

**PA FISH AND BOAT COMMISSION
COMMENTS AND RECOMMENDATIONS**

November 15, 2012

WATER: Big Spring Creek (707B) Cumberland County

EXAMINED: July to September 2002 through 2008

BY: Fisheries Management Area 7 and Coldwater Unit staff

Bureau Director Action: _____ Date: _____
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Division Chief Action: _____ Date: _____
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CW Unit Leader Action: _____ Date: _____
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AREA COMMENTS:

Big Spring Creek is an 8.2 km (5.1 mi) long limestone spring stream located in sub-subbasin 7B. The stream forms a portion of the boundary between West Pennsboro and North Newton townships, Cumberland County along its entire length. Sections 01, 02, 03 and 05 of Big Spring Creek have been monitored annually from 2002 to 2008 to document changes in the fish populations following the closure of the Pennsylvania Fish and Boat Commission's Big Spring Fish Culture Station in November 2001.

AREA RECOMMENDATIONS:

1. Continue to manage Big Spring Creek, Section 01, as a Class A wild trout water with Catch-and-Release Fly-Fishing Only regulations and no stocking of hatchery trout.
2. The Pennsylvania Department of Environmental Protection through 25 PA Code Chapter 93 Water Quality Standards currently classifies the existing use of the portion of Big Spring Creek in Section 01 from SR 3007 (Big Spring Road Bridge) downstream to the former Piper Mill Dam previously located at RM 4.47 as High Quality - Cold Water Fishes, Migratory Fishes based on the presence of a Commission approved Class A wild brook trout population. Provide a copy of this report to the Pennsylvania Department of Environmental Protection through the Pennsylvania Fish and Boat Commission's Division of Environmental Services. Pennsylvania Department of Environmental Protection action should be taken to upgrade this classification from "Existing Use" to "Designated Use".

3. Submit a recommendation to the Pennsylvania Fish and Boat Commission Board of Commissioners to designate Big Spring Creek, Section 02, as a Class A wild rainbow trout water from the former Piper Mill Dam (old fish barrier) downstream to the former Strohm Dam at Nealy Road.
4. Pending Commission approval of Class A status for Section 02 of Big Spring Creek, provide a copy of this report to the Pennsylvania Department of Environmental Protection through the Pennsylvania Fish and Boat Commission's Environmental Services Division for a 25 PA Code Chapter 93 upgrade from Cold Water Fishes, Migratory Fishes to High Quality - Cold Water Fishes, Migratory Fishes from the former Piper Mill Dam (old fish barrier) downstream to the former Strohm Dam at Nealy Road (Environmental Services Division action needed).
5. Continue to manage Big Spring Creek, Section 02, as a self-sustaining wild trout water with Catch-and-Release Fly-Fishing Only regulations and no stocking of hatchery trout.
6. Continue to manage Big Spring Creek, sections 03 and 04, as Approved Trout Waters with annual plants of hatchery brook trout and regulated with Commonwealth Inland Waters angling regulations.
7. Fisheries Management should re-inventory Big Spring Creek, sections 01-03 and 05, every five years to track population changes (next survey scheduled for 2013).
8. Request that the Pennsylvania Fish and Boat Commission, Division of Habitat Management, continue to conduct habitat improvement work where feasible at Big Spring Creek. It is preferable to take a watershed approach by beginning enhancement work in the headwaters and progressing in a downstream manner, with the intent of expanding the wild brook and rainbow trout populations (Division of Habitat Management action needed).

This work made possible by funding from the Sport Fish Restoration Act Project F-57-R Fisheries Management.

**Pennsylvania Fish and Boat Commission
Bureau of Fisheries
Fisheries Management Division**

Big Spring Creek (707B)
Sections 01, 02, 03, 05
Management Report

Prepared by
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Fisheries Management Area 7

Fisheries Management Database Name: Big Spring Creek
Lat/Lon: 40°11'19"/77°23'32"

Date Sampled: 2002 - 2008

Date Prepared: May 2011

Introduction

Big Spring Creek is an 8.2 km (5.1 mi) long limestone spring stream located in sub-subbasin 7B. Along its length, the stream forms a portion of the boundary between West Pennsboro and North Newton townships, Cumberland County. Big Spring Creek originates from a large spring source located at approximately 155 m (509 ft) elevation, 4.6 km (2.9 miles) south of Newville, Pennsylvania, and flows north to its confluence with the Conodoguinet Creek at River- Mile (RM) 56.54, 40°11'19" latitude and 77°23'32" longitude. Map coverage is provided by the Newville, Pennsylvania, United States Geological Survey 7.5 minute Quadrangle (Figure 1).

The Pennsylvania Department of Environmental Protection (PADEP) 25 PA Code Chapter 93 Water Quality Standards currently designates Big Spring Creek as Exceptional Value, Migratory Fishes (EV, MF) from the source downstream to SR 3007 (Big Spring Road Bridge) a distance of 319 m (1047 ft) and Cold Water Fishes, Migratory Fishes (CWF, MF) from SR 3007 downstream to the mouth a distance of 7.9 km (4.9 mi). Additionally, the PADEP currently offers existing use protection through 25 PA Code Chapter 93 Water Quality Standard of High Quality - Cold Water Fishes, Migratory Fishes (HQ-CWF, MF) to the portion of Big Spring Creek from SR 3007 (Big Spring Road Bridge) downstream to the former Piper Mill Dam previously located at RM 4.47; a distance of 631 m (0.39 mi). The CWF, MF designation provides

protection for the maintenance and propagation, or both, of fish species including the family Salmonidae and additional flora and fauna, which are indigenous to a cold water habitat, as well as, passage, maintenance and propagation of anadromous and catadromous fishes and other fishes which move to or from flowing waters to complete their life cycle in other waters. The HQ-CWF, MF designation not only provides protection afforded by the CWF, MF designation, but also places more stringent antidegradation requirements on any new, or increased discharges proposed for this reach of the Big Spring Creek. The EV, MF designation is applied to surface waters of exceptional ecological significance and affords the most stringent antidegradation protection available to Commonwealth waters.

The Pennsylvania Fish and Boat Commission (PFBC) purchased the spring and the land adjacent to the upper 4.2 km (2.6 mi) of the stream in the late-1960s to establish the Big Spring Fish Culture Station (BSFCS) and to ensure public access to the stream for recreational angling and boating opportunities. The BSFCS began operation in 1972 and raised between 750,000 and 800,000 catchable size trout annually for planting into Commonwealth waters prior to being decommissioned in November 2001. Numerous surveys have been conducted at Big Spring Creek to document the population of both wild and hatchery trout. This document summarizes the findings from annual electrofishing surveys conducted at historic locations following the closure of the BSFCS in 2001 and will include the period of record from 2002 to 2008.

Big Spring Creek is divided into five stream sections for fisheries management purposes. Section 01 extends 0.95 km (0.59 mi) from the spring source to the former Piper Mill Dam previously located at RM 4.47. Section 02 extends 1.5 km (0.93 mi) from the former Piper Mill Dam downstream to the Nealy Road Bridge at RM 3.54. Sections 01 and 02 are currently managed by the PFBC with Catch-and-Release Fly Fishing Only Regulations. These regulations allow for year-round angling utilizing fly fishing tackle and no trout may be killed or had in possession. Section 03 extends 1.63 km (1.01 mi) from the Nealy Road Bridge downstream to the Stone Arch Bridge on SR 3007 located at RM 2.53. Section 04 extends 2.03 km (1.26 mi) from the Stone Arch Bridge on SR 3007 downstream to the SR 0641 Bridge in Newville, Pennsylvania, located at RM 1.27. Sections 03 and 04 are included in the PFBC Approved Trout Water (ATW) program and receive annual plants of adult brook trout *Salvelinus fontinalis*, and are managed by the PFBC with Commonwealth Inland Waters angling regulations. These regulations allow for angling and harvest of trout with a five trout per day creel limit and seven-inch (178 mm) minimum length limit from the opening day of trout season to Labor Day, and from the day after Labor Day to

the last day of February permit a daily harvest of three trout under the seven-inch minimum length limit. No angling is permitted from March 1 to 8 a.m. on the opening day of trout season. Section 05 extends 2.04 km (1.27 mi) from the SR 0641 Bridge downstream to the mouth. Section 05 is not stocked with trout by the PFBC, and is managed with the previously described Commonwealth Inland Waters angling regulations. Surveys have been conducted at sampling stations located in sections 01, 02, 03, and 05 annually from 2002 - 2008 (Table 1).

The PFBC also surveyed Big Spring Creek at sampling stations distributed along the length of the entire stream from 1957 to 1960 to evaluate the wild trout population present in the stream as well as evaluate the contribution of stocked trout to the population (Simes 1957; Simes 1960). Comparisons will be made among these surveys and the more recent surveys when sampling stations overlapped or were in close proximity.

Methods

The examination of Big Spring Creek has been conducted annually between July 30 and September 16 from 2002 through 2008 to quantify the wild brook trout, brown trout *Salmo trutta*, and rainbow trout *Oncorhynchus mykiss* populations, as well as determine the contribution of hatchery stocked fingerling and adult brook trout to the population. All procedures were carried out according to those outlined by Marcinko et al. (1986). To facilitate differentiation from wild brook trout residing in the creek, all fingerling brook trout stocked (24,200 total) by the PFBC into sections 02 - 04 from 2004 to 2007 were marked by removing the left pelvic fin (Frederick 2011). Additionally, adult brook trout stocked (11,800 total) by the PFBC into sections 03 and 04 from 2004 to 2007 were marked by removing the adipose fin. Two representative sampling stations were surveyed in Section 01 (RM 4.96 - 150 m; RM 4.77 - 300 m) totaling 47.4% of the section length. One representative sampling station was surveyed in Section 02 (RM 4.29 - 300m) totaling 20.0% of the section length. One 100 m station was sampled in each of sections 03 and 05 for the purpose of conducting an index of biotic integrity (IBI) and comprised 6.13% and 4.90% of the stream section lengths, respectively. Additionally, an IBI was also conducted within the first 100 m of electrofishing stations located at RM 4.77 and RM 4.29.

Fish communities were sampled using a towed boat electrofishing unit equipped with a Pow'r Gard model 1736DCV generator designed to deliver 125 volts of straight DC current. Salmonids were the target species and total species composition and relative abundance of non-target species were determined. Scientific and common fish names reference the Integrated Taxonomic Information

System (<http://www.itis.gov>). Captured trout were measured and recorded in 25 millimeter (1.0 in) length groups and examined for adipose or left pelvic fin marks to differentiate between hatchery versus wild trout. Statewide average weights calculated for each length group were used to generate the biomass (kg/ha) estimate for all trout captured. All fish captured were identified, recorded for species occurrence and released at the site of capture. All captured trout were given an identifying upper caudal fin clip during the initial electrofishing pass to facilitate a mark-recapture population estimate. Trout densities were determined using the Chapman (1951) modification of the Petersen estimator (omitting -1, which has no practical significance; Ricker 1975):

$$\hat{N} = \frac{(M+1)(C+1)}{(R+1)},$$

where M is the number of fish marked and released during the first electrofishing pass, C is the number captured and examined for marks during the second pass, and R is the number of recaptures during the second pass of previously marked fish (Van Den Avyle and Hayward 1999). The Chapman modification of the Petersen estimator provides nearly unbiased population estimates when $(M + C) \geq N$ and a nearly unbiased estimate when at least seven recaptures per 25-mm length group of marked individuals ($R \geq 7$) are collected during the second electrofishing pass (Krebs 1989). However, Ricker (1975) reported that the probability of statistical bias can be ignored if at least three to four individuals are recaptured. As such, the Chapman modification of the Petersen estimator was used to determine population estimates when there were at least three recaptures. If fewer than three individuals per 25-mm length group were recaptured, the population estimate was determined by the sum of the catch of unique individuals captured during the marking and recapture runs and no confidence intervals were determined.

Results

Section 01

Station 0101 - RM 4.96

Station 0101, locally known as the "Ditch" was located downstream from the spring source and began at the McCracken Mill Dam at 40°07'47" latitude and 77°24'27" longitude (see Table 1). All of the stop logs used to maintain the water level in the Ditch were removed either one-day prior to, or the morning of, the survey to decrease water depth in the sampling station and facilitate workable conditions. The 150 m (492 ft)

long station averaged 9.9 m (32.5 ft) wide and comprised 15.8% of the section length. The west bank of the sampling station was characterized by a manicured field to provide easy access and angling conditions to the stream. A sparse tree lined bank provided limited shading to the stream along the east bank. Extensive habitat improvement work in the form of mud sill cribbing and numerous log vanes deflectors (Karl Lutz, PFBC, personal communication) was constructed within this station. Flowing water habitat, when the stop logs are in place, consisted of a single, long deep pool with a maximum depth of approximately 1.8 m (6 ft); characteristic of a small impoundment. Water depth, overhead cover attributable to the mud sill and single log vanes, and large mats of elodea *Elodea canadensis* provided the majority of suitable adult trout habitat.

Seven fish species were captured at this station during surveys conducted between 2002 and 2008. Brook trout, brown trout and rainbow trout were captured regularly during the annual surveys while pearl dace *Margariscus margarita*, slimy sculpin *Cottus cognatus*, white sucker *Catostomus commersonii*, and tiger trout *Salmo trutta* X *Salvelinus fontinalis* were captured only periodically at this sampling station (Table 2).

Brook trout. - Following an initial decline in the brook trout biomass from 148.58 kg/ha to 55.89 kg/ha between 2002 and 2003, brook trout biomass at this station increased annually. During 2008, the estimated biomass of wild brook trout was 297.45 kg/ha, the highest documented during the period of record. Additionally, estimated wild brook trout biomass of fish greater than or equal to 175 mm (7.0 in) ranged from 42.05 kg/ha during 2003 to 257.53 kg/ha during 2008, while the biomass of wild brook trout less than 175 mm (7.0 in) ranged from 13.62 kg/ha during 2004 to 64.66 kg/ha during 2007 (Figure 2; Appendix A).

The number of individual brook trout captured during both passes of the two-pass mark-recapture electrofishing surveys ranged from 140 during 2003 to 590 individuals during 2007 and were between 50 mm (2.0 in) to 424 mm (16.7 in) in total length (Appendix B). The percent of quality length (≥ 200 mm; Anderson 1980) brook trout of the total number of brook trout captured varied through the period of record and ranged from 18.9% during 2005 to 49.0% during 2002. Throughout the survey period from 2002 to 2008, 2,117 individual brook trout were captured, of which 621 (29.3%) were greater than or equal to quality length.

Rainbow trout. - Following an initial decline in the rainbow trout biomass from 658.97 kg/ha to 83.03 kg/ha between 2002 and 2003, rainbow trout biomass at this station fluctuated annually from a low of 30.86 kg/ha during 2006 to a high of 90.54 kg/ha

during 2007. During 2008, the estimated biomass of wild rainbow trout was 87.02 kg/ha. Additionally, estimated wild rainbow trout biomass of fish greater than or equal to 175 mm (7.0 in) ranged from 26.22 kg/ha during 2006 to 649.93 kg/ha during 2002, while the biomass of wild rainbow trout less than 175 mm (7.0 in) ranged from 0.50 kg/ha during 2008 to 9.04 kg/ha during 2002 (see Figure 2; see Appendix A).

