum (1968) listed this stream as having brook trout. The TWRA (1969b) stream survey report listed brook trout as the primary species present. A recent Forest Service survey (Elsen 1978) also found brook trout present. However, at that time, the entire stream was also mixed with rainbow trout. It was suggested that a barrier be constructed near the lower

Forest Service boundary and rainbow trout removed. No barrier was constructed but rainbow trout were removed by electroshocking in the fall of 1983 and released on the private land section of the stream (Strange 1983).

This stream has excellent water quality and a healthy brook trout population. A barrier should be constructed and continued rainbow trout removal is necessary to help protect this resource.

197 Marshall Branch

Map Location: Shady Valley Quadrangle (213-SW). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the southeast side of Holston Mountain northeast of McQueen Gap in Johnson County, Tennessee.

Ownership Pattern: The lower 1.3 km (0.8 mi) of stream is on private land, and the upper 2.3 km (1.4 mi) of stream is on Forest Service land.

Elevation:
Mouth - 780 m (2,560 ft)
Head - 1,049 m (3,440 ft)

Aspect: Southeast

Stream Size: (Determined in September 1978 at 872 m - 2,860 ft elevation):
Width - 1.5 m (5.0 ft)
Depth - 10.2 cm (4.0 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.06 (2.0 CFS)
Water Level Conditions - moderately low

Percent Grade: 7.6%

Barriers: None

Water Quality: (Determined 12 June 1969 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 34 ppm
Temperature - 16°C (60°F)

(Determined in September 1978 at 872 m - 2,860 ft elevation):
Conductivity - 200 umhos/cm
Siltation - medium

Sources of Pollution: Siltation from old log road, and slash from logging.

Other Species Present: None Recorded

Stream Conditions: There is an overall mixture of pools and riffles of about 65%. Riffle areas make up approximately 65% of the stream while about 35% is made up of pools. It has no flats or cascades or bedrock areas. The stream bottom is composed of small rubble and gravel. Recent logging activities have put siltation and logging debris in the stream. Siltation is medium. The lower portion of the stream sinks into the substrate, and some actively eroding streambanks are present.

Vegetative Conditions: The streambank has approximately 90% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow poplar (Liriodendron tulipifera), birch (Betula spp.), and rhododendron (Rhododendron spp.). About 10% of the streambank has rhododendron understory but no overstory vegetation.

Discussion: This stream had no trout present (Elsen 1978) nor was it listed previously as being a brook trout stream (TWRA 1969b). It is only mentioned here because it has some potential for brook trout management. Water quality has improved in this stream since logging activities ceased, and brook trout have been stocked. It received 26 native brook trout from Heaberlin Branch (the next upstream tributary to Beaverdam Creek) in 1982 in an effort to start a brook trout population (Elsen, personal communication).

198 Heaberlin Branch

Map Location: Shady Valley Quadrangle (213-SW). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the southeast side of Holston Mountain just south of McQueen Gap in Johnson County, Tennessee.

Ownership Pattern: The lower 1.0 km (0.6 mi) of stream is on private land, and the upper 2.4 km (1.5 mi) is on Forest Service land.

Elevation:
Mouth - 789 m (2,590 ft)
Head - 1,033 m (3,390 ft)

Aspect: Southeast

Stream Size: (Determined in September 1978 at 829 m - 2,720 ft elevation):
Width - 1.5 m (5.0 ft)
Depth - 8.9 cm (3.5 in)
Velocity - 0.3 meter per second (0.9 foot per second)
Cubic Meters Per Second - 0.04 (1.4 CFS)
Water Level Conditions - slightly low

Percent Grade: 7.2%

Barriers: 1. Man-made rock and mortar barrier near the lower Forest Service boundary.

Water Quality: (Determined in September 1978 at 829 m - 2,720 ft elevation):
pH - 6.7
Conductivity - 20 umhos/cm
Siltation - slight

Sources of Pollution: None

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Sculpin (Cottus spp.)

Fish Collected: September 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 61
Number of Brook Trout Less Than 100 mm: 107
Number of Rainbow Trout Greater Than 100 mm: 11
Number of Rainbow Trout Less Than 100 mm: 2

Stream Conditions: There is an overall mixture of pools and riffles of about 65%. Riffle areas make up approximately 35% of the stream while about 30% is made up of pools, no flats, and the remaining 25% is in cascades or bedrock areas. The stream bottom is composed of rubble and boulders with lots of bedrock in the upper reaches. Overall it is a fairly small stream, but it has some good pools. Siltation is slight.

Vegetative Conditions: The streambank has approximately 95% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), birch (Betula spp.), yellow poplar (Liriodendron tulipifera), and rhododendron (Rhododendron spp.). About 5% of the streambank has rhododendron understory but no overstory vegetation.

Discussion: Elsen (1978) found a brook trout population present in this stream. It has not been listed previously as having brook trout. He stated that Heaberlin Branch is small, but it has some good pools and a healthy brook trout population along

with a few rainbow trout in the lower section. Also, the stream has a sustained flow, even in low water periods. Elsen suggested that a barrier near the lower Forest Service boundary and rainbow trout removal would help to protect the brook trout population.

In 1980, a small rock and mortar barrier was constructed and 12 rainbow trout were removed from above the barrier in 1982. Another 25 rainbow trout (21 were y-o-y) were removed in 1983. No rainbow trout were found more than 0.8 km (0.5 mi) above the barrier (Strange 1983). So far rainbow trout removal efforts look good, but continued, periodic monitoring of the stream should be done to protect the brook trout resource. In 1982, 26 brook trout from Heaberlin Branch were transported to Marshall Branch (the next downstream Beaverdam Creek tributary) in an effort to start a brook trout population in that stream (Elsen, personal communication).

199 Johnson Blevins Branch

Map Location: Shady Valley Quadrangle (213-SW) and Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the northwest side of Iron Mountain near Grindstone Ridge in Johnson County, Tennessee.

Ownership Pattern: The lower 2.4 km (1.5 mi) of the stream is on private land, and the remaining 2.6 km (1.6 mi) of stream is on Forest Service land.

Elevation:
Mouth - 803 m (2,635 ft)
Head - 1,164 m (3,820 ft)

Aspect: Northwest

Stream Size: (Determined in September 1978 at 914 m - 3,000 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.08 (2.5 CFS)
Water Level Conditions - low

Percent Grade: 7.2%

Barriers: None

Water Quality: (Determined 12 June 1969 by TWRA stream survey):
ph - 6.8
Dissolved Oxygen - 9 ppm

Hardness - 17 ppm
M.O. Alkalinity - 40 ppm
Temperature - 15°C (59°F)

Sources of Pollution: None

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Blacknose dace (Rhinichthys atratulus)
Sculpin (Cottus spp.)

