

COMMENTS AND RECOMMENDATIONS

February 16, 2012

WATER: Coles Creek Basin (405C) Sullivan/Columbia/Luzerne Counties

EXAMINED: July and August 2009

BY: Wnuk, Frey, and Precone

Bureau Director Action: _____ Date: _____

Division Chief Action: _____ Date: _____

WW Unit Leader Action: _____ Date: _____

CW Unit Leader Action: _____ Date: _____

=====
AREA COMMENTS:

The Coles Creek Basin consists of six named streams in Sullivan, Columbia, and Luzerne Counties. Historically, the Pennsylvania Fish and Boat Commission did not conduct much work in this basin because its streams are almost completely closed to public angling. In 2009, however, the Area 4 fisheries management office surveyed the entire basin as part of the statewide wild trout study. We chose the Coles Creek Basin for examination because the watershed had experienced a 21%+ increase in human population density since 2000 and because the area is likely to experience natural gas drilling in the near future.

All of the streams in the Coles Creek Basin supported wild trout populations. Wild brook trout were dominant over wild brown trout, and wild brook trout populations in three sections were dense enough to reach Class A status. Most of the streams were acidic. Additionally, most lacked suitable habitat for adult trout.

AREA RECOMMENDATIONS:

1. 2010: Add Coles Creek, Section 01; Fallow Hollow, Section 01; and Hess Hollow, Section 01, to the Class A list. Additionally, request that these sections be upgraded to High Quality Cold Water Fishes, Migratory Fishes (HQ-CWF, MF) in Chapter 93.
2. Continue management under Commonwealth Inland Waters angling regulations with no stocking.

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

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

Coles Creek Basin (405C)
Fisheries Management Report

Prepared by:
Robert Wnuk, Aaron Frey, and Jacob Precone

Date Sampled: July/August 2009

Date Prepared: January 2010

Introduction

The Pennsylvania Fish and Boat Commission (PFBC) has recently attempted to document wild trout populations in unsurveyed streams at high risk of development. Personnel from the Area 4 Fisheries Management Office surveyed the Coles Creek Basin in 2009 as part of this effort. The PFBC's GIS system identified the watershed as one that likely supported wild trout and that had experienced an increase in human population density of greater than 21% since 2000.

Coles Creek originates from springs and wetlands on Red Rock Mountain and flows generally south for 10 km to its confluence with Fishing Creek approximately 4.5 km north of the town of Benton. Most of the 31 km² watershed lies within Columbia County, but small portions are contained in Luzerne and Sullivan Counties. There are six named tributaries in the basin (Table 1). State Routes 118 and 487 provide major road access (Figure 1), while the United States Geological Survey's Red Rock and Stillwater 7.5 minute quadrangles provide topographic coverage.

Currently undeveloped forest and agriculture are the main land uses in the Coles Creek Basin, but the region is likely to experience natural gas drilling in the near future. The underlying geology consists primarily of sandstone, siltstone, shale, and some conglomerate from the Devonian Aged Catskill Formation (undivided). Additionally, the Huntley Mountain Formation, which dates from the Mississippian and Devonian Ages, underlies the extreme northern portion of the watershed. This Formation consists of fine-grained sandstone with a few shale interbeds.

Historically, the Coles Creek Basin has received little fisheries management attention. Moase (1986) documented a Class B wild brown trout *Salmo trutta* population in Section 02, and the PFBC included Section 02 in a statewide analysis that examined the effects of the 1991 drought on wild trout populations (Greene and Weber 1993). The lack of fisheries management attention stemmed from the fact that private hunting camps prohibit public access to most of the streams in the watershed.

The PFBC manages all of the streams in the Coles Creek Basin under Commonwealth Inland Waters angling regulations with no stocking. All named tributaries are on the list of reproducing trout waters since they are tributaries to Coles Creek, a documented wild trout water. The Pennsylvania Department of Environmental Protection (DEP) classifies the Coles Creek watershed as Cold Water Fishes and Migratory Fishes (CWF, MF) in its Chapter 93 water quality standards. Chapter 93 classifications control the amount of pollutants that National Pollution Discharge Elimination System (NPDES) permitted facilities can release into receiving waters. The only known NPDES discharge in the Coles Creek Basin originates from the Benton Foundry, a maker of specialty dies, tools, and jigs. This facility discharges to Hess Hollow near its confluence with Coles Creek.