The number of individual rainbow trout captured during both passes of the two-pass mark-recapture electrofishing surveys ranged from 31 during 2005 to 154 individuals during 2002 and were between 50 mm (2.0 in) and 674 mm (26.6 in) in total length (see Figure 2; see Appendix B). The percent of quality length (≥ 400 mm; D.G. Simpkins and W.A. Hubert, unpublished) rainbow trout of the total number of rainbow trout captured was generally low through the period of record and ranged from 0.0% during 2004, 2005, and 2006 to 37.0% during 2002. Throughout the survey period from 2002 to 2008, 425 individual rainbow trout were captured, of which 64 (15.1%) were greater than or equal to quality length (see Figure 2; see Appendix A).

Brown trout. - During 2002, the estimated biomass of brown trout in Station 0101 was 661.53 kg/ha, after which the population declined substantially (see Figure 2; see Appendix A). During subsequent surveys annually conducted from 2003 to 2008, the total number of brown trout captured was insufficient to generate reliable biomass estimates, and less than 10 individuals were captured annually since 2004. Only two sub-legal length (< 175 mm) wild brown trout were captured at Station 0101 from 2002 through 2008, and these fish were documented during 2002 and 2003 surveys.

The number of individual brown trout captured during both passes of the two-pass mark-recapture electrofishing surveys ranged from two during 2008 to 112 individuals during 2002 and were between 50 mm (2.0 in) and 599 mm (23.6 in) in total length (see Appendix B). The percent of quality length (≥ 230 mm; Milewski and Brown 1994) brown trout of the total number of brown trout captured was high throughout the period of record and ranged from 95.5% during 2003 to 100.0% from 2004 to 2008. Throughout the survey period from 2002 to 2008, 162 individual brown trout were captured, of which 160 (98.8%) were greater than or equal to quality length.

Hatchery trout. - Low numbers of hatchery reared trout have been captured from this station throughout the survey period. With the exception of a tiger trout captured in 2002, a distinction between hatchery reared and wild trout was not made during the 2002 and 2003 surveys. From 2004 through 2008 a total of 24

hatchery trout have been captured during the combined annual surveys of Station 0101.

Station 0102 - RM 4.77

Station 0102, was located 300 m downstream from the McCracken Mill Dam at 40°07'56" latitude and 77°24'27" longitude (see Table 1). The 300 m (984 ft) long station averaged 15.2 m (49.9 ft) wide and comprised 31.6% of the section length. The east bank was loosely paralleled by Big Spring Road (SR 3007) along most of the station length, while a woodlot provided a small buffer from agricultural and rural residential activities along the western bank. Extensive habitat improvement work in the form of numerous log vane deflectors, overhead cover deflectors, and a channel block (Karl Lutz, PFBC, personal communication) was constructed within this station. Flowing water habitat consisted of a series of short and shallow (0.20 m; 0.66 ft) riffles, medium-length runs up to 0.40 m (1.31 ft) deep, and slow moving deep-water (0.50 m; 1.64 ft) along the stream margins. Water depth and the overhead cover attributable to the habitat improvement devices and overhanging trees, grasses, and shrubs provided suitable adult trout habitat.

Six fish species, common in coldwater environments, were captured at Station 0102 during surveys conducted between 2002 and 2008. Brook, brown, and rainbow trout along with, slimy sculpin were captured regularly during the annual surveys, while pearl dace and white sucker were captured only periodically at this sampling station (Table 3).

Brook trout. - Brook trout biomass at Station 0102 increased annually from 2002 through 2006 (Figure 3; Appendix C). A slight decline in brook trout biomass was documented between 2006 and 2007, as well as between 2007 and 2008. Brook trout biomass was estimated to be 5.21 kg/ha in 2002 and 45.24 kg/ha in 2006, nearly a nine-fold increase over that time period. During 2008, the estimated biomass of wild brook trout was 34.31 kg/ha. Additionally, estimated wild brook trout biomass of fish less 175 mm (7.0 in) ranged from 1.20 kg/ha during 2002 to 10.67 kg/ha during 2005.

The number of individual brook trout captured during both passes of the two-pass mark-recapture electrofishing surveys ranged from 78 during 2003 to 245 individuals during 2007 and were between 50 mm (2.0 in) to 424 mm (16.7 in) in total length (Appendix D). The percent of quality length (≥ 200 mm) brook trout of the total number of brook trout captured varied through the period of record and ranged from 13.6% during 2002 to 33.8% during 2008. Throughout the survey period from 2002 to 2008,

1,010 individual brook trout were captured, of which 242 (24.0%) were greater than or equal to quality length.

Rainbow trout. - Following an initial decline in the rainbow trout biomass from 49.36 kg/ha to 15.45 kg/ha between 2002 and 2003, the rainbow trout biomass at Station 0102 increased annually through 2006 before declining slightly in 2007 and 2008 (see Figure 3; see Appendix C). During 2008, the estimated biomass of wild rainbow trout was 23.78 kg/ha. Additionally, estimated wild rainbow trout biomass of fish less than 175 mm (7.0 in) fluctuated from 2002 to 2008 and ranged from 1.10 kg/ha during 2008 to 11.24 kg/ha during 2006.

The number of individual rainbow trout captured during both passes of the two-pass mark-recapture electrofishing surveys ranged from 52 during 2008 to 170 individuals during 2006 and were between 75 mm (3.0 in) and 599 mm (23.6 in) in total length (see Appendix D). The percent of quality length (≥ 400 mm) rainbow trout of the total number of rainbow trout captured was generally low through the period of record and ranged from 0.0% during 2007 to 8.3% during 2002. Throughout the survey period from 2002 to 2008, 728 individual rainbow trout were captured, of which 19 (2.6%) were greater than or equal to quality length.

Brown trout. - During surveys annually conducted at Station 0102 from 2002 to 2008, the total number of brown trout captured was insufficient to generate reliable biomass estimates, and less than 10 individuals were captured annually (see Figure 3; see Appendix D). The number of individual brown trout captured during both passes of the two-pass mark-recapture electrofishing surveys ranged from two during 2008 to eight individuals during 2002 and 2007. Brown trout ranged in total length from 75 mm (3.0 in) to 624 mm (24.6 in). The percent of quality length (≥ 230 mm) brown trout of the total number of brown trout captured was high throughout the period of record and ranged from 60.0% during 2003 to 100.0% during 2004, 2005, 2007, and 2008. Throughout the survey period from 2002 to 2008, 40 individual brown trout were captured, of which 34 (85.0%) were greater than or equal to quality length.

Hatchery trout. - Low numbers of hatchery reared trout have been captured from this station throughout the survey period. A distinction between hatchery reared and wild trout was not made during the 2002 and 2003 surveys. From 2004 through 2008 a total of 85 hatchery trout were captured during the combined annual surveys of Station 0102. The majority of these fish were captured during 2006 and 2007 and consisted primarily of brook trout stocked as fingerlings and were less than 150 mm (5.9 in) in total length.

1958 survey. - Station 0102 was also surveyed by the PFBC in 1958. Based on the site description provided by Simes (1960), the sampling station was nearly identical with the current station. During the surveys conducted from 1957 to 1960, trout captured were categorized into only two length groups: adults (≥ 6 in) and fingerlings (< 6 in). Simes (1960) estimated that 444 adult brook trout/acre and 195 fingerling brook trout/acre resided in Station 0102 at the time of the survey. Additionally, brown trout density was estimated to be three adult brown trout/acre at this sampling station. Total trout density (adults and fingerling brook and brown trout) during the 1958 survey was estimated to be 641 trout/acre (Simes 1960), while estimated total trout density (including fingerling and adult brook, brown and rainbow trout) during the period from 2002 to 2008 ranged from 179 trout/acre during 2004 to 462 trout/acre during 2007. Total trout density during the 2008 survey at this station was estimated to be 252 trout/acre, and was comprised primarily of fingerling trout. The 2008 survey documented an estimated 110 adult trout/acre and an estimated 142 fingerling trout/acre. Brook trout densities were estimated at 70 adult trout/acre and 135 fingerling trout/acre during 2008.

Section 02

Station 0201 - RM 4.29

Station 0201, was located 300 m downstream from the former Piper Mill Dam (old fish barrier) at 40°08'20" latitude and 77°24'24" longitude (see Table 1). The 300 m (984 ft) long station averaged 11.1 m (36.4 ft) wide and comprised 20.0% of the section length. Big Spring Road (SR 3007) closely paralleled the station for most of its length along the eastern bank, while along the western bank a woodlot provided a buffer from agricultural and rural residential activities. Minimal habitat enhancement occurred in the upstream-most portion of this station during the past in the form of instream random boulder placement. Flowing water habitat consisted of one long riffle downstream from the remnants of the Piper Mill Dam, and a short riffle downstream from the remnants of the Thomas Hatchery Dam separated by relatively flat, shallow (0.20 - 0.40 m; 0.7 - 1.3 ft deep) water. Pockets of slightly deeper water associated with the boulders, turbulence in the riffle areas, and overhead cover from overhanging trees and shrubs along the stream margins provided limited habitat for adult trout.

Six fish species, common in coldwater environments, were captured at Station 0201 during surveys conducted between 2002 and 2008. Brook, brown, and rainbow trout were captured regularly during the annual surveys. Slimy sculpins were

captured during five out of the seven years, while pearl dace and white sucker were captured less frequently from this sampling station (Table 4).

Brook trout - Brook trout were captured in insufficient numbers at this station to generate biomass estimates throughout the survey period. The number of individual brook trout captured during both passes of the two-pass mark-recapture electrofishing surveys ranged from zero during 2002 to 21 individuals during 2003 and were between 75 mm (2.0 in) to 399 mm (15.7 in) in total length (Figure 4; Appendix F). Throughout the survey period from 2002 to 2008, 62 individual brook trout were captured, of which 11 (17.7%) were greater than or equal to quality length (≥ 200 mm).

Rainbow trout - From 2002 through 2008 the rainbow trout biomass fluctuated from a low of 23.36 kg/ha in 2003 to a high of 130.82 kg/ha in 2005 with no apparent trend (see Figure 4; Appendix E). During 2008, the estimated biomass of wild rainbow trout was 69.05 kg/ha. Additionally, estimated wild rainbow trout biomass of fish less than 175 mm (7.0 in) fluctuated from 2002 to 2008 and ranged from 3.23 kg/ha during 2003 to 24.04 kg/ha during 2006.

The number of individual rainbow trout captured during both passes of the two-pass mark-recapture electrofishing surveys ranged from 57 during 2003 to 269 individuals during 2002 and were between 50 mm (2.0 in) and 649 mm (25.6 in) in total length (see Appendix F). The percent of quality length (≥ 400 mm) rainbow trout of the total number of rainbow trout captured was generally low throughout the period of record and ranged from 1.1% during 2002 to 3.5% during 2003 and 2005. Throughout the survey period from 2002 to 2008, 1,330 individual rainbow trout were captured, of which 29 (2.2%) were greater than or equal to quality length.

Brown trout - During surveys annually conducted at Station 0201 from 2002 to 2008, the total number of brown trout captured was insufficient to generate reliable biomass estimates and was characterized by a declining trend following a peak in 2005 (see Figure 4; see Appendix F). The number of individual brown trout captured during both passes of the two-pass mark-recapture electrofishing surveys ranged from two during 2007 to 20 individuals during 2004. Brown trout ranged in total length from 75 mm (3.0 in) to 649 mm (25.6 in). The percent of quality length (≥ 230 mm) brown trout of the total number of brown trout captured was high throughout the period of record and ranged from 29.4% during 2003 to 100.0% during 2002 and 2005. Throughout the survey period from 2002 to 2008, 61 individual

brown trout were captured, of which 37 (60.7%) were greater than or equal to quality length.

Hatchery trout - Low numbers of hatchery reared trout have been captured from this station throughout the survey period. A distinction between hatchery reared and wild trout was not made during the 2002 and 2003 surveys. From 2004 through 2008 a total of 40 hatchery trout was captured during the combined annual surveys of Station 0201. The majority of these fish were captured during 2006 and 2007 and consisted primarily of brook trout stocked as fingerlings that were less than 175 mm (6.9 in) in total length.

Section 03

Station 0301 - RM 2.53

Station 0301 was located at the Stone Arch Bridge on Big Spring road (SR 3007) at 40°09'44" latitude and 77°24'21" longitude (see Table 1). The 100 m (328 ft) long station averaged 9.8 m (32.2 ft) in width and comprised 6.1% of the section length. The station was bordered by a thin buffer of trees and a rural residence on the west bank. The tree-lined portions of the station provided partial shading to the stream.

Flowing water habitat at this station was predominantly a relatively deep (1.25 m; 4.1 ft) and long run with limited shallow-water habitat at the stream margins. Substrate was characterized by a thick layer of silt colonized by dense seasonal patches of aquatic macrophytes. Some large woody debris was present in the form of root wads and a single downed tree. The deep-water areas throughout the station, large woody debris, and seasonal patches of aquatic vegetation provided limited habitat for adult trout.

A total of 11 fish species was captured at Station 0301 between 2002 and 2008. Blacknose dace, white sucker and pearl dace were captured annually throughout the seven-year survey period. Fourspine stickleback *Apeltes quadracus* were captured six out of the seven years surveyed, while a single American eel *Anguilla rostrata* was captured from this station in 2003 (Table 5). Five wild trout (two rainbow trout and three brown trout) were captured from this station between 2002 and 2008. No wild brook trout were captured from this station throughout the survey period.

1957 survey. - Electrofishing was also conducted at this station during October 1957 (Simes 1957). During this survey the station began at the same location but extended an additional 174 m upstream. During 1957, five adult (\geq 152 mm; 6 in.)

rainbow trout, three fingerling (< 152 mm; 6 in.) rainbow trout, and one adult brown trout were captured. No brook trout were captured during this survey (Simes 1957).

Section 05

Station 0501 - RM 1.22

Station 0501 was located 112 m downstream from the SR 0641 bridge in Newville, Pennsylvania; 40°10'30" latitude and 77°23'41" longitude (see Table 1). The 100 m (328 ft) long station averaged 5.50 m (18.1 ft) in width and was bordered by a thin buffer of trees, manicured lawns, and a residential gravel parking area. The tree-lined portions of the station provided partial shading to the stream.

The station was characterized primarily by shallow riffles up to 0.40 m (1.3 ft) deep separated by small pools (to 0.75 m ; 2.5 ft deep) and runs (to 0.50 m; 1.6 ft deep). A stone wall forms approximately two-thirds of the eastern bank within this station. Relatively deep-water areas in the pools and runs, as well as seasonal patches of aquatic macrophytes provided habitat for adult trout.

A total of 19 fish species was captured at Station 0501 between 2002 and 2008. Fish common in coldwater, transitional and warmwater environments were present in the species composition (Table 6). A total of 40 wild trout (20 rainbow trout and 20 brown trout) was captured from this station from 2002 through 2008. No wild brook trout were captured from this station throughout the survey period; however, seven hatchery reared brook trout, as well 11 hatchery rainbow trout were captured.

1957 survey. - Electrofishing was also conducted in the vicinity of Station 0501 in 1957. Results from this survey documented 26 adult and 18 fingerling rainbow trout, two adult brown trout, and one adult brook trout. One adult trout of each species was determined to have been of hatchery origin due to the presence of an identifying fin (Simes 1957).