Fish Collected: September 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 82
Number of Brook Trout Less Than 100 mm: 33
Number of Rainbow Trout Greater Than 100 mm: 1
Number of Rainbow Trout Less Than 100 mm: 9

Stream Conditions: There is an overall mixture of pools and riffles of about 80%. Riffle areas make up approximately 40% of the stream, while about 40% is made up of pools, no flats, and the remaining 20% is in cascades or bedrock areas. The stream bottom is composed of large and small rubble, gravel, boulders, and bedrock. There are some good pools, and siltation is light.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), oak (Quercus spp.), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp).

Discussion: Tatum (1968) listed this stream as having a brook trout population and the TWRA (1969b) stream survey report listed brook trout as the primary species present. Elsen (1978) also found brook trout present in the stream. He stated that Johnson Blevins Branch has excellent water quality and a healthy brook trout population. He also stressed that a barrier is needed to protect the population from upstream movement of rainbow trout. The barrier could be built near the lower Forest Service boundary and rainbow trout above it should be removed by electroshocking. To date, this barrier has not been constructed. Overall, this is an excellent brook trout stream and its protection should be first priority.

In 1969, 37 brook trout from Johnson Blevins Branch were transported to Henderson Creek in Monroe County during a renovation of that stream (L.P. Wilkins, personal communication).

200 McQueen Branch

Map Location: Shady Valley Quadrangle (213-SW). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the southeast side of Holston Mountain near Double Spring Gap in Johnson County, Tennessee.

Ownership Pattern: About 2.1 km (1.3 mi) of the stream is on private land. The remaining 0.8 km (0.5 mi) is on Forest Service land.

Elevation:
Mouth - 828 m (2,715 ft)
Head - 1,024 m (3,360 ft)

Aspect: Southeast

Stream Size: (Determined in June 1978 at 914 m - 3,000 ft elevation):
Width - 1.2 m (4.0 ft)
Depth - 6.4 cm (2.5 in)
Velocity - 0.3 meter per second (1.0 foot per second)
Cubic Meters Per Second - 0.02 (0.8 CFS)
Water Level Conditions - normal

Percent Grade: 9.4%

Barriers: None

Water Quality: (Determined in June 1978 at 914 m - 3,000 ft elevation):
pH - 6.8
Temperature - 15°C (59°F)
Siltation - fairly light

Sources of Pollution: Sedimentation from road and dwellings.

Other Species Present:
Rainbow trout (*Salmo gairdneri*)
Mottled sculpin (*Cottus bairdi*)
Blacknose dace (*Rhinichthys atratulus*)
Crayfish, salamanders, and aquatic insects.

Fish Collected: June 1978 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 5
Number of Rainbow Trout Less Than 100 mm: 1

Stream Conditions: There is an overall mixture of pools and riffles of about 10%. Riffle areas make up approximately 90% of the stream, while about 10% is made up of pools, and there are

no flats, cascades, or bedrock areas. The stream bottom is composed of large and small rubble, gravel, and silt. It is a small stream with just a few pools in the lower section.

Vegetative Conditions: The streambank has approximately 70% of overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), birch (Betula spp.), and rhododendron (Rhododendron spp.). About 20% of the stream has no overstory and little or no shade providing understory.

Discussion: Tatum (1968) listed this stream as having a brook trout population. However, Elsen (1978) found only a few rainbow trout near the mouth and the lower reaches. He stated that the stream probably has no future potential for brook trout management because it is a small stream, and is only marginally suited for trout. There is little in the way of cover for fish, water quality is not the best, and most of the stream is on private land.

201 Ledford Branch

This stream was listed in the TWRA (1969b) stream survey report as having brook trout. However, no Beaverdam Creek tributary is named Ledford Branch on the quadrangle map and local residents, when questioned, had never heard of Ledford Branch either. Based on data given in the TWRA (1969b) stream survey report, Ledford Branch may actually be McQueen Branch which now has only rainbow trout. This cannot be positively confirmed however.

202 Jim Wright Branch

Map Location: Shady Valley Quadrangle (213-SW) and Doe Quadrangle (214-NW). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the northwest side of the Iron Mountains west of Battleham Gap. It is located in Johnson County, Tennessee.

Ownership Pattern: The lower 2.7 km (1.7 mi) of stream is on private land, and the remaining 1.4 km (0.9 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 849 m (2,785 ft)
Head - 1,189 m (3,900 ft)

Aspect: Northwest

Stream Size: (Determined 27 June 1984 at 920 m - 3,020 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 14.0 cm (5.5 in)
Velocity - 0.4 meter per second (1.2 foot per second)
Cubic Meters Per Second - 0.08 (2.6 CFS)
Water Level Conditions - normal

Percent Grade: 8.1%

Barriers: None

Water Quality: (Determined 12 June 1969 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm
M.O. Alkalinity - 34 ppm
Temperature - 15°C (59°F)

(Determined 27 June 1984 at 920 m - 3,020 ft elevation):
pH - 7.3
Total Hardness - 3 ppm
Temperature - 13°C (55°F)
Siltation - fairly heavy

Sources of Pollution: Not Recorded

Other Species Present:
Rainbow trout (*Salmo gairdneri*)
Blacknose dace (*Rhinichthys atratulus*)
Crayfish

Fish Collected: 27 June 1984 by Bivens
Brook Trout Average Length: 120.0 mm (4.7 in)
Brook Trout Average Weight: 18.7 g (0.7 oz)
Average K Brook Trout Greater Than 100 mm: 1.08
Number of Brook Trout Greater Than 100 mm: 22
Number of Brook Trout Less Than 100 mm: 9
Rainbow Trout Average Length: 140.0 mm (5.5 in)
Rainbow Trout Average Weight: 24.0 g (0.9 oz)
Average K Rainbow Trout Greater Than 100 mm: 0.87
Number of Rainbow Trout Greater Than 100 mm: 2
Number of Rainbow Trout Less Than 100 mm: 0

Stream Conditions: Riffle areas make up approximately 70% of the stream, while about 20% is made up of pools, 5% in flats, and the remaining 5% is in cascades or bedrock areas. The stream is small and mostly riffles with a few shallow pools. The bottom is composed of some sand, fine gravel, rubble, rocks, and many boulders. Siltation is fairly heavy , but riffle

areas are clean.

Vegetative Conditions: The local watershed has about 90% timber, 5% pasture, and 5% cultivation. The portion of the stream where brook trout were found has 100% overstory and understory vegetation made up predominantly of hemlock (Tsuga canadensis), yellow birch (Betula alleghaniensis), yellow poplar (Liriodendron tulipifera), maples (Acer spp.), witch hazel (Hamamelis virginiana), and rhododendron (Rhododendron spp.).