Methods

We surveyed the Coles Creek Basin between July 1 and August 14, 2009. All procedures of the survey followed Marcinko et al. (1986), but we did not collect parking data.

This survey assessed eight sampling stations (Table 2). Physical habitat evaluations followed the United States Environmental Protection Agency's Rapid Bioassessment Protocols for high gradient streams (Barbour et al. 1999). All chemical parameters were measured in the field using a colorimetric method for pH, a mixed indicator for total alkalinity, and EDTA titration for total hardness. We used backpack electrofishing gear to assess fish populations. Backpack setups included a Coffelt unit (Model BP 1C, 200 - 250 volts alternating current) and a Smith-Root unit (Model 12-A POW, 300 - 600 volts pulsed direct current) with a single anode and a rat-tail cathode.

The choice of backpack electrofishing gear depended on station width. We employed the Coffelt unit at the wider stations because the Smith-Root unit was generally ineffective when stream width exceeded 4 m. In this work, we used the Coffelt unit at two sites and the Smith-Root unit at six sites. We identified the fish captured at each site to species with the exception of sculpins *Cottus sp.* Sculpins were only identified to genus because mottled sculpins *Cottus bairdii* and slimy sculpins *Cottus cognatus* are difficult to separate in the field. We rated the abundance of all

fish species captured at electrofishing sites according to the criteria of Young (2007).

We classified all of the trout we captured as being of wild or hatchery origin based on species, coloration, size, and fin wear. We measured the wild trout to 25 mm length groups and gave them an upper caudal fin clip while we noted the hatchery trout but excluded them from further analyses. When we captured at least 30 wild trout at an individual site we made a second electrofishing pass to obtain a Chapman modified Petersen population estimate (Ricker 1975). At all other sites, we considered the number of wild trout captured to be the total population present. We obtained wild trout population abundance and biomass estimates for stream sections by expanding the estimated number and weight of trout at a site to numbers and kilograms per hectare using state average weights calculated on January 12, 2010.

Results and Discussion

Streams in the Coles Creek Basin were relatively short. The longest tributary, Hess Hollow, was to only 2.96 km (Table 3). Streams that flowed off Red Rock Mountain possessed sharp gradients, with the steepest being Coles Creek, Section 01, at 123.6 m/km. In contrast, Coles Creek, Section 02, possessed the most sluggish gradient at 11.6 m/km. Human population density was rural (< 40 persons/km²) for all sections, and landowners prohibited public angling in nearly all cases (Table 4). The only exception was a short stretch of Coles Creek owned by the Boy Scouts of America near the confluence with Fishing Creek.

The mean total physical habitat score for sites in the Coles Creek Basin was 155.09, which fell into the optimal range (Table 5). This value was the highest mean physical habitat score that Fisheries Management Area 4 has recorded during a basin survey. Optimal physical habitat reflected the wooded and relatively undisturbed character of most of the basin. The only basin-wide physical habitat problem was a lack of deeper pools to provide cover for adult fish. Velocity/depth regime was the category with the lowest mean physical habitat score at 13.28.

Chemically, the Coles Creek Basin streams were relatively infertile. Total alkalinity was < 10 mg/l at four (50%) of our sampling sites, and the highest total alkalinity we recorded was 14 mg/l near the mouth of Coles Creek (Table 6). Total hardness ranged from 6 to 20 mg/l, specific conductance ranged from 27 to 74 umhos, and pH ranged from 6.2 to 6.9 standard units. Many of the basin streams were vulnerable to the effects of acid precipitation.

We captured 11 fish species throughout the Coles Creek Basin in 2009 (Tables 7 and 8). Most species had been present during previous work on Coles Creek, but bluegills *Lepomis macrochirus*, pumpkinseeds *Lepomis gibbosus*, and cutlips minnows *Exoglossum*

maxillingua were captured for the first time in 2009. In contrast, green sunfish *Lepomis cyanellus* and brown bullheads *Ameiurus nebulosus* were present historically but absent during our work. Wild brook trout *Salvelinus fontinalis* were the most common fish in the basin, as we captured wild brook trout at each sampling site. Hatchery brook trout, wild and hatchery brown trout, and hatchery rainbow trout *Oncorhynchus mykiss* were also present in the basin.