Discussion

Station 0101

Following the closure of the Big Spring Fish Culture Station in 2001, the biomass for all trout species in Station 0101 (Ditch) decreased dramatically through 2003. Since 2003 the brown trout and rainbow trout biomass continued to decrease through 2006 before experiencing a slight biomass increase in 2007, and again decreasing in 2008 (see Figure 2). Examination of the 2002

length-frequency table reveals a population of brown trout that consisted of only larger (\geq 225 mm total length; 9 in.) individuals (see Appendix B). Brook trout biomass at this station has been increasing steadily since the recorded low in 2003. The 2002 length-frequency distribution characterizes a brook trout population skewed toward larger individuals (see Appendix B). The 2003 to 2008 length-frequency distributions illustrate that the brook trout population has changed through the period of record from a population comprised of similar numbers of juvenile and adult fish to a structure that is more reflective of a natural population. Particularly strong year classes were documented in 2004 and 2007. It is unclear at this time at what point the wild brook trout population will reach equilibrium in this stream reach.

In general, fish population size structures tend to be dominated by smaller, younger fish with increasingly fewer larger and older fish in the population. Immediately following the closure of the Big Spring Fish Culture Station the size structure of all three trout populations (brook, brown and rainbow) were dominated by large individuals with relatively few small fish present in the population. This reversal of the expected size structure was likely being driven in large part by the operation of the hatchery through the release of nutrients and the escapement of hatchery fish. The abundance of large trout made the Ditch a popular fly fishing destination for anglers. Through discussions with local anglers who frequent Big Spring Creek, angling in the Ditch has experienced a considerable decline since the closure of the Big Spring Fish Culture Station associated with the reduction in the abundance of large trout in that portion of the stream; however, the approximate five-fold increase in wild brook trout biomass documented from 2003 to 2008, provides excellent fly fishing opportunities for these fish in a unique environment.

Station 0102

Similar to Station 0101 the biomass of brown and rainbow trout at Station 0102 experienced an initial decrease followed by a general increase after the closure of the Big Spring Fish Culture Station (see Figure 3). Examination of the length-frequency table reveals variable recruitment success with strong rainbow trout year classes present in 2002 and 2006 (see Appendix D). The brown trout that were captured were typically large individuals ranging in lengths from 425 mm (16.7 in) to 624 mm (24.6 in) in total length, and only a total of five brown trout was captured that were less than 200 mm (8 in) in total length throughout the survey period.

Brook trout, which had the lowest biomass estimate of the three trout species in 2002 increased until 2006 and comprised the majority of the trout biomass in 2004 and has continued to dominate the trout biomass at this station (see Figure 3; see Appendix C). Examination of the length-frequency tables indicates an apparent improvement in the recruitment of wild brook trout from 2005 to 2007 as compared to 2002 to 2004 (see Appendix D). The physical habitat characteristics of Station 0102 appear to favor brook trout in this free-flowing portion of the stream.

An electrofishing survey of Station 0102 was conducted in 1958, prior to the establishment of the Big Spring Fish Culture Station. This survey documented an adult brook trout population that consisted of 444 trout/acre compared to the 2008 estimate of 70 trout/acre. Although the estimated number of adult trout/acre documented during the 1958 survey of Station 0102 was considerably greater than the 2008 estimate, it was impossible to determine the make-up of the 1958 adult population because individual fish lengths were not available to include in this analysis. It is possible that many of the brook trout captured in 1958 were just longer than six inches (the length used to differentiate between adult and fingerling trout). It is also just as possible that many of the fish were well over six inches in total length. There were also at least two sources of hatchery trout present in Big Spring Creek at the time of the survey. These sources were stocked PFBC adult trout, which were all given identifying fin clips and would have been discernable from wild trout and escapees from the Thomas Hatchery that began operation in 1953. As such, hatchery escapees had the potential to artificially inflate the number of adult trout present in Big Spring Creek during the 1958 survey.

Station 0201

Since 2002 the brook and brown trout biomass estimates have experienced some fluctuations; however, there has been no identifiable increasing or decreasing trend in the biomass of these two trout species and densities were consistently low. Although there has been some fluctuation in rainbow trout biomass there has been an increasing trend since 2002 (see Figure 4; see Appendix E). Examination of the rainbow trout length-frequency table reveals strong recruitment in four of the survey years (see Appendix F). A particularly strong year class in 2002 and relatively stable year classes during the period from 2003 to 2008 should continue to support a good rainbow trout population in this portion of the stream.

Rainbow trout is the dominant trout species in this stream reach. This is clearly a result of habitat characteristics that

favor rainbow trout. This stream reach supports two short reaches of relatively deep fast water with adjacent cover provided by overhanging vegetation. The change in stream gradient that provides the increased water velocities are the result of a remnant mill dam and an instream structure remaining from the Thomas Fish Hatchery, both of which were removed in 2009. Beyond these two short reaches of deep, fast water the habitat in this section was poor and consisted of large expanses of wide, shallow water with little or no overhead cover. During electrofishing surveys in this reach of stream the vast majority of the fish were routinely collected immediately downstream and from within the fast water areas. Almost no fish were collected from the open water portion of this stream reach. It is believed that improvements in habitat that include increases in water depth and the amount of overhead cover would result in improved distribution of fish throughout this stream reach as well as an increase in the overall biomass of trout. Extensive habitat enhancement at this station was completed in 2010, and PFBC staff will monitor the fish population beginning in 2011 to track any changes that may occur to evaluate the response of the aquatic community (Charlie McGarrell, PFBC, personal communication).

Currently, Section 02 is not designated as Class A by the PFBC. PFBC minimum criteria for designation of a Class A wild rainbow trout population is an estimated biomass of at least 2.0 kg/ha of rainbow trout less than 150 mm (5.9 in) in total length. During the period of record from 2002 to 2008, the estimated biomass of wild rainbow trout less than 150 mm (5.9 in) in total length exceeded this minimum standard four of the seven survey years and ranged from a low of 0.69 kg/ha in 2003 to 11.6 kg/ha in 2002 and the general trend was in an upward direction (see Appendix E). Although outside the scope of this document, a survey of Station 0201 was conducted in 2009 for the purposes of pre-treatment habitat enhancement monitoring. During this most recent survey, total rainbow trout biomass was estimated to be 97.0 kg/ha and was comprised of 6.62 kg/ha of wild rainbow trout less than 150 mm in total length (Table 7). Based on the 2009 survey and other surveys detailed in this report, the PFBC Board of Commissioners should consider designating Section 02 of Big Spring Creek as a Class A wild rainbow trout water.

Station 0301

Few trout have ever been captured from Station 0301, located directly above the Stone Arch Bridge. While water quality was capable of supporting trout year-round, the available instream habitat was marginal and appeared to be the primary factor limiting increased trout abundance in this reach of stream. Much of the substrate was comprised of a deep layer of silt up

to 0.5 m (1.6 ft) deep. Additionally, much of the stream banks were raw and vertical and provided no stream-margin cover. The single downed tree and the water depth provided the only cover in this stream reach; however, water velocities and the lack of instream habitat provided little cover for adult trout and ultimately appeared to be the factors precluding increased trout densities at this station. Habitat improvement that facilitates the movement of fine substrate material and provides for instream resting areas and overhead cover would likely result in an increase in trout densities at this station.

Station 0501

Located directly downstream of the Laughlin Mill Dam in Newville, Pennsylvania, Station 0501 has historically supported a low density wild trout population comprised of brown and rainbow trout. Electrofishing surveys conducted at this station since 1957 have never documented the presence of wild brook trout. The warming effect of the Laughlin Mill Dam is the likely cause for the lack of brook trout and the depressed trout populations in this reach of Big Spring Creek. Evidence of the warming effects of the dam can also be seen in the fish species assemblage, which includes warmwater and coolwater species including banded killifish *Fundulus diaphanus*, green sunfish *Lepomis cyanellus* and smallmouth bass *Micropterus dolomieu*, among others (see Table 6). Removal of the Laughlin Mill Dam would result in lower water temperatures downstream of the dam, which would provide for free movement of fish throughout the Big Spring Creek watershed. A subsequent lowering of the water temperature would result, which would likely result in the expansion of the wild trout populations in this reach of Big Spring Creek.

Management Recommendations

1. Continue to manage Big Spring Creek, Section 01, as a Class A wild trout water with Catch-and-Release Fly-Fishing Only regulations and no stocking of hatchery trout.
2. The Pennsylvania Department of Environmental Protection through 25 PA Code Chapter 93 Water Quality Standards currently classifies the existing use of the portion of Big Spring Creek in Section 01 from SR 3007 (Big Spring Road Bridge) downstream to the former Piper Mill Dam previously located at RM 4.47 as High Quality - Cold Water Fishes, Migratory Fishes based on the presence of a Commission approved Class A wild brook trout population. Provide a copy of this report to the Pennsylvania Department of Environmental Protection through the Pennsylvania Fish and Boat Commission's Division of Environmental Services. Pennsylvania Department of Environmental Protection action should be taken to upgrade this classification from "Existing Use" to "Designated Use".
3. Submit a recommendation to the Pennsylvania Fish and Boat Commission Board of Commissioners to designate Big Spring Creek, Section 02, as a Class A wild rainbow trout water from the former Piper Mill Dam (old fish barrier) downstream to the former Strohm Dam at Nealy Road.
4. Pending Commission approval of Class A status for Section 02 of Big Spring Creek, provide a copy of this report to the Pennsylvania Department of Environmental Protection through the Pennsylvania Fish and Boat Commission's Environmental Services Division for a 25 PA Code Chapter 93 upgrade from Cold Water Fishes, Migratory Fishes to High Quality - Cold Water Fishes, Migratory Fishes from the former Piper Mill Dam (old fish barrier) downstream to the former Strohm Dam at Nealy Road (Environmental Services Division action needed).
5. Continue to manage Big Spring Creek, Section 02, as a self-sustaining wild trout water with Catch-and-Release Fly-Fishing Only regulations and no stocking of hatchery trout.
6. Continue to manage Big Spring Creek, sections 03 and 04, as Approved Trout Waters with annual plants of hatchery brook trout and regulated with Commonwealth Inland Waters angling regulations.
7. Fisheries Management should re-inventory Big Spring Creek, sections 01-03 and 05, every five years to track population changes (next survey scheduled for 2013).

8. Request that the Pennsylvania Fish and Boat Commission, Division of Habitat Management, continue to conduct habitat improvement work where feasible at Big Spring Creek. It is preferable to take a watershed approach by beginning enhancement work in the headwaters and progressing in a downstream manner, with the intent of expanding the wild brook and rainbow trout populations (Division of Habitat Management action needed).

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Table 1. Electrofishing station locations, lengths, and average stream widths for sections 01, 02, 03, and 05 of the Big Spring Creek (707B), Cumberland County surveyed during July to October 2002 through 2008.

Station	Downstream limit description	Length (m)	Ave. Width (m)
0101	McCracken Mill Dam (the "Ditch")	150	9.9
0102	300 m downstream from McCracken Mill Dam	300	15.2
0201	300 m downstream from Piper Mill Dam (Old Fish Barrier)	300	11.1
0301	Stone Arch Bridge (SR 3007)	100	9.8
0501	112 m downstream from SR 0641 Bridge in Newville	100	5.5

Table 2. Fish species occurrence at Station 0101 (river-mile 4.96) of Big Spring Creek (707B) Section 01 determined by towed boat electrofishing during July to October 2002 through 2008.

Scientific name	Common name	Year						2008
		2002	2003	2004	2005	2006	2007	
<i>Oncorhynchus mykiss</i>	Rainbow trout - wild	X	X	X	X	X	X	X
<i>Salmo trutta</i>	Brown trout - wild	X	X	X	X	X	X	X
<i>Salvelinus fontinalis</i>	Brook trout - hatchery			X	X		X	
<i>Salvelinus fontinalis</i>	Brook trout - wild	X	X	X	X	X	X	X
<i>Salmo t.</i> X <i>Salvelinus f.</i>	Tiger trout - hatchery	X						
<i>Catostomus commersonii</i>	White sucker	X		X	X			
<i>Cottus spp.</i>	Sculpin Spp.	X		X	X	X		X
<i>Margariscus margarita</i>	Pearl Dace			X				
Total species		6	3	6	5	4	3	4

Table 3. Fish species occurrence at Station 0102 (river-mile 4.77) of Big Spring Creek (707B) Section 01 determined by towed boat electrofishing during July to October 2002 through 2008.

Scientific name	Common name	Year						2008
		2002	2003	2004	2005	2006	2007	
<i>Oncorhynchus mykiss</i>	Rainbow trout	X	X	X	X	X	X	X
<i>Salmo trutta</i>	Brown trout - wild	X	X	X	X	X	X	X
<i>Salvelinus fontinalis</i>	Brook trout - wild	X	X	X	X	X	X	X
<i>Salvelinus fontinalis</i>	Brook trout - hatchery			X	X	X	X	
<i>Catostomus commersonii</i>	White sucker	X			X			
<i>Cottus spp.</i>	Sculpin spp.	X	X	X	X	X		X
<i>Margariscus margarita</i>	Pearl Dace	X			X			X
Total species		6	4	4	6	4	3	5

Table 4. Fish species occurrence at Station 0201 (river-mile 4.29) of Big Spring Creek (707B) Section 02 determined by towed boat electrofishing during July to October 2002 through 2008.

Scientific name	Common name	Year						2008
		2002	2003	2004	2005	2006	2007	
<i>Oncorhynchus mykiss</i>	Rainbow trout - Wild	X	X	X	X	X	X	X
<i>Salmo trutta</i>	Brown trout - wild	X	X	X	X	X	X	X
<i>Salvelinus fontinalis</i>	Brook trout - wild		X	X	X	X	X	X
<i>Salvelinus fontinalis</i>	Brook trout - hatchery			X	X	X	X	
<i>Margariscus margarita</i>	Pearl Dace				X	X		
<i>Catostomus commersonii</i>	White sucker				X			
<i>Cottus spp.</i>	Sculpin spp.		X	X	X	X		X
Total species		2	4	4	6	5	3	4

Table 5. Fish species occurrence at Station 0301 (river-mile 2.53) of Big Spring Creek (707B) Section 03 determined by towed boat electrofishing during July to October 2002 through 2008.

Scientific name	Common name	Year						2008
		2002	2003	2004	2005	2006	2007	
<i>Oncorhynchus mykiss</i>	Rainbow trout - wild					X	X	
<i>Salmo trutta</i>	Brown trout - wild	X				X		
<i>Salmo trutta</i>	Brown trout - hatchery		X					
<i>Salvelinus fontinalis</i>	Brook trout - hatchery					X		
<i>Rhinichthys atratulus</i>	Blacknose dace	X	X	X	X	X	X	X
<i>Catostomus commersonii</i>	White sucker	X	X	X	X	X	X	X
<i>Margariscus margarita</i>	Pearl Dace	X	X	X	X	X	X	X
<i>Anguilla rostrata</i>	American eel		X					
<i>Cyprinella spiloptera</i>	Spotfin shiner				X			
<i>Etheostoma olmstedi</i>	Tessellated darter	X	X		X		X	X
<i>Apeltes quadracus</i>	Fourspine stickleback	X		X	X	X	X	X
<i>Cottus spp.</i>	Sculpin spp.		X	X	X			
<i>Cottus cognatus</i>	Slimy sculpin					X	X	X
Total species		6	7	5	7	8	7	6

Table 6. Fish species occurrence at Station 0501 (river-mile 1.22) of Big Spring Creek (707B) Section 05 determined by towed boat electrofishing during July to October 2002 through 2008.