Discussion: The TWRA (1969b) stream survey report listed brook trout as the primary species present in Jim Wright Branch. Bivens (1984) found brook trout still present in the stream along with a few rainbow trout. Brook trout were found from about 910 m (2,985 ft) elevation up to about 1,012 m (3,320 ft) elevation. The stream has 0.5 km (0.3 mi) of sympatric brook/rainbow trout up to about 946 m (3,105 ft) elevation and about 0.6 km (0.4 mi) of allopatric brook trout trout water. Although the stream is fairly small, it has a fairly good population of brook trout in the lower portion. Only two rainbow trout were collected, but they may soon become established. Therefore, it would be good to start a rainbow trout removal program soon. Protection of this resource is suggested.

203 East Fork Beaverdam Creek

Map Location: Doe Quadrangle (214-NW). This stream is a tributary to Beaverdam Creek. Its headwaters begin on the northwest side of Iron Mountain north of Shady Gap in Johnson County, Tennessee.

Ownership Pattern: The lower 1.4 km (0.9 mi) is on private land, and the remaining 2.6 km (1.6 mi) of stream is on Forest Service land.

Elevation:
Mouth - 856 m (2,810 ft)
Head - 1,186 m (3,890 ft)

Aspect: Northwest

Stream Size: (Determined in September 1978 at 908 m - 2,980 ft elevation):
Width - 2.1 m (7.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.3 meter per second (0.9 foot per second)
Cubic Meters Per Second - 0.08 (2.6 CFS)
Water Level Conditions - moderately low

Percent Grade: 8.2%

Barriers: 1. Man-made barrier at about 890 m (2,920 ft) elevation.

Water Quality: (Determined 12 June 1969 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 10 ppm
Hardness - 34 ppm
M.O. Alkalinity - 34 ppm
Temperature - 17°C (62°F)

(Determined in September 1978 at 890 m - 2,920 ft elevation):
pH - 6.9
Conductivity - 10 umhos/cm
Temperature - 12°C (54°F)
Siltation - fairly light

Sources of Pollution: Some siltation from logging roads.

Other Species Present:
Rainbow trout (Salmo gairdneri)
Mottled sculpin (Cottus bairdi)
Salamanders, crayfish, and aquatic insects.

Fish Collected: September 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 65
Number of Brook Trout Less Than 100 mm: 82
Number of Rainbow Trout Greater Than 100 mm: 0
Number of Rainbow Trout Less Than 100 mm: 5

Stream Conditions: There is an overall mixture of pools and riffles of about 80%. Riffle areas make up approximately 50% of the stream, while about 40% is made up of pools, no flats, and the remaining 10% is in cascades or bedrock areas. The stream bottom is composed of large and small rubble, gravel, boulders, and some bedrock and sand. There are some areas where boulders, fallen logs, and bedrock help to create good pools. Some siltation is present, but it is fairly light. On the private land section of the stream, channelization has left the stream with very few pools or cover for fish.

Vegetative Conditions: The streambank has approximately 90% of overstory and understory vegetation made up predominantly of yellow poplar (Liriodendron tulipifera), and rhododendron (Rhododendron spp.). About 10% of the stream (private land) has no overstory and little or no shade providing understory.

Discussion: Shields (1950) in his survey report of east Tennessee trout streams, stated that the upper portion of Beaverdam Creek supported a fair population of brook, with fair repro-

duction. This probably refers to the upper tributary stream of Beaverdam Creek, one of which is East Fork Beaverdam Creek. Tatum (1968) listed the stream as having brook trout, but stated that the population was very low at that time apparently because of erosion from logging and forest fires. The TWRA (1969b) stream survey report listed brook trout as the primary species present.

Elsen (1978) found that the stream has a healthy brook trout population. He reported that the upper 1.8 km (1.1 mi) of stream has an allopatric brook trout population with a 0.5 km (0.3 mi) sympatric brook/rainbow trout zone near the lower Forest Service boundary. He also stated that the stream has excellent water quality along with good pools and cover for trout habitat.

Since it has a healthy population of native brook trout, protecting the stream is of first importance. A crude 1.2 m (4.0 ft) man-made barrier has been constructed near the lower Forest Service boundary and rainbow trout have been removed by electrochocking with some success. A new permanent barrier, scheduled to be built in 1984, and continued rainbow trout removal will help to protect this brook trout population (Strange 1983).

Note; brook trout from East Fork Beaverdam Creek were used to stock Briar Creek in Washington County in 1983.

204 Valley Creek (Headwaters)

Map Location: Gravson Quadrangle (219-SW). This stream is a tributary to Whitetop Laurel Creek. Its headwaters begin east of Brier Ridge in Johnson County, Tennessee, and runs northwest into Washington County, Virginia.

Ownership Pattern: Total Length of the stream is 6.6 km (4.1 mi), but only 2.9 km (1.8 mi) of headwater is in Tennessee. Out of this, all but 0.3 km (0.2 mi) of extreme headwater is on Forest Service land. Part of the stream in Virginia is in the Jefferson National Forest.

Elevation:
Mouth - 722 m (2,370 ft)
Head - 1,330 m (4,365 ft)

Aspect: Northwest

Stream Size: (Determined in October 1981 at the state line, 972 m - 3,760 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 12.7 cm (5.0 in)

Velocity - 0.3 meter per second (1.1 foot per second)
Cubic Meters Per Second - 0.08 (2.8 CFS)
Water Level Conditions - slightly high

Percent Grade: 9.2%

Barriers: None

Water Quality: (Determined 1 October 1981 near state line):
Temperature - 9°C (49°F)

Sources of Pollution: None

Other Species Present: None Recorded

Fish Collected: October 1981 by Elsen
Number of Brook Trout Greater Than 100 mm: 16
Number of Brook Trout Less Than 100 mm: 36

Stream Conditions: There is an overall mixture of pools and riffles of about 40%. Riffle areas make up approximately 50% of the stream while about 25% is made up of pools, no flats, and the remaining 25% is in cascades or bedrock areas. The stream bottom is composed of gravel, small and large rubble, and bedrock. There are some pools where water tumbles over bedrock ledges. This is one of the cleanest streams reported, with almost no siltation.

Vegetative Conditions: The streambank has approximately 100% of overstory vegetation made up predominantly of birch (Betula spp.), and maple (Acer spp.). There is very little understory.

Discussion: Elsen (1981) found a brook trout population present in the stream. It has not been listed previously as having brook trout. He stated that the headwater of Valley Creek has excellent water quality and a native brook trout population. No extraordinary management is suggested other than protection of the brook trout resource. No information is available on the status of the stream on the Virginia side. There could be a possibility of rainbow trout encroachment and the presence or absence of barriers is unknown.