Wild trout abundance varied among the basin streams (Table 9). We will next discuss specific findings for each stream and section individually, as the PFBC manages on a stream/section basis. This approach will facilitate presenting the resource classifications (Table 10) needed to generate management plans (Pennsylvania Fish and Boat Commission 1997).

Coles Creek, Section 01

Section 01 extended 2.79 km from the headwaters downstream to the confluence with Marsh Run. We sampled at a single station in the section. Station 0101 was located 150 m downstream from a private road crossing on Chimneystack Rod and Gun Club property and was 300 m long. The station possessed a steep gradient with a boulder, rubble, and gravel substrate. Additionally, there was a coating of *Fontinalis* on instream rocks. The site was 2.5 m wide and was generally shallow with little habitat for larger fish.

Water quality at Station 0101 was very acidic. Consequently, the only fish species we found were wild brook and brown trout. We captured 255 wild brook trout ranging from 25 to 174 mm total length and a single wild brown trout measuring between 100 and 124 mm total length (Figure 2). Wild brook trout biomass was 45.60 kg/ha, sufficient to qualify for Class A status.

Members of the Chimneystack Rod and Gun Club expressed a desire to improve adult fish habitat on their property. We referred the Club to the Habitat Management Division and encouraged them in their efforts. Jack dams and other devices that create deeper pools would be welcome at this site.

Coles Creek, Section 02

Section 02 extended 7.21 km from the confluence with Marsh Run downstream to the mouth. We sampled at two stations in the section. Station 0201 was located on Coles Creek Club property at the Route 487 Bridge and was 300 m long. The riparian area along both sides of the stream at Station 0201 showed evidence of recent logging. Station 0202 was located at a trail crossing on Boy Scouts of America property and was 320 m long. Unlike most of the sites in the basin, both Stations 0201 and 0202 possessed good habitat for larger fish.

Water quality in Section 02 was less acidic than in Section 01, and fish species diversity was much better. We found 11 different species at the two sites combined. Wild trout populations were similar at the two sites, and brown trout were dominant over brook trout. In total, we captured 144 wild brown trout ranging from 50 to 399 mm total length and 37 wild brook trout ranging from 50 to 299 mm total length in the section (Figure 3). Wild brown trout biomass was 22.93 kg/ha and wild brook trout biomass was 3.74 kg/ha, sufficient to qualify for Class B status. Wild trout biomass estimates in 2009 were similar to those documented during the original inventory. Moase (1986) estimated 24.06 kg/ha of brown trout and 1.34 kg/ha of brook trout in Section 02.

Station 0202 was located at River Mile 0.18 on Boy Scouts of America property, and it contained the only stretch of land open to the public in the entire Coles Creek Basin. This was also the only station in the basin where we found hatchery trout. We captured three hatchery brook trout, 33 hatchery brown trout, and seven hatchery rainbow trout *Oncorhynchus mykiss* at the site. There are no known private or co-operative nursery stockings in the basin, so we assumed that the hatchery fish had originated from stockings in Fishing Creek.

Chimneystack Run

Chimneystack Run is a 2.93 km long tributary to the upper portion of Coles Creek. It flows entirely across Chimneystack Rod and Gun Club property and its drainage is almost entirely forested. We sampled at a single station on Chimneystack Run that was located 90 m downstream from a trail crossing. Our station was 300 m long and was in the very headwaters of the stream; it ended at the spring from which the stream originated. We sampled this location at the request of club members, who stated that the area possessed deeper pools than most of the stream and would hold larger trout than any other location on the property. Such was indeed the case. The brook trout we captured in Chimneystack Run were larger than those in Coles Creek, Section 01. They ranged from 50 to 249 mm total length, but we only captured 12 of them (Figure 2). Wild brook trout biomass in Chimneystack Run was 6.00 kg/ha (Class D). Wild brook trout was the only species we captured in this acidic stream.

Marsh Run

Marsh Run is a 1.55 km long tributary to Coles Creek just south of Route 118. It contained little flow so we only electrofished from the mouth upstream for 90 m. Nevertheless, we found seven fish species including wild brook and brown trout. We captured one wild brook trout measuring between 150 and 174 mm total length, and four wild brown trout ranging from 50 to 149 mm total length. Because there were multiple age classes of wild brown trout present, this stream qualified for inclusion on the list of reproducing trout waters.