Scientific name	Common name	Year						2008
		2002	2003	2004	2005	2006	2007	
<i>Oncorhynchus mykiss</i>	Rainbow trout - wild	X		X		X	X	X
<i>Salmo trutta</i>	Brown trout - wild			X	X		X	X
<i>Salvelinus fontinalis</i>	Brook trout - hatchery		X	X		X		X
<i>Rhinichthys atratulus</i>	Blacknose dace	X	X	X	X	X	X	X
<i>Rhinichthys cataractae</i>	Longnose dace	X	X	X	X	X	X	X
<i>Catostomus commersonii</i>	White sucker	X	X	X	X	X	X	X
<i>Ambloplites rupestris</i>	Rock bass	X		X	X			X
<i>Lepomis auritus</i>	Redbreast sunfish							X
<i>Lepomis cyanellus</i>	Green sunfish	X	X	X	X		X	X
<i>Micropterus dolomieu</i>	Smallmouth bass						X	
<i>Notropis hudsonius</i>	Spottail shiner						X	
<i>Luxilus cornutus</i>	Common shiner	X						
<i>Exoglossum maxillingua</i>	Cutlips minnow			X				
<i>Semotilus atromaculatus</i>	Creek chub				X			
<i>Margariscus margarita</i>	Pearl Dace	X	X	X	X	X	X	X
<i>Fundulus diaphanus</i>	Banded killifish	X	X	X	X		X	X
<i>Apeltes quadracus</i>	Fourspine stickleback	X	X	X	X	X	X	X
<i>Etheostoma olmstedi</i>	Tessellated darter	X	X	X	X	X	X	X
<i>Cottus cognatus</i>	Slimy sculpin							X
Total species		11	9	13	11	8	12	14

Table 7. Estimated abundance and biomass of rainbow trout from Big Spring Creek (707B) at station 0201 using a Petersen estimator. Site located at River-Mile 4.29 with a site Lat/Lon of 400820/772424 DMS. Site currently located within Section 02. Survey Date: 08/25/2009.

Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
100	23	9	56	69	0.96	77
125	72	47	115	216	5.66	240
150	59	41	90	177	7.77	197
175	31	17	62	93	6.67	103
200	15	8	32	45	4.70	50
225	1			3	0.43	3
275	1			3	0.75	3
300	13	7	26	39	12.19	43
325	4			12	4.87	13
350	4	2	10	12	5.81	13
375	7	3	18	21	12.91	23
400	2			6	4.80	7
425	4	2	10	12	10.68	13
450	1			3	3.21	3
500	2			6	9.50	7
550	1			3	6.09	3
Totals:	240			720	97.00	798

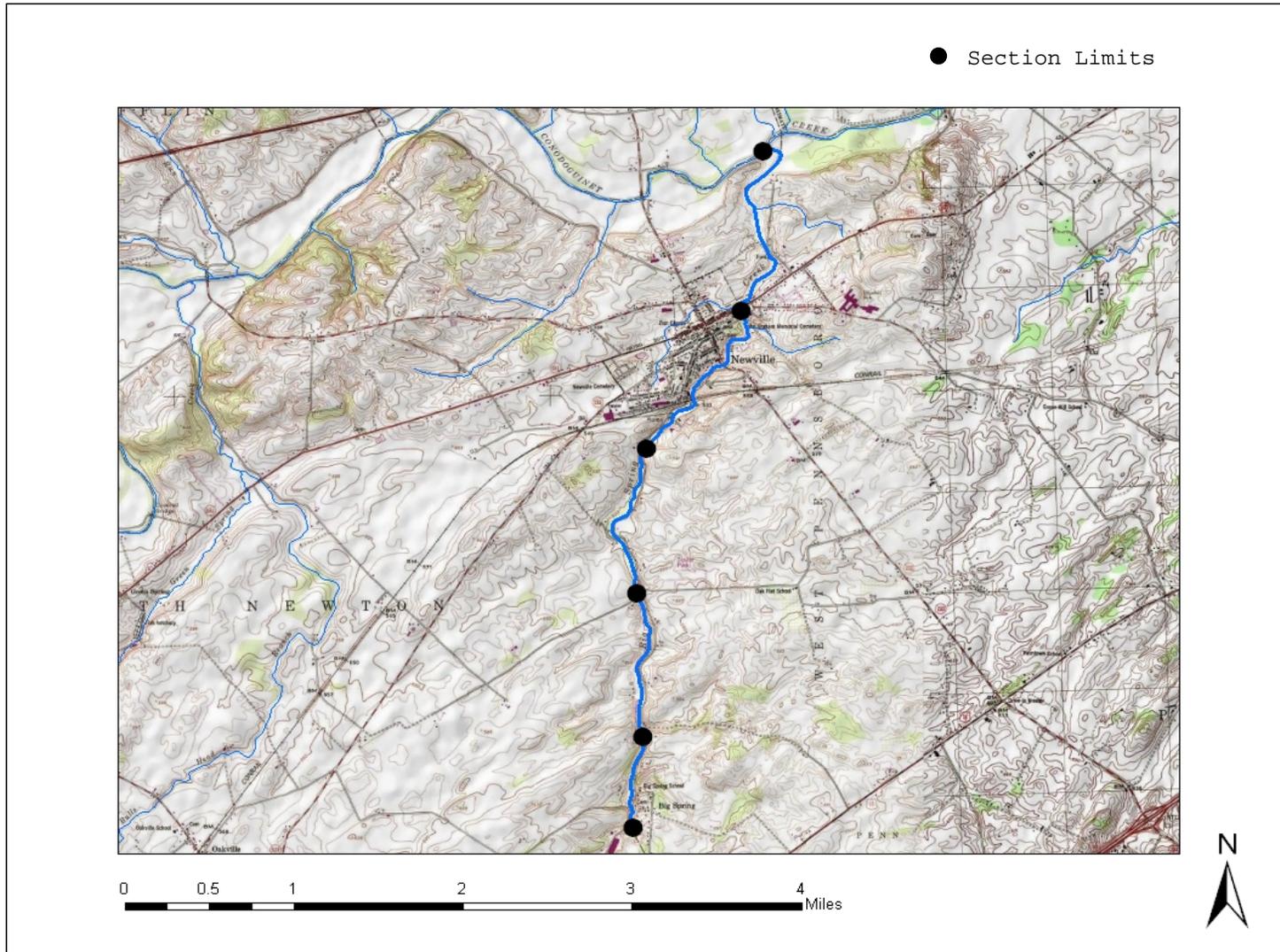


Figure 1. Location map of Big Spring Creek (707B), Cumberland County.

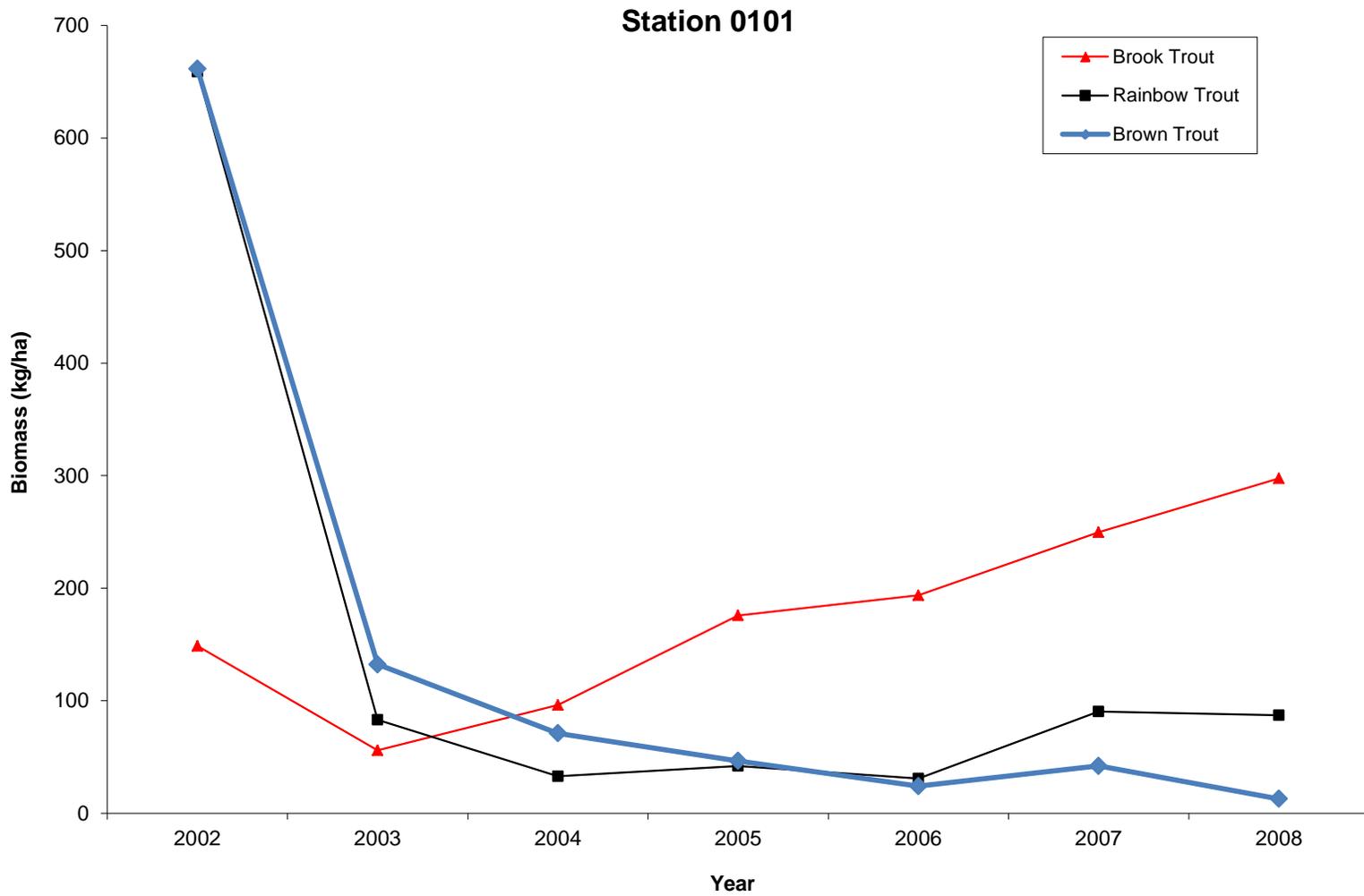


Figure 2. Estimated biomass (kg/ha) trends of wild brook, rainbow, and brown trout from electrofishing surveys conducted from 2002 to 2008 at station 0101 of Big Spring Creek (707B), Cumberland County.

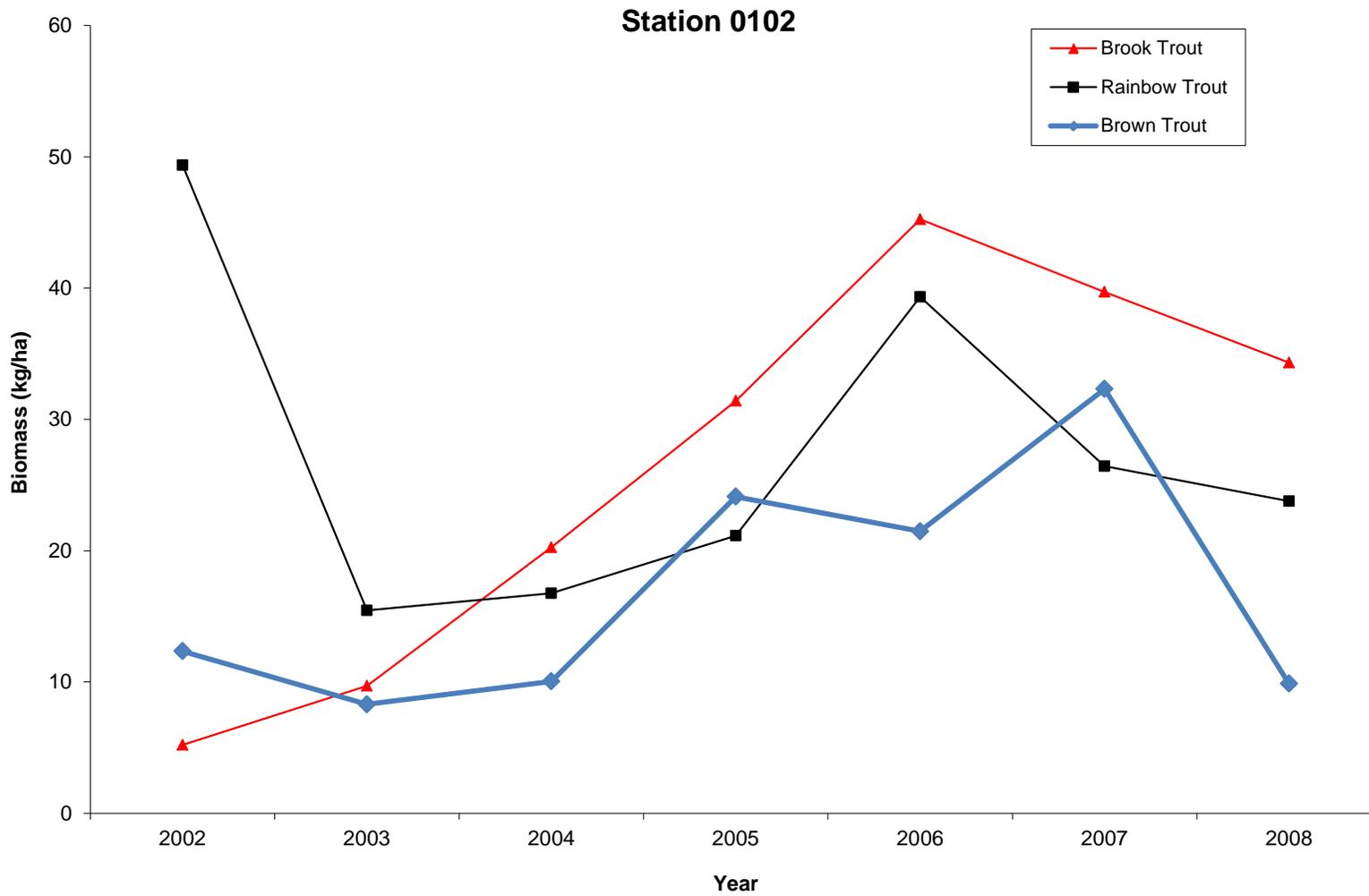


Figure 3. Estimated biomass (kg/ha) trends of wild brook, rainbow, and brown trout from electrofishing surveys conducted from 2002 to 2008 at station 0102 of Big Spring Creek (707B), Cumberland County.