205 Richardson Branch

Map Location: Grayson Quadrangle (219-SW). This stream is a tributary to Valley Creek. Its headwaters begin on Flat Spring Ridge in Johnson County, Tennessee.

Ownership Pattern: The entire 1.6 km (1.0 mi) of stream is on Forest Service land except for a small wedge of private land that crosses the stream at about 1,097 m (3,600 ft) elevation.

Elevation:
Mouth - 985 m (3,230 ft)
Head - 1,183 m (3,880 ft)

Aspect: Northwest

Stream Size: Not Recorded

Percent Grade: 12.3%

Barriers: Not Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: Not Recorded

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: This stream has not been previously listed as having brook trout. It is only mentioned here because Elsen (1981) found brook trout near the mouth while surveying Valley Creek. Approximately 0.2 km (0.1 mi) of brook trout water is known to exist in Richardson Branch.

206 Lyons Branch

Map Location: Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Laurel Creek. Its headwaters begin on the southeast side of Iron Mountain in Johnson County, Tennessee.

Ownership Pattern: The entire 3.5 km (2.2 mi) of stream is on Forest Service land.

Elevation:
Mouth - 695 m (2,280 ft)
Head - 1,034 m (3,400 ft)

Aspect: Northeast

Stream Size: (Determined in September 1978 at 695 m - 2,280 ft elevation):
Width - 1.8 m (6.0 ft)
Depth - 12.7 cm (5.0 in)
Velocity - 0.5 meter per second (1.7 foot per second)
Cubic Meters Per Second - 0.13 (4.2 CFS)

Percent Grade: 9.6%

Barriers: None

Water Quality: (Determined 16 June 1969 by TWRA stream survey):
pH - 7.0
Dissolved Oxygen - 9 ppm
Hardness - 34 ppm
M.O. Alkalinity - 34 ppm
Temperature - 14°C (58°F)

Sources of Pollution: Some siltation from skid trails around the headwaters.

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Sculpin (Cottus spp.)
Fantail darter (Etheostoma flabellare) - collected near the mouth only.

Fish Collected: September 1978 by Elsen
Number of Rainbow Trout Greater Than 100 mm: 68
Number of Rainbow Trout Less Than 100 mm: 50

Stream Conditions: There is an overall mixture of pools and riffles of about 55%. Riffle areas make up approximately 60% of the stream while about 30% is made up of pools, no flats, and the remaining 10% is in cascades or bedrock areas. The stream bottom is composed of small and large rubble with gravel, bedrock, and some boulders. There are some good pools in the lower section of the stream and fewer, shallower pools in the upper reaches. Some siltation is present, but it is not too heavy.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), yellow poplar (Liriodendron tulipifera), hemlock (Tsuga canadensis), oak (Quercus spp.), and rhododendron (Rhododendron spp.).

Discussion: Tatum (1968) listed this stream as having a healthy brook trout population. The TWRA (1969b) stream survey report also listed brook trout as the primary species present. How-

ever, Elsen (1978) found only rainbow trout in the stream. It appears to have excellent water quality and a healthy, well established, rainbow trout population. Lyons Branch probably has no future potential for brook trout management.

207 Gentry Creek

Map Location: Laurel Bloomery Quadrangle (213-SE) and Grayson Quadrangle (219-SW). This stream is a tributary to Laurel Creek. Its headwaters begin high on the western slope of Stone Mountain near the Tennessee, Virginia, and North Carolina corner, in Johnson County, Tennessee.

Ownership Pattern: The lower 3.5 km (2.2 mi) of stream is on private land, and the remaining 8.4 km (5.2 mi) of stream is on Forest Service land with a small wedge of private land crossing the stream at about 890 m (2,920 ft) elevation and running upstream for approximately 0.3 km (0.2 mi).

Elevation:
Mouth - 730 m (2,395 ft)
Head - 1,381 m (4,530 ft)

Aspect: Southwest

Stream Size: (Determined in September 1978 at the lower Forest Service boundary, 805 m - 2,640 ft elevation):
Width - 2.7 m (9.0 ft)
Depth - 15.2 cm (6.0 in)
Velocity - 0.5 meter per second (1.8 foot per second)
Cubic Meters Per Second - 0.24 (8.1 CFS)
Water Level Conditions - low

Percent Grade: 5.5%

Barriers: 1. Double falls; at about 1,024 m (3,360 ft) elevation.

Water Quality: (Determined by Shields 1950):
pH - 6.7
Maximum Temperature - 17°C (63°F)

(Determined 16 June 1969 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 10 ppm
Hardness - 17 ppm
M.O. Alkalinity - 14 ppm
Temperature - 16°C (60°F)

(Determined in September 1978 at 850 m - 2,790 ft elevation):
pH - 7.0
Conductivity - 15 umhos/cm

Sources of Pollution: None

Other Species Present:
Rainbow trout (Salmo gairdneri)
Sculpin (Cottus spp.)
Blacknose dace (Rhinichthys atratulus)
Crayfish

Fish Collected: September 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 42
Number of Brook Trout Less Than 100 mm: 21
Number of Rainbow Trout Greater Than 100 mm: 80
Number of Rainbow Trout Less Than 100 mm: 58

Stream Conditions: There is an overall mixture of pools and riffles of about 80%. Riffle areas make up approximately 45% of the stream while about 35% is made up of pools, no flats, and the remaining 20% is in cascades or bedrock areas. The stream bottom is composed of small and large rubble with gravel, boulders, and bedrock. In the lower elevation, it is mostly shallow areas with few good pools. Bedrock, boulders, and fallen logs help to create some good pools. Siltation is slight.

Vegetative Conditions: The streambank has approximately 99% of overstory and understory vegetation made up predominantly of birch (Betula spp.), yellow poplar (Liriodendron tulipifera), hemlock (Tsuga canadensis), and rhododendron (Rhododendron spp.). About 1% of the streambank has no overstory vegetation but rhododendron is present in this section.

Discussion: Tatum (1968) listed this stream as having a healthy brook trout population. The TWRA (1969b) stream survey report also listed brook trout along with rainbow trout as the primary species present in Gentry Creek. Elsen (1978) found brook trout still present along with an invading rainbow trout population. At that time, rainbow trout were found to about 878 m (2,880 ft) elevation, and mixed brook/rainbow trout to about 1,024 m (3,360 ft) elevation where a falls is a barrier to upstream movement of rainbow trout. Above this falls, brook trout exist to approximately 1,170 m (3,840 ft) elevation.

Gentry Creek is a well known brook trout stream by local anglers. It has excellent water quality and is an outstanding trout stream with both native brook and rainbow trout. Protection of the brook trout population should be of first

importance. A barrier should be constructed below Grindstone Branch and an intensive effort made to remove rainbow trout upstream. This would allow brook trout from Grindstone Branch, Kate Branch, and Gentry Creek to mix and still maintain a good rainbow trout fishery below the barrier. It would be a tremendous undertaking to remove rainbow trout in Gentry Creek and may prove impossible to remove all of them. However, periodic removal of rainbow trout would be beneficial to the brook trout population and to the brook trout fishery. An effort has already been made to remove rainbow trout from Kate Branch. Rainbow trout removal would also be necessary from Grindstone Branch as they now exist upstream for about 1.0 km (0.6 mi). Protection of this genetic pool of native brook trout is very important.

208 Grindstone Branch

Map Location: Grayson Quadrangle (219-SW). This stream is a tributary to Gentry Creek which is a tributary to Laurel Creek. Its headwaters begin north of Grindstone Ridge in Johnson County, Tennessee.

Ownership Pattern: The entire 2.6 km (1.8 mi) of stream is on Forest Service land.

Elevation:
Mouth - 850 m (2,790 ft)
Head - 1,170 m (3,840 ft)

Aspect: Northeast

Stream Size: (Determined in September 1978 at 850 m - 2,790 ft elevation):
Width - 1.5 m (5.0 ft)
Depth - 8.9 cm (3.5 in)
Velocity - 0.3 meter per second (0.9 foot per second)
Cubic Meters Per Second - 0.04 (1.3 CFS)
Water Level Conditions - low

Percent Grade: 11.0%

Barriers: None

Water Quality: (Determined 16 June 1969 by TWRA stream survey):
pH - 6.8
Dissolved Oxygen - 9 ppm
Hardness - 17 ppm

M.O. Alkalinity - 14 ppm
Temperature - 10°C (50°F)

(Determined in September 1978 at 853 m - 2,800 ft elevation):
pH - 6.9
Conductivity - 15 umhos/cm
Siltation - fairly light

Sources of Pollution: None

Other Species Present:
Rainbow trout (Salmo gairdneri)
Sculpin (Cottus spp.)
Salamanders and crayfish.

Fish Collected: September 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 29
Number of Brook Trout Less Than 100 mm: 16
Number of Rainbow Trout Greater Than 100 mm: 20
Number of Rainbow Trout Less Than 100 mm: 9

Stream Conditions: There is an overall mixture of pools and riffles of about 40%. Riffle areas make up approximately 55% of the stream while about 25% is made up of pools, 10% in flats, and the remaining 10% is in cascades or bedrock areas. The stream bottom is composed of small rubble and gravel with boulders and some bedrock. The stream is small with many shallow pools and a few good, deep pools. Siltation is fairly light.

Vegetative Conditions: The streambank has approximately 100% of overstory vegetation made up predominantly of birch (Betula spp.), yellow poplar (Liriodendron tulipifera), cucumber tree (Magnolia acuminata), and rhododedron (Rhododendron spp). The rhododendron is thick along the stream.

Discussion: Tatum (1968) listed this stream as having brook trout. He stated that the population was very low at that time and concluded this was due to erosion caused by forest fires and logging. TWRA (1969b) stream survey report listed brook trout as the primary species present. Elsen (1978) found brook trout still present in Grindstone Branch, along with an invading rainbow trout population. To protect the brook trout population, he suggested that a barrier be constructed near the mouth and rainbow trout be removed from above the barrier.

Grindstone Branch is a fairly small stream but appears to have excellent water quality. Its brook trout population provides some angling, plus wild brook trout can go downstream and recruit to the Gentry Creek fishery. To date no barrier has been built, and rainbow trout are still encroaching on the

brook trout population. Future management procedures should be directed at protecting this wild brook trout population.

209 Kate Branch

Map Location: Grayson Quadrangle (219-SW). This stream is a tributary to Gentry Creek which is a tributary to Laurel Creek. Its headwaters begin southeast of Rogers Ridge near Haw Gap in Johnson County, Tennessee.

Ownership Pattern: The entire 2.9 km (1.8 mi) of stream is on Forest Service land.

Elevation:
Mouth - 899 m (2,950 ft)
Head - 1,219 m (4,000 ft)

Aspect: Southwest

Stream Size: (Determined in September 1978 at 914 m - 3,000 ft elevation):
Width - 1.5 m (5.0 ft)
Depth - 10.2 cm (4.0 in)
Velocity - 0.2 meter per second (0.8 foot per second)
Cubic Meters Per Second - 0.04 (1.3 CFS)
Water Level Conditions - low

Percent Grade: 11.0%

Barriers: 1. Man-made; rock and mortar at about 914 m (3,000 ft) elevation.

Water Quality: (Determined in September 1978 at 914 m - 3,000 ft elevation):
pH - 7.0
Conductivity - 20 umhos/cm
Siltation - fairly light

Sources of Pollution: Some siltation from old road.

Other Fish Species Present:
Rainbow trout (Salmo gairdneri)
Sculpin (Cottus spp.)

Fish Collected: Spetember 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 56
Number of Brook Trout Less Than 100 mm: 69
Number of Rainbow Trout Greater Than 100 mm: 13
Number of Rainbow Trout Less Than 100 mm: 6

Stream Conditions: There is an overall mixture of pools and riffles of about 40%. Riffle areas make up approximately 60% of the stream while about 20% is made up of pools, no flats, and the remaining 20% is in cascades or bedrock areas. The stream is small and the bottom is composed of rubble and gravel with bedrock in the headwaters. Large boulders in the lower section help to create some nice pools. Siltation is fairly light.

Vegetative Conditions: The streambank has approximately 100% of overstory and understory vegetation made up predominantly of birch (Betula spp.), yellow poplar (Liriodendron tulipifera), cove hardwoods, and rhododendron (Rhododendron spp.).

Discussion: Tatum (1968) listed this stream as having brook trout. He stated that the population was very low at that time and concluded this was due to erosion caused by forest fires and logging. Elsen (1978) found brook trout still present in Kate Branch, along with an invading rainbow trout population. To protect the brook trout population, he suggested that a rock and mortar barrier be constructed near the mouth and rainbow trout removed from above the barrier.

The barrier was built in 1983 and rainbow trout removal begun. On two separate occasions in 1983, 100 rainbow trout were removed. Many of these in the September 1983 trip were y-o-y, therefore, a continued rainbow trout removal effort is suggested (Strange 1983).

Kate Branch is small, but has good water quality and a very steady flow. Protection of this native brook trout resource is important and recent management work has been encouraging.

210 Gilbert Branch

Map Location: Grayson Quadrangle (210-SW). This stream is a tributary to Gentry Creek which is a tributary to Laurel Creek. Its headwaters begin high on the west face of Stone Mountain in Johnson County, Tennessee.