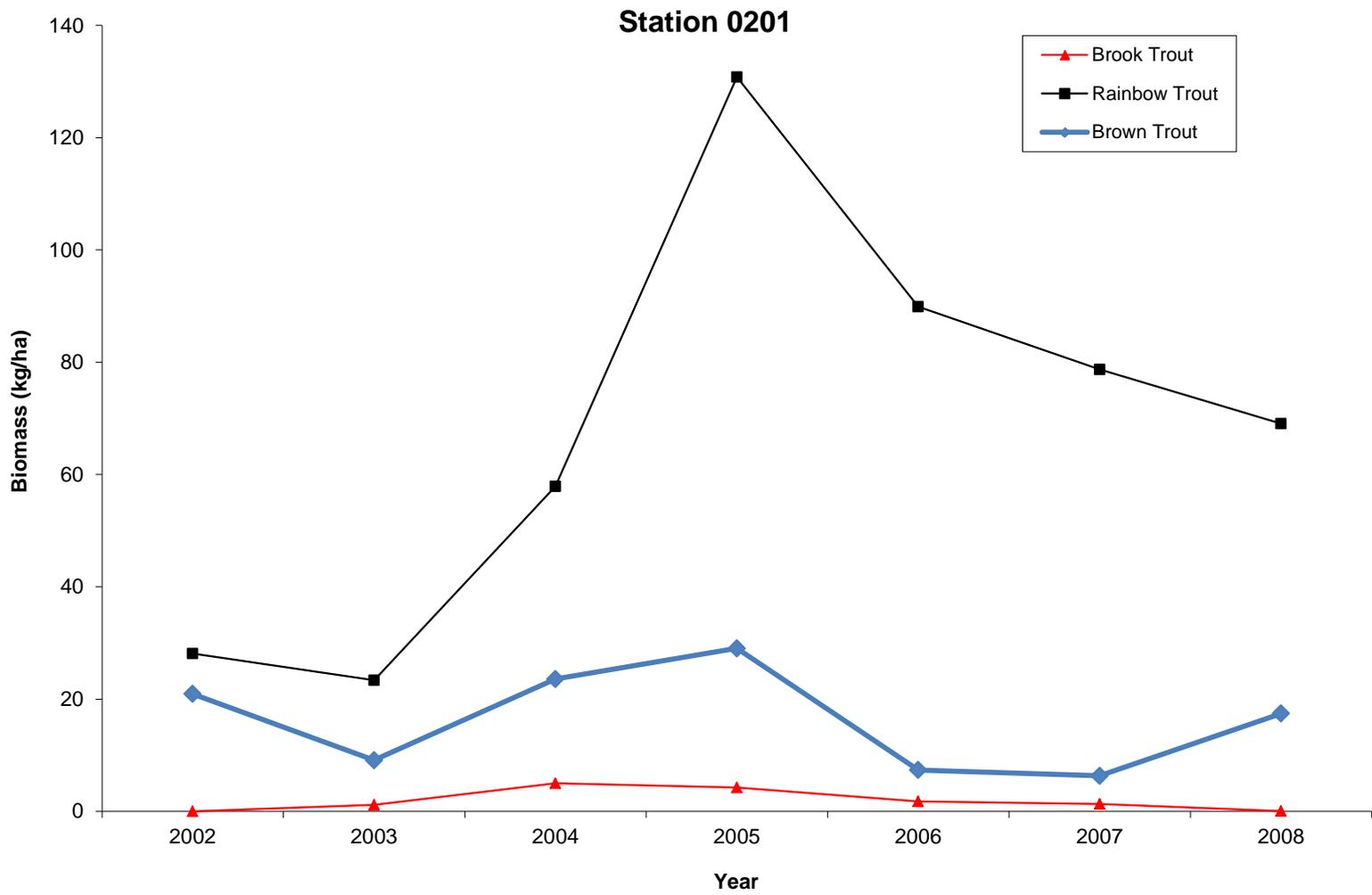


Figure 4. Estimated biomass (kg/ha) trends of wild brook, rainbow, and brown trout from electrofishing surveys conducted from 2002 to 2008 at station 00201 of Big Spring Creek (707B), Cumberland County.

Appendix A. Estimated abundance and biomass of brook rainbow, and brown trout from Big Spring Creek (707B) at station 0101 using a Petersen estimator from 2002 to 2008. Site located at River-Mile 4.96 with a site Lat/Lon of 400747/772427 DMS. Site currently located within Section 01.

Station 0101 - Brook Trout - 9/2/2008						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
75	105	43	263	707	4.21	700
100	54	27	118	364	4.97	360
125	24	11	60	162	3.93	160
150	97	68	143	653	26.81	647
175	128	91	186	862	55.14	853
200	77	53	118	519	47.88	513
225	56	38	85	377	49.37	373
250	38	17	96	256	45.83	253
275	24	11	55	162	36.65	160
300	8	4	17	54	16.63	53
325	1			7	2.66	7
350	1			7	3.37	7
Totals:	613			4130	297.45	4086

Station 0101 - Brook Trout - 8/29/2007						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	6			40	0.1	40
75	216	153	314	1455	8.61	1440
100	113	77	170	761	10.39	753
125	54	36	86	364	8.84	360
150	133	102	179	896	36.72	887
175	89	66	122	599	38.28	593
200	49	33	78	330	30.46	327
225	26	17	41	175	22.94	173
250	32	21	52	215	38.47	213
275	23	14	39	155	35.12	153
300	3			20	6.22	20
325	3			20	8.05	20
375	1			7	5.49	7
Totals:	748			5037	249.69	4986

Appendix A. Continued.

Station 0101 - Brook Trout - 8/30/2006						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	9			61	0.15	60
75	45			303	1.79	300
100	31			209	2.85	207
125	15			101	2.45	100
150	58	33	112	391	16.01	387
175	96	64	150	646	41.3	640
200	55	35	91	370	34.19	367
225	43	27	73	290	37.93	287
250	24	11	60	162	28.85	160
275	9	5	20	61	13.74	60
300	7			47	14.5	47
Totals:	392			2641	193.76	2615

Station 0101 - Brook Trout - 9/6/2005						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	2			13	0.03	13
75	33	13	83	222	1.32	220
100	64	33	135	431	5.89	427
125	69	42	123	465	11.29	460
150	142	101	207	956	39.21	947
175	62	38	106	418	26.67	413
200	18	9	42	121	11.19	120
225	15	8	32	101	13.23	100
250	12	6	26	81	14.43	80
275	12	5	30	81	18.32	80
300	9	4	21	61	18.65	60
325	2			13	5.36	13
350	1			7	3.37	7
400	1			7	6.9	7
Totals:	442			2977	175.86	2947

Appendix A. Continued.

Station 0101 - Brook Trout - 9/10/2004						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	11			74	0.18	73
75	167	83	366	1125	6.66	1113
100	28			189	2.58	187
125	2			13	0.33	13
150	14			94	3.87	93
175	15			101	6.45	100
200	40	16	100	269	24.86	267
225	20	10	45	135	17.64	133
250	10	5	21	67	12.02	67
275	7	3	18	47	10.69	47
300	4			27	8.29	27
325	1			7	2.68	7
Totals:	319			2148	96.25	2127

Station 0101 - Brook Trout - 8/28/2003						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	2			13	0.03	13
75	42	22	85	283	1.67	280
100	50	29	89	337	4.6	333
125	41	22	84	276	6.71	273
150	3			20	0.83	20
175	7	3	16	47	3.01	47
200	16	8	34	108	9.94	107
225	8			54	7.06	53
250	7	3	18	47	8.42	47
275	4			27	6.11	27
300	2			13	4.14	13
350	1			7	3.37	7
Totals:	183			1232	55.89	1220

Appendix A. Continued.

Station 0101 - Brook Trout - 7/30/2002						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	3			20	0.08	20
75	8			54	0.65	53
100	5			34	0.84	33
125	25	13	50	168	5.89	167
150	32	20	54	215	11.42	213
175	17	9	38	114	8.7	113
200	9	5	20	61	6.85	60
225	16	10	28	108	16.05	107
250	17	9	38	114	18.77	113
275	22	14	38	148	34.22	147
300	14	7	31	94	30.73	93
325	2			13	3.77	13
350	2			13	5.12	13
375	1			7	5.49	7
Totals:	173			1163	148.58	1152

Station 0101 - Rainbow Trout - 9/2/2008						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	1			7	0.02	7
125	1			7	0.18	7
150	1			7	0.30	7
175	1			7	0.48	7
225	2			13	1.93	13
250	9			61	11.34	60
275	11	5	28	74	18.49	73
300	6			40	12.62	40
325	6			40	16.39	40
350	3			20	9.76	20
375	2			13	8.32	13
450	1			7	7.19	7
Totals:	44			296	87.02	294

Appendix A. Continued.

Station 0101 - Rainbow Trout - 8/29/2007						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
125	4			27	0.71	27
150	4			27	1.18	27
200	3			20	2.11	20
225	8	4	20	54	7.72	53
250	30	15	63	202	37.89	200
275	6			40	10.15	40
300	2			13	4.25	13
325	5			34	13.71	33
350	1			7	3.25	7
375	1			7	4.19	7
400	1			7	5.38	7
Totals:	65			438	90.54	434

Station 0101 - Rainbow Trout - 8/30/2006						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
100	1			7	0.09	7
125	4			27	0.71	27
150	13			88	3.84	87
175	5			34	2.41	33
225	1			7	0.96	7
275	4			27	6.77	27
300	1			7	2.13	7
350	3			20	9.76	20
375	1			7	4.19	7
Totals:	33			224	30.86	222

Appendix A. Continued.

Station 0101 - Rainbow trout - 9/6/2005						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
100	1			7	0.09	7
125	1			7	0.18	7
150	4			27	1.18	27
175	2			13	0.96	13
200	3			20	2.11	20
225	3			20	2.89	20
250	6	2	15	40	7.58	40
275	5			34	8.46	33
300	4			27	8.5	27
325	1			7	2.74	7
350	1			7	3.25	7
375	1			7	4.19	7
Totals:	32			216	42.13	215

Station 0101 - Rainbow Trout - 9/10/2004						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
125	10			67	1.76	67
150	6			40	1.77	40
175	6			40	2.89	40
200	6	3	15	40	4.22	40
225	11	4	26	74	10.61	73
250	5			34	6.31	33
300	1			7	2.13	7
350	1			7	3.25	7
Totals:	46			309	32.94	307

Appendix A. Continued.

Station 0101 - Rainbow Trout - 8/28/2003						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
75	3			20	0.13	20
100	15			101	1.4	100
125	10			67	1.76	67
150	9			61	2.66	60
175	1			7	0.48	7
200	3			20	2.11	20
225	6			40	5.79	40
250	3			20	3.79	20
275	3			20	5.08	20
300	2			13	4.25	13
325	2			13	5.48	13
350	3			20	9.76	20
375	2			13	8.37	13
400	4			27	21.52	27
525	1			7	10.45	7
Totals:	67			449	83.03	447

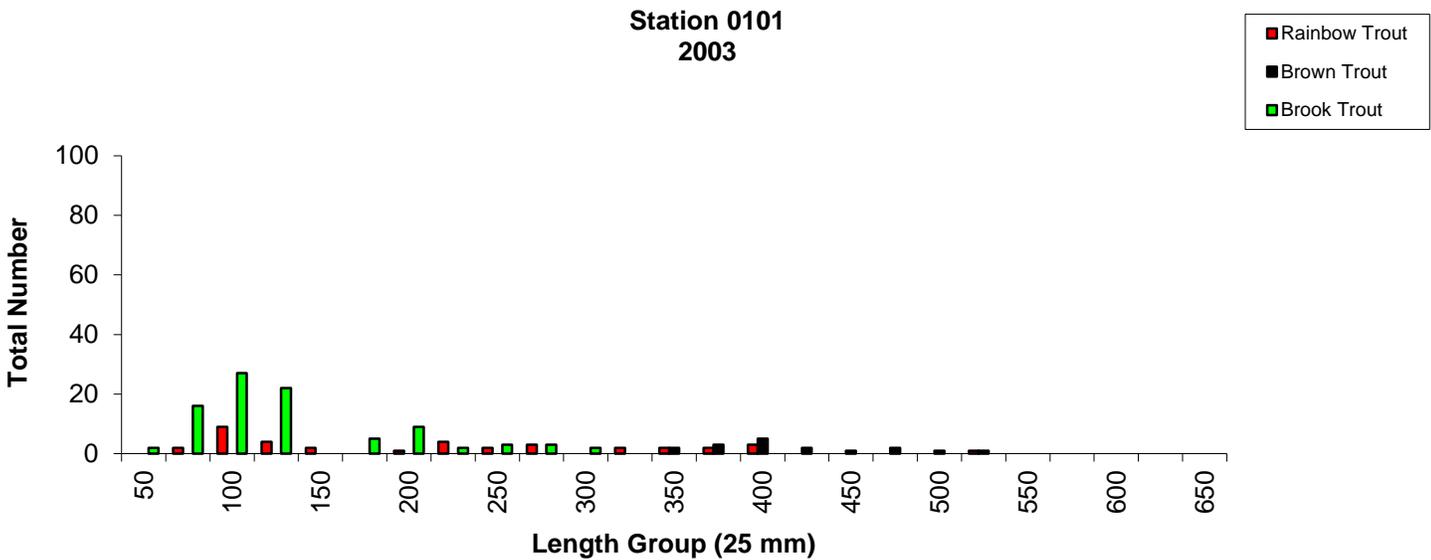
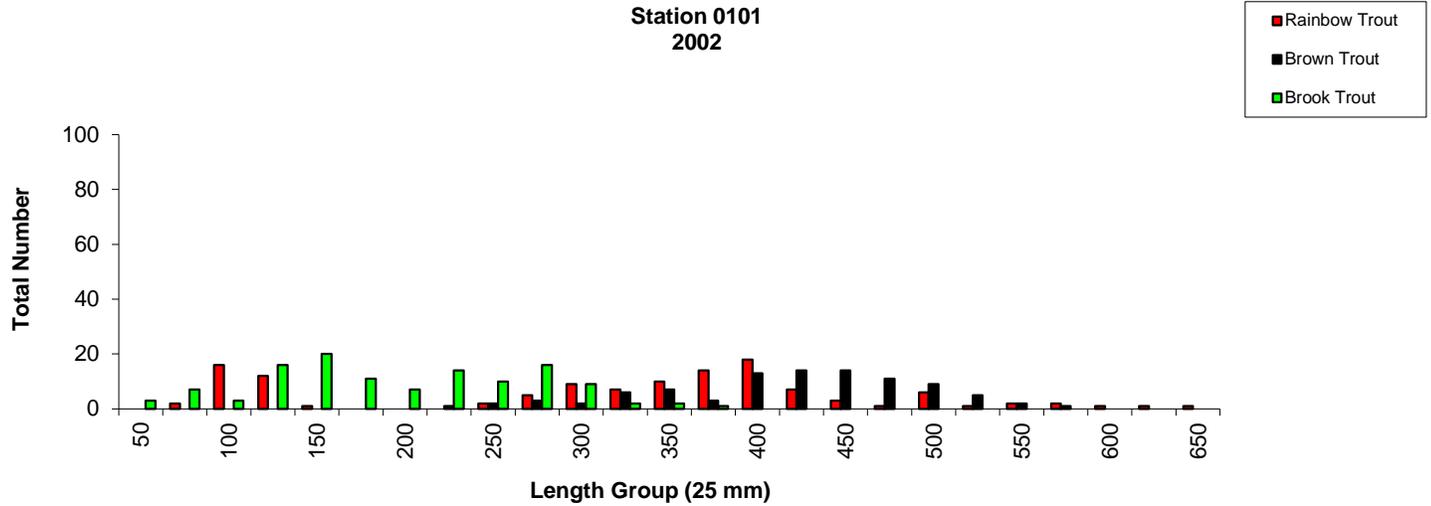
Appendix A. Continued.