Ownership Pattern: The entire 2.1 km (1.3 mi) of stream is on Forest Service land.

Elevation:
Mouth - 1,090 m (3,575 ft)
Head - 1,291 m (4,235 ft)

Aspect: West

Stream Size: Not Recorded

Percent Grade: 9.6%

Barriers: Not Recorded

Water Quality: Not Recorded

Sources of Pollution: Not Recorded

Other Species Present: None Recorded

Fish Collected: October 1978 by Elsen
Number of Brook Trout Greater Than 100 mm: 11
Number of Brook Trout Less Than 100 mm: 9

Stream Conditions: Not Recorded

Vegetative Conditions: Not Recorded

Discussion: Elsen (1978) found this stream to have brook trout present. It has not been previously listed as having brook trout. It is a small stream with a few pools that hold trout. Water quality appears to be excellent. He found brook trout near the mouth and estimated that they went up to about 1,219 m (4,000 ft) elevation. This stream is protected from rainbow trout invasion by a falls that is on Gentry Creek. No extraordinary management is suggested other than protection of the stream.

211 Hoot Owl Hollow

Map Location: Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Laurel Creek. It is located on the southeast side of the Iron Mountains, northeast of Lord Ridge in Johnson County, Tennessee.

Ownership Pattern: Total length of the stream is 4.3 km (2.7 mi). The lower 2.1 km (1.3 mi) of stream is on private land, the next 0.8 km (0.5 mi) runs through Forest Service land, then the following 0.8 km (0.5 mi) runs back through private land, and the remaining 0.6 km (0.4 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 767 m (2,515 ft)
Head - 1,109 m (3,640 ft)

Aspect: Southeast

Stream Size:
Average Width - 1.5 m (5.0 ft)
Width Varies - 0.6 to 2.4 m (2.0 to 8.0 ft)
Average Pool Depth - 25.4 cm (10.0 in)
Average Riffle Depth - 7.6 cm (3.0 in)

Percent Grade: 7.9%

Barriers: None

Water Quality: (Determined 16 June 1969 by TWRA stream survey):
pH - 7.5
Dissolved Oxygen - 9 ppm
Hardness - 34 ppm
M.O. Alkalinity - 17 ppm
Temperature - 17°C (63°F)

Sources of Pollution: Not Recorded

Other Fish Species Present:
Blacknose dace (*Rhinichthys atratulus*)
Sculpin (*Cottus* spp.)

Fish Collected: 28 May 1984
Brook Trout Average Length: 152.5 mm (6.0 in)
Number of Brook Trout Greater Than 100 mm: 13
Number of Brook Trout Less Than 100 mm: 5

Stream Conditions: Good habitat conditions for brook trout management. The stream has very little bedrock but, in some places an old road runs into the stream. Siltation is light.

Vegetative Conditions: The watershed has had extensive logging (in 1979 and 1980) but, for the most part, the canopy was left along the stream. Exceptionally good timber harvest practices were used for a private operator on private land (Alan Polk, personal communication).

Discussion: The TWRA (1969b) stream survey report listed minnows (Cyprinids) as the primary species present in Hoot Owl Hollow. However, Bivens (1984) reported that brook trout were present in much of the upper stream. Brook trout were found from about 789 m (2,590 ft) elevation up to about 902 m (2,960 ft) elevation in the main stream. Brook trout were also found for a short distance up four of the headwater tributaries. The stream has about 3.4 km (2.1 mi) of allopatric brook trout water (includes the above mentioned tributaries). It has fairly good stream conditions and an apparently healthy brook trout population (Alan Polk, personal communication). Therefore, protection of this resource is strongly suggested.

212 Flatwood Branch

Map Location: Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Laurel Creek. It is located on the southeast side of the Iron Mountains, northeast of Lord Ridge in Johnson County, Tennessee.

Ownership Pattern: The lower 2.4 km (1.4 mi) of stream is on private land and the remaining 0.6 km (0.4 mi) of headwater is on Forest Service land.

Elevation:
Mouth - 783 m (2,570 ft)
Head - 1,097 m (3,600 ft)

Aspect: Southeast

Stream Size:
Average Width - 1.8 m (6.0 ft)
Width Varies - 0.6 to 3.0 m (2.0 to 10.0 ft)
Average Pool Depth - 25.4 cm (10.0 in)
Average Riffle Depth - 10.2 cm (4.0 in)

Percent Grade: 10.3%

Barriers: Not Recorded

Water Quality: (Determined 16 June 1969 by TWRA stream survey):
pH - 7.8
Dissolved Oxygen - 9 ppm
Hardness - 51 ppm
M.O. Alkalinity - 69 ppm
Temperature - 10°C (50°)

Sources of Pollution: Not Recorded

Other Fish Species Present:
Blacknose dace (Rhinichthys atratulus)
Sculpin (Cottus spp.)

Stream Conditions: The stream is small throughout its entirety and at periods of minimum flow, the water level may not be sufficient to support trout.

Vegetative Conditions: Extensive logging has occurred in much of the watershed.

Discussion: The TWRA (1969b) stream survey report listed brook trout along with rainbow trout (Salmo gairdneri) as the primary species present in Flatwood Branch. However, Bivens

(1984) reported that no trout were found in the stream. Due to its small size and stream conditions, this stream probably has no potential for brook trout management.

213 Corum Branch

Map Location: Laurel Bloomery Quadrangle (213-SE). This stream is a tributary to Laurel Creek. It is located on the southeast side of the Iron Mountains near Lord Ridge in Johnson County, Tennessee.

Ownership Pattern: About 2.7 km (1.7 mi) of the stream is on private land and the remaining 0.3 km (0.2 mi) of extreme headwaters is on Forest Service land.

Elevation:
Mouth - 792 m (2,597 ft)
Head - 1,064 m (3,490 ft)

Aspect: Southeast

Stream Size:
Average Width - 2.1 m (7.0 ft)
Width Varies - 0.6 to 3.4 m (2.0 to 11.0 ft)
Average Pool Depth - 25.4 cm (10.0 in)
Average Riffle Depth - 10.2 cm (4.0 in)

Percent Grade: 8.9%

Barriers: Not Recorded

Water Quality: (Determined 16 June 1969 by TWRA stream survey):
pH - 7.8
Dissolved Oxygen - 9 ppm
Hardness - 51 ppm
M.O. Alkalinity - 68 ppm
Temperature - 15°C (59°F)

Sources of Pollution: Not Recorded

Other Fish Species Present:
Blacknose dace (*Rhinichthys atratulus*)
Sculpin (*Cottus* spp.)

Stream Conditions: Not Recorded

Vegetative Conditions: The local watershed has about 70% timber, 25% pasture, and 5% cultivation.

Discussion: The TWRA (1969b) stream survey report listed brook trout along with rainbow trout (Salmo gairdneri) as the primary species present. However, Bivens (1984) reported that no trout were found in the stream. Stream conditions were not determined, but this stream may possibly have some potential for brook trout management.

APPENDIX B

TOPOGRAPHICAL MAPS

Table 7. List of TVA and USGS topographical 7.5 minute quadrangle maps used in this report.

Name of Quadrangle	Map Scale 1:24,000 TVA Number	Edition Year	Year of Photorevision
Hemp Top	127-NE	1959	--
Caney Creek	126-SE	1967	--
Ducktown	133-SW	1957	1974
Bald River Falls	140-SW	1957	1978
Big Junction	140-SE	1957	1978
Unaka	141-NE	1957	1978
Silers Bald	157-SE	1964	--
Clingmans Dome	165-SW	1964	--
Wear Cove	157-NW	1953	1974
Thunderhead Mountain	157-SW	1964	--
Gatlinburg	157-NE	1956	--
Mount Le Conte	165-NW	1964	--
Richardson Cove	164-SW	1940	--
Jones Cove	164-SE	1940	1978
Mount Guyot	165-NE	1964	--
Newport	173-NW	--	--
Hartford	173-SW	1940	1968
Luftee Knob	174-NW	1964	--
Neddy Mountain	173-NE	1940	--
Paint Rock	182-NW	1940	--
Lemon Gap	182-SW	1940	--
Waterville	173-SE	1940	1968
Hot Springs	182-NE	1940	--
Greystone	190-SW	1939	--
Davy Crockett Lake	181-SE	1939	1978
Flag Pond	190-SE	1939	--
Telford	190-NE	1939	1971
Erwin	199-NW	1939	1971
Unicoi	199-NE	1939	--
Chestoa	199-SW	1940	--
Huntdale	199-SE	1939	--
Sams Gap	191-NE	1939	1978
Bald Creek	200-NW	1939	1978
White Rocks Mountain	208-NE	1960	1968
Iron Mountain Gap	208-NW	1960	1968
Elizabethton	207-SW	1959	1968
Watauga Dam	207-SE	1960	--
Carvers Gap	208-SE	1960	--

Table 7. Continued.

Name of Quadrangle	Map Scale 1:24,000 TVA Number	Edition Year	Year of Photorevision
Bakersville	208-SW	1960	1978
Keenburg	207-NW	1960	--
Carter	207-NE	1938	1969
Doe	214-NW	1938	1969
Sherwood	214-SE	1938	1969
Mountain City	214-NE	1938	1978
Laurel Bloomery	213-SE	1938	1969
Grayson	219-SW	1959	--
Baldwin Gap	220-NW	1959	--
Elk Mills	214-SW	1959	--
Elk Park	215-NW	1960	1978
Holston Valley	206-SE	1960	1970 and 1978
Shady Valley	213-SW	1960	1970
Abingdon	213-NW	1960	1969 and 1978

APPENDIX C

SELECTED STREAM CHARACTERISTICS

Table 8. Selected physical and chemical characteristics of brook trout streams in Tennessee.

Stream Name	% Grade In Brook Trout Section[a]	Number of Functional Barriers[b]	Aspect	pH	Degree of Siltation[c]
Bald River	9.5	1	NW	6.3	Medium
Henderson Branch	3.2	2	W	6.4	Medium
Meadow Branch	9.0	1	SW	6.4	Heavy in Lower Stream
Roaring Branch	15.8	4	NW	6.4	Light
Rough Ridge Creek	11.9	2	SW	6.4	Heavy in Lower Stream
Fall Branch	10.0	2	NW	-	-
Little River	17.0	-	NW	6.5	-
Spruce Flats Branch	5.1	5	SW	6.7	Fairly Heavy
Sams Creek	12.6	1	NW	6.5	-
Starkey Creek	14.1	0	NE	6.9	-
Lynn Camp Prong	7.9	-	W	-	-
Marks Creek	-.4	-	SW	6.5	-
Indian Flats Prong	13.0	2	NE	6.7	-
Ridge Branch	12.5	-	NE	-	-
Seng Patch Branch	19.9	-	W	-	-
Davis Branch	5.4	-	NE	-	-
Meigs Creek	5.2	2	NW	6.5	Light
Laurel Branch	22.7	3	S	6.4	Heavy
Tanager Branch	15.2	-	SE	-	Heavy
Husky Branch	12.3	2	NE	6.5	-
Fish Camp Prong	7.6	0	NE	-	-
Goshen Prong	10.4	0	NW	6.5	-
Jenkins Creek	11.6	-	NW	-	-
Left Branch	16.6	-	W	-	-
Double Spring Branch	12.8	-	N	-	-

Table 8. Continued.

Stream Name	% Grade In Brook Trout Section[a]	Number of Functional Barriers[b]	Aspect	pH	Degree of Siltation[c]
Silers Creek	11.6	2	N	6.5	-
Narrows Branch	12.5	-	NW	-	-
Buckeye Gap Prong	9.3	-	NE	6.7	-
Small Branch	20.1	-	NW	-	-
Shelter Spring Branch	17.7	-	NW	-	-
Meigs Post Prong	23.0	2	NW	7.0	-
Sweet Creek	11.4	-	SE	6.7	-
Grouse Creek	16.0	1	NE	6.5	-
Spud Town Branch	16.4	-	N	6.7	-
Rattler Branch	20.5	-	N	-	-
Devil Branch	30.1	-	N	-	-
Snake Tongue	25.1	-	N	-	-
Kuwahi Branch	16.1	-	N	6.7	-
Love Branch	15.5	-	N	-	-
Twin Creek	9.6	-	N	-	-
Bales Branch	15.2	-	NE	-	-
Road Prong	11.0	1	NE	7.0	-
Walker Camp Prong	4.5	0	W	5.2	Light
Alum Cave Creek	4.7	-	SW	6.3	Light
Kephart Branch	11.7	1	W	6.4	Light
Dunn Creek	10.5	-	NW	6.5	Light
Middle Prong Lit. Pigeon Riv.	8.0	0	NW	7.0	-
Ramsey Prong	12.0	0	W	7.0	-
Buck Fork	11.6	1	W	6.6	-
Eagle Rocks Prong	7.9	1	NW	-	-

Table 8. Continued.