Station 0101 - Rainbow Trout - 7/30/2002						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
75	2			13	0.11	13
100	26	14	54	175	3.5	173
125	19	10	38	128	5.12	127
150	1			7	0.31	7
200	1			7	0.7	7
225	1			7	1.75	7
250	3			20	4.85	20
275	6	3	14	40	9.9	40
300	10	5	22	67	18.52	67
325	10	4	24	67	25.59	67
350	15	8	30	101	52.73	100
375	23	11	52	155	89.52	153
400	20	13	34	135	92.66	133
425	11	6	23	74	56.15	73
450	9	4	23	61	57.88	60
475	1			7	7.41	7
500	7	3	16	47	63.16	47
525	3			20	32.93	20
550	5			34	57.24	33
575	2			13	24.24	13
600	1			7	12.79	7
625	1			7	19.86	7
650	1			7	22.05	7
Totals:	178			1199	658.97	1188

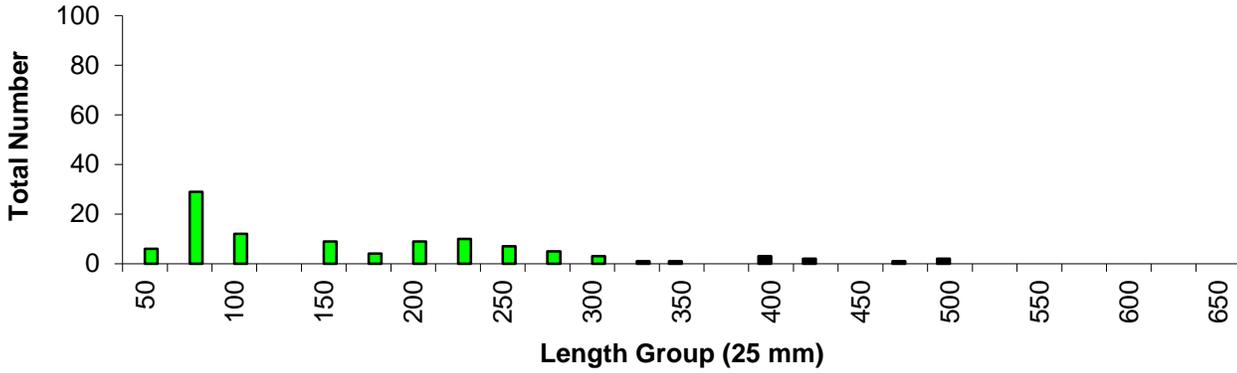
Appendix A. Continued.

Station 0101 - Brown Trout - 7/30/2002						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	1			7	0.01	7
225	1			7	1.21	7
250	2			13	2.69	13
275	5	2	13	34	9.33	33
300	2			13	4.1	13
325	8	4	19	54	19.02	53
350	11	5	28	74	36.89	73
375	5	2	13	34	19.43	33
400	15	9	27	101	60.71	100
425	16	10	28	108	82.32	107
450	20	12	38	135	114.88	133
475	12	7	23	81	74.26	80
500	12	7	24	81	92.44	80
525	8	4	18	54	77.58	53
550	5			34	53.87	33
575	1			7	12.79	7
Totals:	124			837	661.53	825

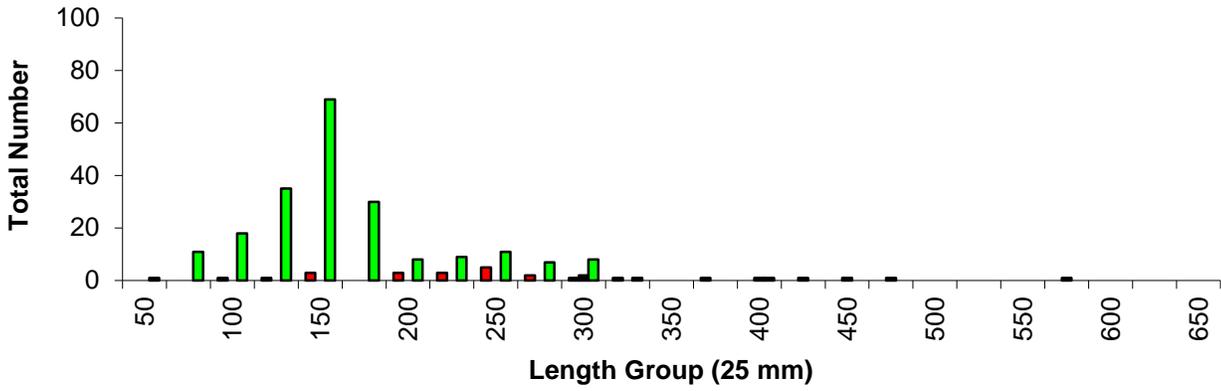
Appendix B. Total number of wild rainbow, brown, and brook trout collected during the first electrofishing pass at station 0101 of Big Spring Creek (707B) during surveys conducted from 2002 to 2008. Site located at River-Mile 4.96 with a site Lat/Lon of 400747/772428 DMS. Site currently located within Section 01.



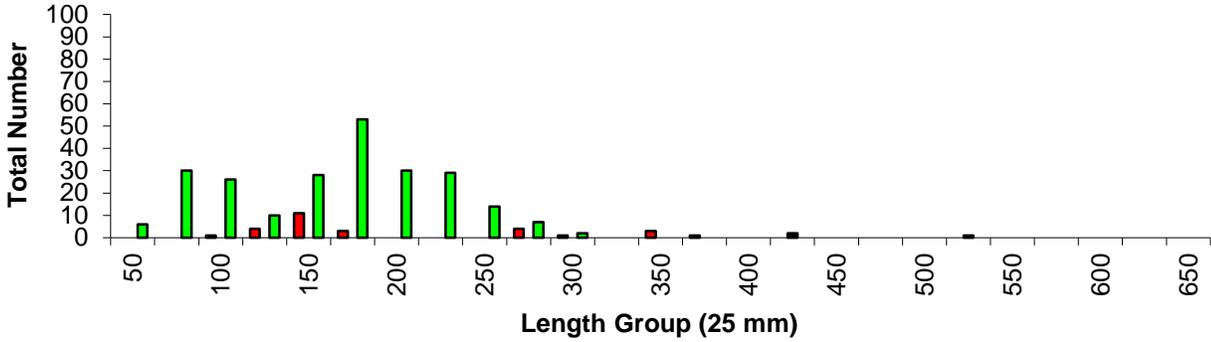
**Station 0101
2004**



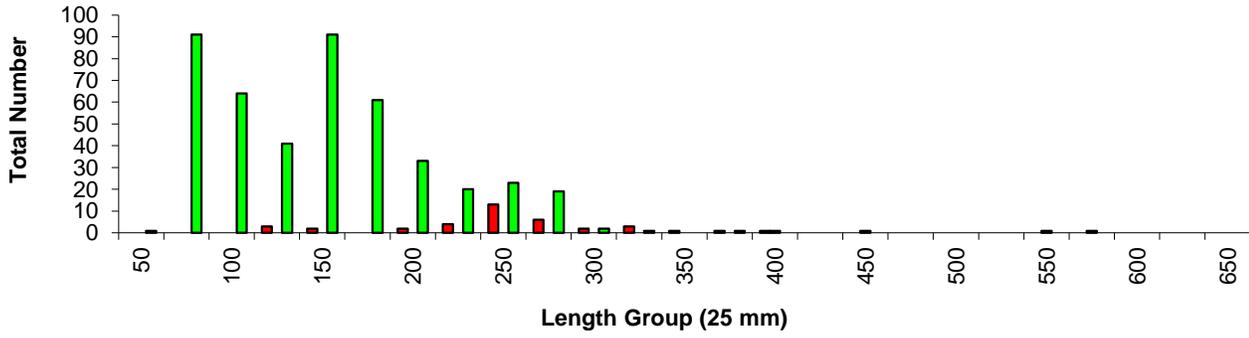
**Station 0101
2005**



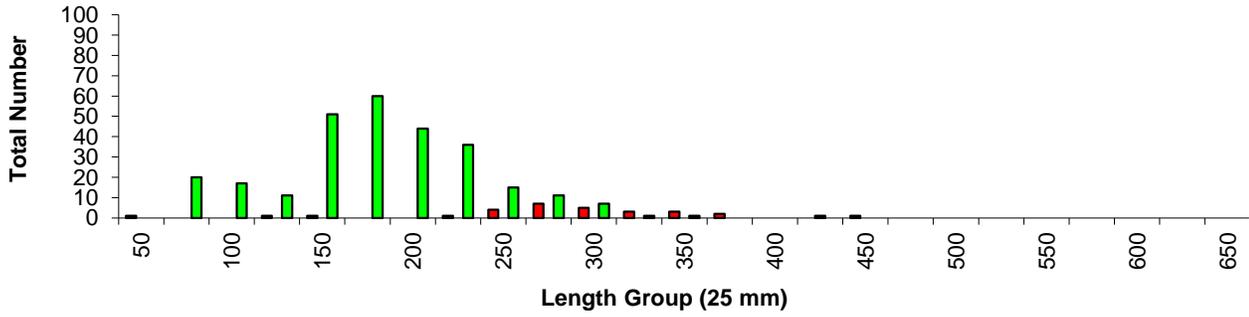
**Station 0101
2006**



Station 0101
2007



Station 0101
2008



Appendix C. Estimated abundance and biomass of brook and rainbow trout from Big Spring Creek (707B) at station 0102 using a Petersen estimator from 2002 to 2008. Site located at River-Mile 4.77 with a site Lat/Lon of 400756/772427 DMS. Site currently located within Section 01.

Station 0102 - Brook Trout - 9/3/2008						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	7			15	0.04	23
75	121	49	303	265	1.58	403
100	20	8	49	44	0.60	67
125	4			9	0.21	13
150	12	5	31	26	1.08	40
175	17	8	38	37	2.38	57
200	17	8	38	37	3.44	57
225	3			7	0.86	10
250	7			15	2.75	23
275	5	2	13	11	2.49	17
300	7	3	16	15	4.74	23
325	3			7	2.60	10
350	4			9	4.39	13
375	4			9	7.15	13
Totals:	231			506	34.31	769

Station 0102 - Brook Trout - 8/29/2007						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	15			33	0.08	50
75	241	143	435	529	3.13	803
100	13			29	0.39	43
125	24	11	60	53	1.28	80
150	44	25	82	96	3.96	147
175	21	12	39	46	2.94	70
200	13	6	26	29	2.63	43
225	13	6	30	29	3.73	43
250	8	4	18	18	3.13	27
275	5	2	13	11	2.49	17
300	11	6	24	24	7.42	37
325	6	3	16	13	5.24	20
350	3			7	3.29	10
Totals:	417			917	39.71	1390

Appendix C. Continued.

Station 0102 - Brook Trout - 8/30/2006						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	3			7	0.02	10
75	59			129	0.77	197
100	102	48	235	224	3.06	340
125	34	18	71	75	1.81	113
150	14	7	31	31	1.26	47
175	13	7	26	29	1.82	43
200	16	6	39	35	3.24	53
225	5	2	13	11	1.44	17
250	16	9	33	35	6.26	53
275	12	6	25	26	5.97	40
300	10	4	24	22	6.75	33
325	3			7	2.62	10
350	4	2	10	9	4.39	13
375	2			4	3.58	7
400	1			2	2.25	3
Totals:	294			646	45.24	979

Station 0102 - Brook Trout - 9/7/2005						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	3			7	0.02	10
75	33			72	0.43	110
100	147	60	368	322	4.4	490
125	18	8	46	39	0.96	60
150	54	25	124	118	4.86	180
175	20			44	2.8	67
200	13	6	33	29	2.63	43
225	9	4	21	20	2.59	30
250	7			15	2.74	23
275	3			7	1.49	10
325	1			2	0.87	3
375	3			7	5.37	10
400	1			2	2.25	3
Totals:	312			684	31.41	1039

Appendix C. Continued.

Station 0102 - Brook Trout - 9/8/2004						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	5			12	0.03	17
75	64	33	135	150	0.89	213
100	9			21	0.29	30
150	6			14	0.58	20
175	1			2	0.15	3
200	1			2	0.22	3
225	6	3	16	14	1.85	20
250	8	4	18	19	3.35	27
275	2			5	1.06	7
300	6			14	4.33	20
325	3			7	2.8	10
350	4			9	4.7	13
Totals:	115			269	20.25	383

Station 0102 - Brook Trout - 8/28/2003						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	1			2	0.01	3
75	51	21	128	120	0.71	170
100	34	17	74	80	1.09	113
125	7			16	0.4	23
150	1			2	0.1	3
175	7	3	18	16	1.05	23
200	7	3	16	16	1.52	23
225	5			12	1.54	17
250	5	2	13	12	2.1	17
350	1			2	1.18	3
Totals:	119			278	9.7	395

Appendix C. Continued.

Station 0102 - Brook Trout - 7/30/2002						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	24			56	0.23	80
75	62	36	116	146	0.87	207
100	4			9	0.1	13
200	6	3	16	14	1.23	20
225	2			5	0.68	7
250	2			5	0.79	7
275	1			2	0.54	3
300	1			2	0.77	3
Totals:	102			239	5.21	340

Station 0102 - Rainbow Trout - 9/3/2008						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
100	1			2	0.03	3
125	7			15	0.40	23
150	7			15	0.67	23
175	10			22	1.57	33
200	4			9	0.92	13
225	1			2	0.31	3
250	6			13	2.46	20
275	4			9	2.19	13
300	6			13	4.11	20
325	1			2	0.89	3
350	2			4	2.12	7
400	2			4	3.50	7
575	1			2	4.61	3
Totals:	52			112	23.78	171

Appendix C. Continued.

Station 0102 - Rainbow Trout - 8/29/2007						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
100	7	3	18	15	0.21	23
125	32	18	59	70	1.84	107
150	13	6	28	29	1.25	43
175	2			4	0.31	7
200	2			4	0.46	7
225	10	4	25	22	3.14	33
250	13	6	30	29	5.35	43
275	6			13	3.31	20
300	2			4	1.38	7
325	3			7	2.68	10
350	1			2	1.06	3
375	4	2	10	9	5.45	13
Totals:	95			208	26.44	316

Station 0102 - Rainbow Trout - 8/30/2006						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
100	4			9	0.12	13
125	83	53	137	182	4.77	277
150	66	44	101	145	6.35	220
175	17	8	37	37	2.67	57
200	6	2	15	13	1.37	20
225	4			9	1.26	13
250	6			13	2.47	20
275	10	4	25	22	5.51	33
300	11	5	27	24	7.61	37
325	3			7	2.68	10
350	1			2	1.06	3
500	1			2	3.47	3
Totals:	212			465	39.34	706

Appendix C. Continued.