Stream Name	% Grade In Brook Trout Selection[a]	Number of Functional Barriers[b]	Aspect	pH	Degree of Siltation[c]
Laurel Top Branch	14.8	-	NE	-	-
Copper Gap Branch	11.9	-	NW	-	-
Pecks Branch	9.6	-	N	-	-
Lost Prong	18.9	-	NW	-	-
Chapman Prong	16.1	-	W	-	-
Sequoyah Branch	20.2	-	W	-	-
Cosby Creek	12.0	-	N	6.7	-
Indian Camp Creek	14.9	-	NE	7.0	Light
Otter Creek	20.5	-	NW	-	-
Copperhead Branch	22.7	-	NW	-	-
Toms Creek	14.1	-	NW	6.5	-
Sunup Branch	34.1	-	NW	-	-
Panther Branch	21.5	-	W	-	-
Rock Creek	20.4	1	NE	7.0	-
Little Rock Creek	25.3	-	NE	-	-
Middle Branch	35.6	-	NE	-	-
Camel Hump Branch	18.8	-	NE	7.0	-
Dry Branch	22.7	-	NW	-	-
	7.6	0	W	7.0	Light
Brown Gap Creek	10.6	0	NW	7.0	Very Light
Clear Fork	10.4	0	NE	6.3	Medium
Higgins Creek	7.6	3	E	7.0	Slight
Birchfield Camp Branch	17.4	0	NE	7.3	Heavy
Rocky Fork	6.3	1	SE	6.5	Very Light
Blockstand Creek	8.7	1	E	7.0	Very Light

Table 8. Continued.

Stream Name	% Grade In Brook Trout Selection[a]	Number of Functional Barriers[b]	Aspect	pH	Degree of Siltation[c]
Broad Branch	9.5	-	SW	-	-
Fort Davie Creek	15.8	-	SE	7.0	Light
Jones Branch	7.4	3	SW	6.3	Medium
Doe River	4.5	0	NE	7.5	Heavy
Little Laurel Fork	5.9	2	SW	6.7	Medium Heavy
Leonard Branch	6.5	1	NE	6.3	Medium
Wagner Branch	7.3	4	SW	6.5	Moderate
Moreland Branch	6.2	1	NE	6.6	Moderate
White Rocks Branch	6.9	0	NE	-	-
Cook Branch	4.5	-	SW	7.3	Medium
Camp Fifteen Branch	4.8	0	NE	7.3	Moderately Heavy
Bitter End Branch	9.5	-	N	-	-
Camp Ten Branch	3.0	0	SW	7.3	Medium Heavy
Clarke Creek	5.3	2	N	7.5	Slight
Tiger Creek	5.1	-	NW	7.5	Medium to Heavy
Roberts Hollow	9.4	0	NE	7.5	Light
Bill Creek	6.5	0	NE	7.3	Medium
Fall Branch	11.6	1	NE	7.3	Medium
Ruins Branch	6.5	-	N	-	-
No-Name Creek	1.6	-	SE	-	-
George Creek	7.4	1	NE	7.3	Slight
Heaton Creek	9.5	0	N	7.0	Light
Toms Branch	10.5	0	N	7.5	Medium
Middle Branch	11.6	0	N	7.5	Fairly Heavy
Right Prong Middle Branch	17.0	2	N	-	-

Table 8. Continued.

Stream Name	% Grade In Brook Trout Selection[a]	Number of Functional Barriers[b]	Aspect	pH	Degree of Siltation[c]
Panther Branch	6.2	-	SE	7.0	Very Light
Cove Creek	12.6	-	N	7.5	Light
Little Cove Creek	11.2	1	N	7.0	Light
Duck Branch	7.6	-	NE	-	Heavy
Stony Creek	9.0	0	SW	6.0	Slight
Little Stony Creek	6.5	1	S	7.0	Slight
North Fork Stony Creek	8.4	0	SW	6.5	Slight
Pole Branch	15.2	0	S	-	-
Mill Creek	7.0	0	NW	6.5	Heavy
Vaught Creek	4.9	0	NW	7.3	-
Furnace Creek	8.9	0	NW	6.8	-
East Fork	5.7	-	SW	-	-
Corn Creek	8.8	0	SE	7.3	Light
Cress Branch	7.3	0	SE	-	-
Payne Hollow	13.6	0	SW	7.0	Very Heavy
Little Laurel Branch	10.7	3	N	7.3	-
Morgan Branch	9.5	0	NE	7.3	Medium
Rockhouse Run	7.0	1	N	-	-
Tank Hollow	9.9	2	NW	7.1	Light
Chalk Branch	7.1	1	NW	6.2	Light
Maple Branch	8.4	2	N	6.5	Slight
Fagall Branch	6.7	1	NW	6.8	Slight
Birch Branch	5.5	0	NW	-	Very Light
Parks Branch	6.0	0	NW	6.3	Light
Heaberlin Branch	10.4	1	SE	6.7	Slight

Table 8. Continued.

Stream Name	% Grade In Brook Trout Selection[a]	Number of Functional Barriers[b]	Aspect	pH	Degree of Siltation[c]
Johnson Blevins Branch	6.8	0	NW	-	Light
Jim Wright Branch	9.1	0	NW	7.3	Fairly Heavy
East Fork Beaverdam Creek	9.2	1	NW	6.9	Fairly Light
Valley Creek	14.2	-	NW	-	None
Richardson Branch	9.5	-	NW	-	-
Gentry Creek	6.3	1	SW	6.7	Slight
Grindstone Branch	7.2	0	NE	6.9	Fairly Light
Kate Branch	7.0	1	SW	7.0	Fairly Light
Gilbert Branch	8.0	0	W	-	-
Hoot Owl Hollow	3.3	0	SE	-	Light

[a]Determined for the section of the stream in which brook trout occur only.

[b]A functional barrier is generally defined as a waterfall that has at least 2.4 m (8.0 ft) vertical drop. However, some streams have man-made barriers, and others have large cascades areas that may also be considered barriers to fish movement.

[c]Based on a visual estimation made by the person surveying the stream.

VITA

Rick Dwain Bivens was born in Maryville, Tennessee on November 14, 1949. After having attended elementary school in Friendsville, Tennessee, he graduated from Friendsville High School in 1967. He attended vocational school from 1967 to 1969 in Knoxville, Tennessee. In June 1970, he entered the United States Navy and was honorably discharged in June 1974.

He received his Bachelor of Science degree from The University of Tennessee, Knoxville, in Wildlife and Fisheries Science in August 1978. In December of 1984 he received his Master of Science degree in Wildlife and Fisheries Science, with an emphasis in fisheries, also from The University of Tennessee, Knoxville.

He is presently employed with the Fish Data Collection Section of the Tennessee Wildlife Resources Agency. He is a member of the American Fisheries Society, The Wildlife Society, and Xi Sigma Pi.

Rick was married to the former Nora C. Norden of Maryville, Tennessee on September 4, 1971. Rick and Nora have one son, Dwain Emory.