Station 0102 - Rainbow Trout - 9/7/2005						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
125	18			39	1.03	60
150	36	19	73	79	3.46	120
175	21	11	43	46	3.3	70
200	9			20	2.06	30
225	5	2	13	11	1.57	17
250	3			7	1.23	10
275	5	2	13	11	2.75	17
300	1			2	0.69	3
325	1			2	0.89	3
350	1			2	1.06	3
375	1			2	1.36	3
400	1			2	1.75	3
Totals:	102			223	21.15	339

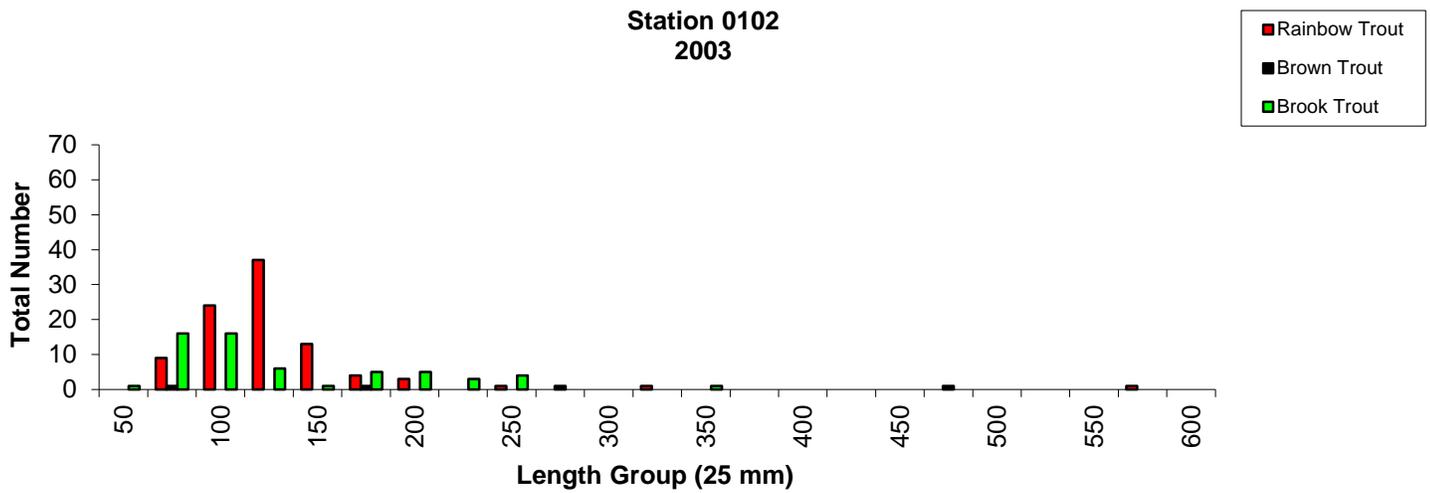
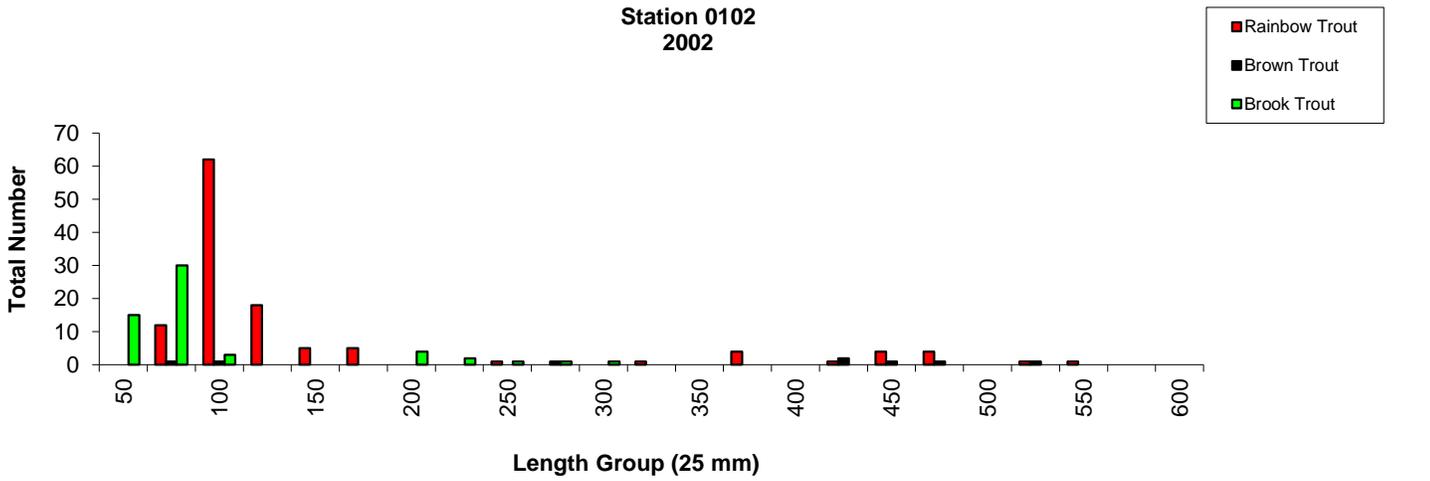
Station 0102 - Rainbow Trout - 9/8/2004						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
100	7	3	18	16	0.23	23
125	11			26	0.68	37
150	14			33	1.44	47
175	12			28	2.02	40
200	9			21	2.21	30
225	7	3	18	16	2.35	23
250	6			14	2.64	20
275	4			9	2.36	13
300	1			2	0.74	3
425	1			2	2.09	3
Totals:	72			167	16.76	239

Appendix C. Continued.

Station 0102 - Rainbow Trout - 8/28/2003						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
75	25	10	63	59	0.37	83
100	45	27	79	106	1.47	150
125	52	35	79	122	3.2	173
150	21	10	48	49	2.16	70
175	5	2	13	12	0.84	17
200	3			7	0.74	10
225	1			2	0.34	3
250	1			2	0.44	3
325	1			2	0.96	3
575	1			2	4.93	3
Totals:	155			363	15.45	515

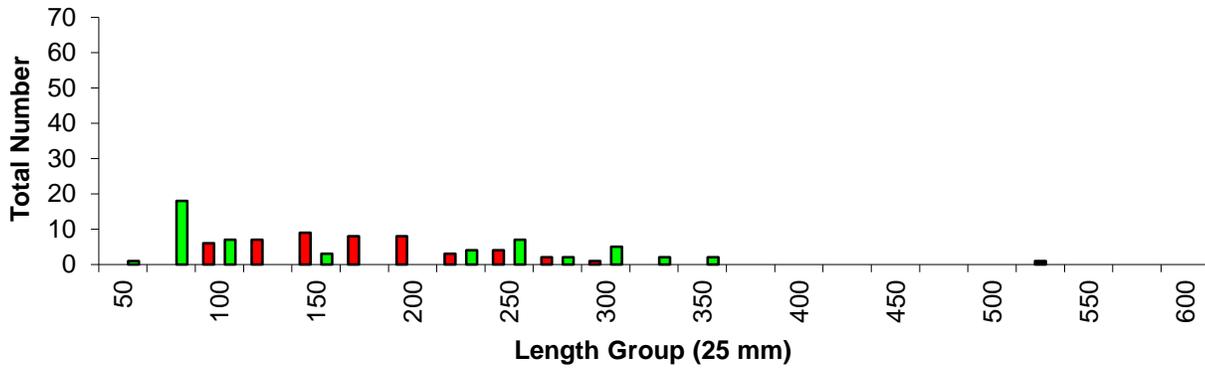
Station 0102 - Rainbow Trout - 7/30/2002						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
75	13	6	30	31	0.24	43
100	102	72	149	239	4.07	340
125	22	14	37	52	1.5	73
150	7	3	16	16	0.69	23
175	7	3	16	16	1.17	23
250	1			2	0.56	3
325	1			2	1.18	3
375	4			9	5.62	13
425	1			2	1.78	3
450	5	2	13	12	10.32	17
475	6	3	16	14	14.55	20
525	1			2	3.83	3
550	1			2	3.85	3
Totals:	171			399	49.36	567

Appendix D. Total number of wild rainbow, brown, and brook trout collected during the first electrofishing pass at station 0102 of Big Spring Creek (707B) during surveys conducted from 2002 to 2008. Site located at River-Mile 4.77 with a site Lat/Lon of 400756/772427 DMS. Site currently located within Section 01.

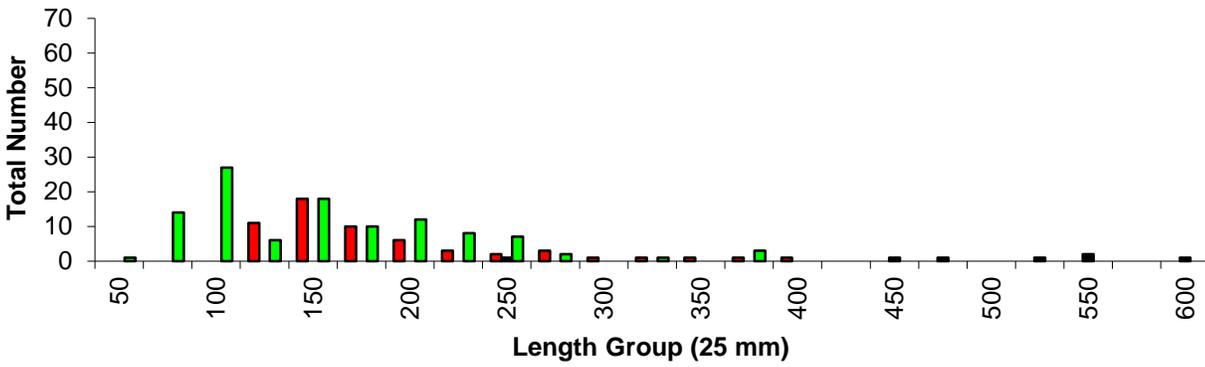


Appendix D. Continued.

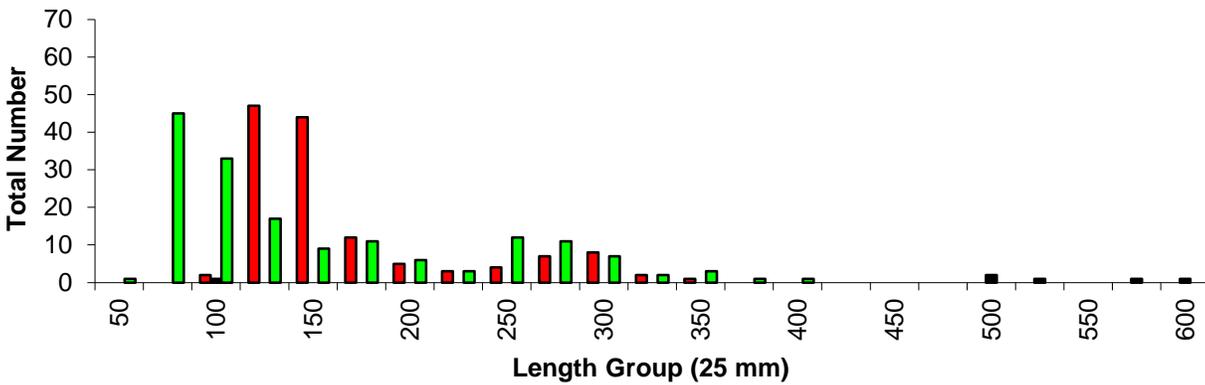
Station 0102
2004



Station 0102
2005

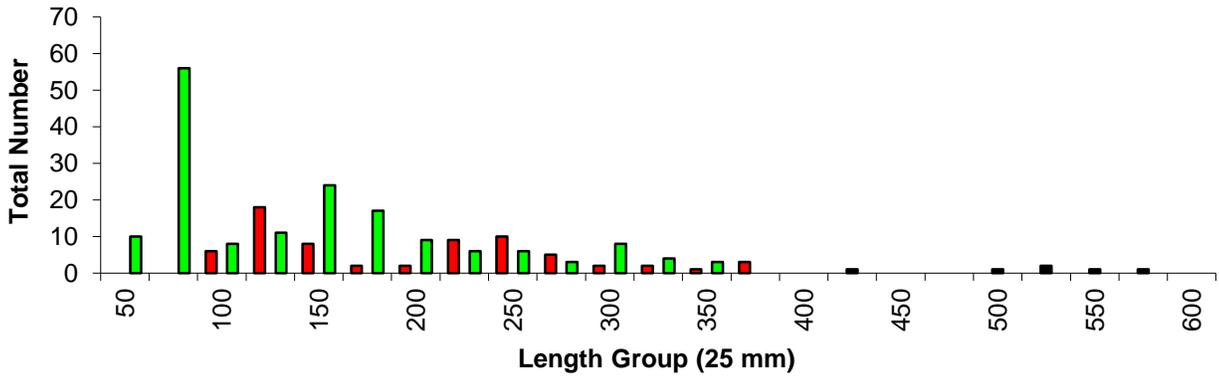


Station 0102
2006

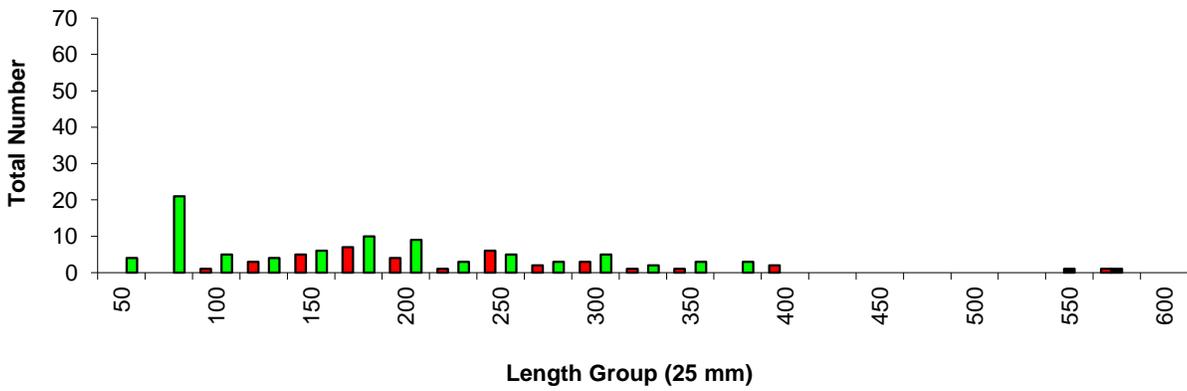


Appendix D. Continued.

Station 0102
2007



Station 0102
2008



Appendix E. Estimated abundance and biomass of rainbow trout from Big Spring Creek (707B) at station 0201 using a Petersen estimator from 2002 to 2008. Site located at River-Mile 4.29 with a site Lat/Lon of 400820/772424 DMS. Site currently located within Section 02.

Station 0201 - Rainbow Trout - 9/3/2008

Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
125	22	11	49	66	1.73	73
150	73	44	128	219	9.62	243
175	60	36	106	180	12.91	200
200	26	12	59	78	8.15	87
225	10	4	25	30	4.30	33
250	6	2	15	18	3.37	20
275	2			6	1.50	7
300	4			12	3.75	13
350	5			15	7.26	17
375	1			3	1.86	3
550	1			3	6.09	3
625	1			3	8.51	3
Totals:	211			633	69.05	702

Station 0201 - Rainbow Trout - 8/29/2007

Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
100	5			15	0.21	17
125	67	43	111	201	5.27	223
150	82	59	116	246	10.81	273
175	37	24	62	111	7.96	123
200	7	3	18	21	2.2	23
250	8	4	21	24	4.51	27
275	17	9	35	51	12.83	57
300	5			15	4.74	17
325	2			6	2.44	7
350	7	3	18	21	10.16	23
375	1			3	1.87	3
400	2			6	4.8	7
475	2			6	6.16	7
500	1			3	4.75	3
Totals:	243			729	78.71	810

Appendix E. Continued.

Station 0201 - Rainbow Trout - 8/30/2006						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
100	12	5	31	36	0.5	40
125	120	81	186	360	9.44	400
150	107	70	171	321	14.1	357
175	48	29	86	144	10.33	160
200	9	4	20	27	2.82	30
225	11	5	25	33	4.73	37
250	8	4	18	24	4.51	27
275	9	5	20	27	6.79	30
300	6			18	5.69	20
325	5	2	13	15	6.11	17
350	6	3	14	18	8.71	20
425	2			6	5.34	7
500	1			3	4.75	3
550	1			3	6.09	3
Totals:	345			1035	89.91	1151

Station 0201 - Rainbow Trout - 9/6/2005						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
100	1			3	0.04	3
125	55	34	94	165	4.33	183
150	114	80	169	342	15.02	380
175	54	33	94	162	11.62	180
200	35	20	67	105	10.98	117
225	22	10	55	66	9.46	73
250	1			3	0.56	3
275	7	3	18	21	5.28	23
300	8	4	18	24	7.58	27
325	7	3	18	21	8.56	23
350	8	4	20	24	11.61	27
375	5	2	13	15	9.34	17
400	2			6	4.8	7
425	1			3	2.67	3
450	3			9	9.62	10
500	1			3	4.75	3
550	1			3	6.09	3
625	1			3	8.51	3
Totals:	326			978	130.82	1085

Appendix E. Continued.

Station 0201 - Rainbow Trout - 9/8/2004						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
125	25	12	58	72	1.9	83
150	49	31	82	142	6.23	163
175	43	21	94	125	8.93	143
200	23	11	52	67	6.96	77
225	10	4	25	29	4.15	33
250	3			9	1.63	10
275	5	2	13	14	3.64	17
300	4	2	10	12	3.66	13
325	4	2	10	12	4.72	13
350	2			6	2.8	7
400	2			6	4.63	7
425	1			3	2.58	3
575	1			3	6.09	3
Totals:	172			500	57.92	572

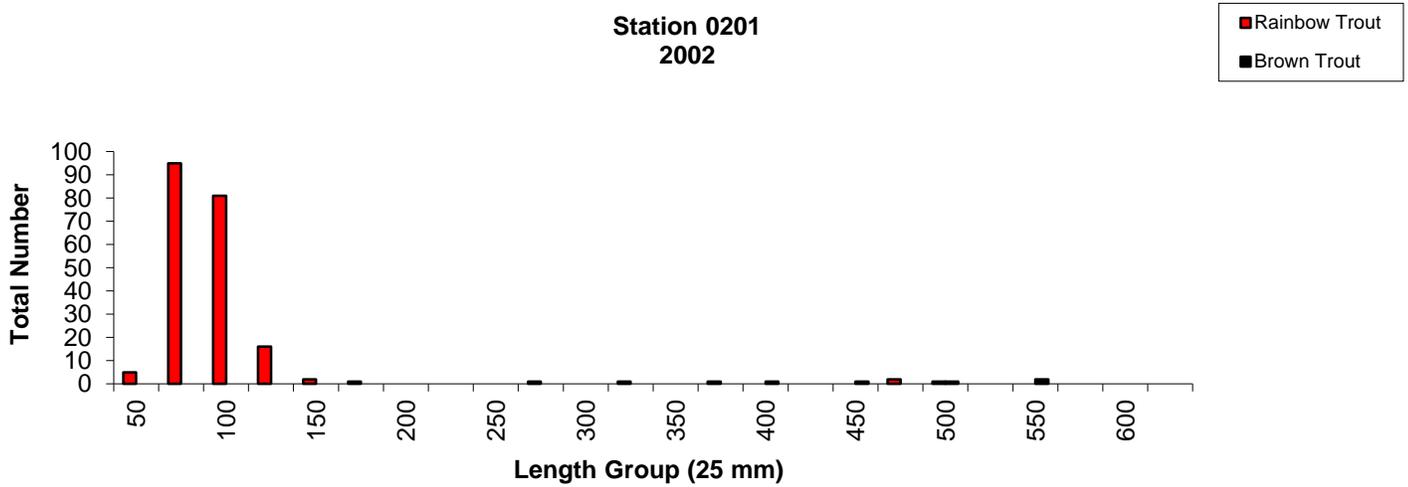
Station 0201 - Rainbow Trout - 8/28/2003						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
100	4			12	0.16	13
125	7	3	18	20	0.53	23
150	20	9	50	58	2.54	67
175	20	10	44	58	4.15	67
200	9	5	19	26	2.72	30
225	1			3	0.42	3
250	3			9	1.63	10
275	2			6	1.46	7
325	1			3	1.18	3
475	1			3	3.99	3
500	1			3	4.58	3
Totals:	69			201	23.36	229

Appendix E. Continued.

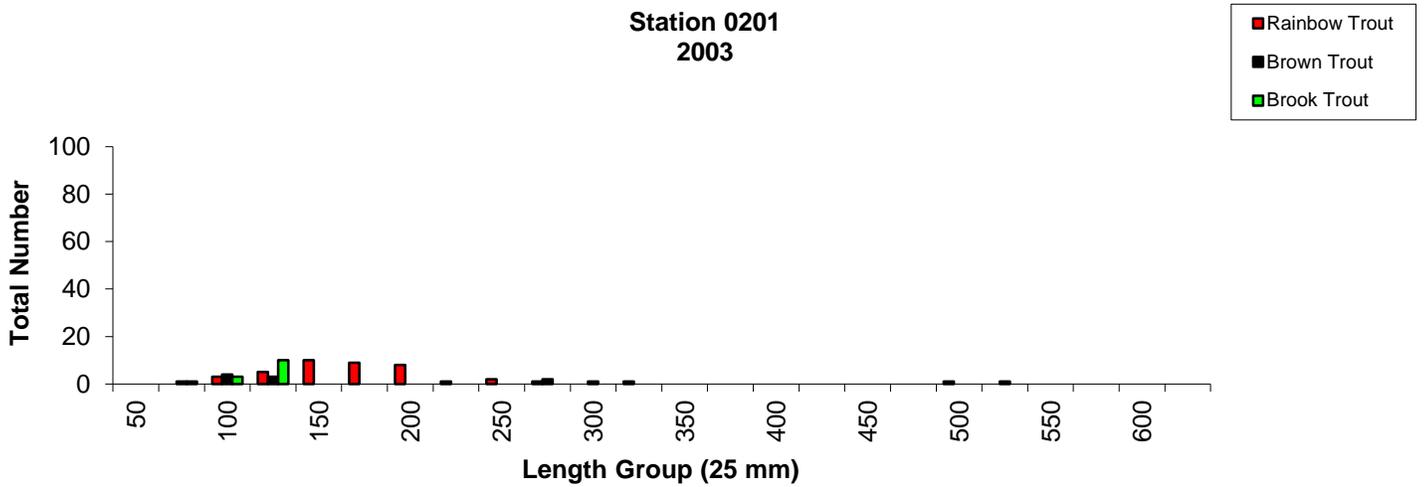
Station 0201 - Rainbow Trout - 7/30/2002						
Size Group (mm)	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	5			14	0.04	17
75	231	160	347	670	5.36	770
100	127	93	179	368	4.79	423
125	18	11	30	52	1.41	60
150	4			12	0.53	13
175	2			6	1.04	7
275	1			3	0.71	3
325	1			3	1.56	3
375	1			3	2.03	3
475	2			6	6.41	7
500	1			3	4.26	3
Totals:	393			1140	28.14	1309

Appendix F. Total number of wild rainbow, brown, and brook trout collected during the first electrofishing pass at station 0201 of Big Spring Creek (707B) during surveys conducted from 2002 to 2008. Site located at River-Mile 4.29 with a site Lat/Lon of 400820/772424 DMS. Site currently located within Section 01.

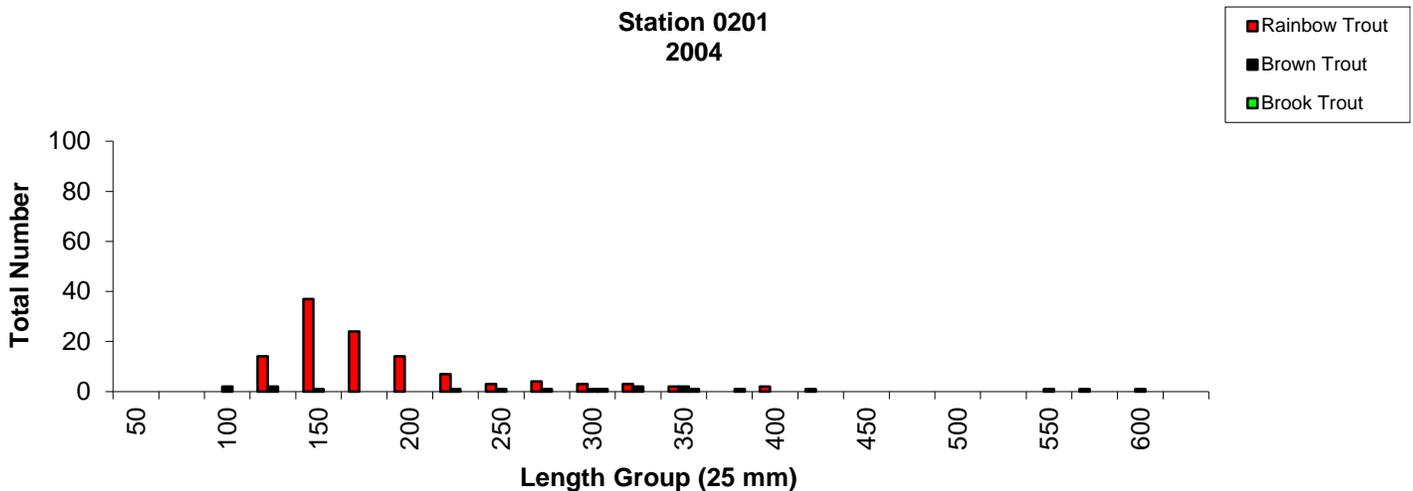
**Station 0201
2002**



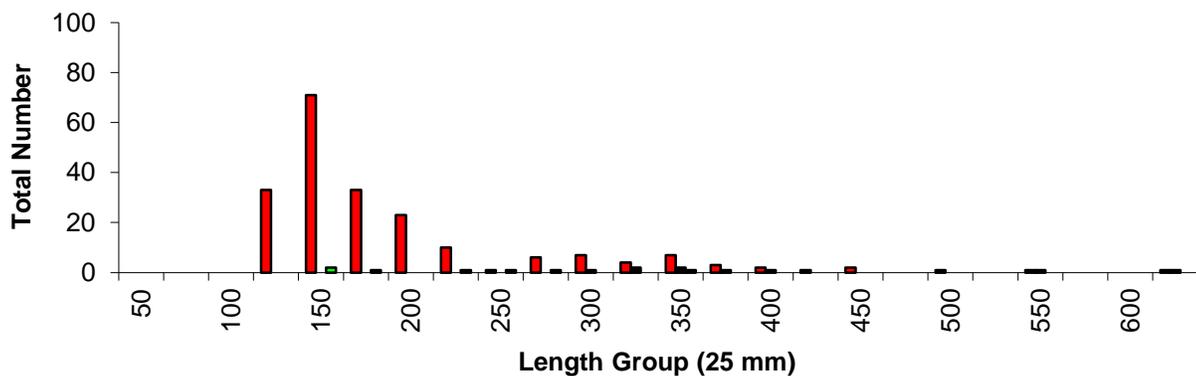
**Station 0201
2003**



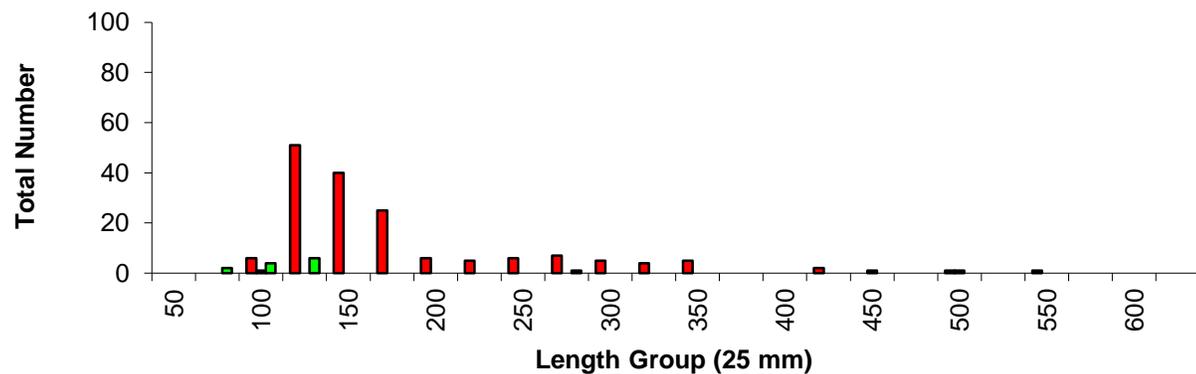
**Station 0201
2004**



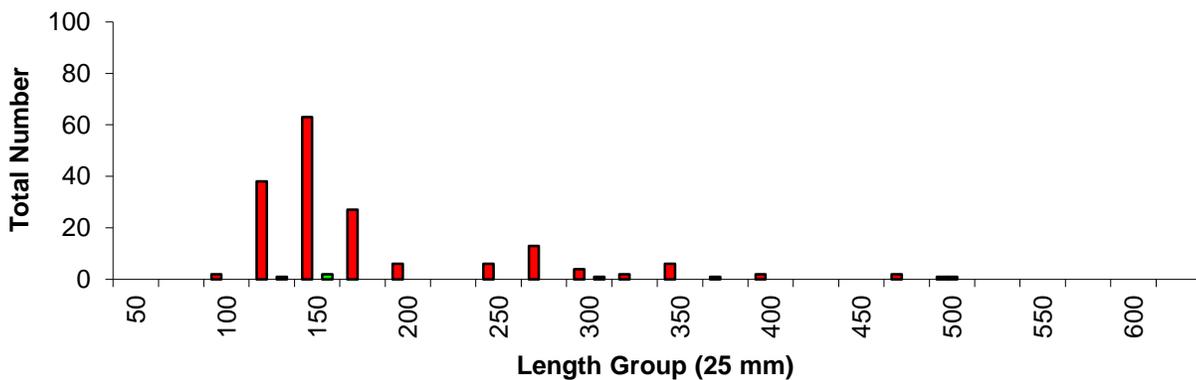
Station 0201
2005



Station 0201
2006



Station 0201
2007



Appendix F. Continued.

Station 0201
2008