Ashelman Run

Ashelman Run is a 1.16 km long tributary to Coles Creek that is located entirely on Coles Creek Club property. Our single sampling station was at the mouth and was 300 m long. The riparian area at the station was a mixture of mature forest and grassy shrubs that provided partial shading, while the substrate consisted of boulder, cobble, and gravel. Most of the station was shallow and lacked suitable habitat for adult fish.

We found eight fish species in Ashelman Run including wild brook and brown trout. Wild brook trout biomass was 12.04 kg/ha and wild brown trout biomass was 4.77 kg/ha, sufficient to qualify for Class C status. Wild brook trout ranged from 50 to 224 mm total length while wild brown trout ranged from 50 to 199 mm total length (Figure 4).

Fallow Hollow

Fallow Hollow is a 1.58 km long tributary to Coles Creek upstream from Tri Mills. Our single sampling station was located at the edge of a yard 100 m upstream from the mouth and was 305 m long. Boulders and woody debris provided cover for fish and mature trees provided dense shade. The substrate consisted of boulder, cobble, and gravel.

Water quality in Fallow Hollow was acidic and wild brook trout was the only fish species present. We captured 218 wild brook trout ranging from 25 to 249 mm total length (Figure 5). Wild brook trout biomass was 43.75 kg/ha, sufficient to qualify for Class A status.

Hess Hollow

Hess Hollow is a 2.96 km long tributary to Coles Creek downstream from Tri Mills. Our single sampling station was located at an old bridge downstream from an electric substation and was 300 m long. The station was located upstream from the Benton Foundry NPDES discharge. Its riparian area was a mixture of mature forest and open areas, and its substrate consisted of boulder, silt, sand, and gravel. Pocket pools and woody debris provided cover.

We found five fish species in Hess Hollow including wild brook and brown trout. Wild brook trout ranged from 25 to 249 mm total length while wild brown trout ranged from 100 to 249 mm total length (Figure 5). Wild brook trout biomass was 33.75 kg/ha, sufficient to qualify for Class A status. Wild brown trout biomass was 8.44 kg/ha.

MANAGEMENT RECOMMENDATIONS

1. 2010: Add Coles Creek, Section 01; Fallow Hollow, Section 01; and Hess Hollow, Section 01, to the Class A list. Additionally, request that these sections be upgraded to High Quality Cold Water Fishes, Migratory Fishes (HQ-CWF, MF) in Chapter 93.
2. Continue management under Commonwealth Inland Waters angling regulations with no stocking.

LITERATURE CITED

- Barbour, M., J. Gerritsen, B. Snyder, and J. Stribling. 1999. Rapid bioassessment protocols for use in wadeable streams and rivers: periphyton, benthic macroinvertebrates, and fish, second edition. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.
- Greene, R.T., and R.J. Weber. 1993. Statewide 1991 drought study analysis. Pennsylvania Fish and Boat Commission, Bellefonte.
- Marcinko, M., R. Lorson, and R. Hoopes. 1986. Procedures for stream and river inventory information input. Pennsylvania Fish and Boat Commission, Bellefonte.
- Moase, R. 1986. Coles Creek (405C) management report. Pennsylvania Fish and Boat Commission, Bellefonte.
- Ricker, W.E. 1975. Computation and interpretation of biological statistics of fish populations. Fisheries Research Board of Canada Bulletin 191.
- Young, L. 2007. Memo to Area Fisheries Managers re: DFM sampling protocols for wadeable warmwater streams. Pennsylvania Fish and Boat Commission files, Bellefonte.

Table 1. Named streams of the Coles Creek (405C) Basin listed in hierarchical order.

| Stream |
|-------------------------|
| Coles Creek, Section 01 |
| Chimneystack Run |
| Marsh Run |
| Coles Creek, Section 02 |
| Ashelman Run |
| Fallow Hollow |
| Hess Hollow |

=====

Table 2. Station number, river mile, downstream limit, length electrofished, and voltage for stations sampled during 2009 in the Coles Creek Basin (405C).

| Stream | Station Number | River Mile | Downstream limit | Length (m) | Volts |
|------------------|----------------|------------|--|------------|--------|
| Coles Creek | 0101 | 5.28 | 150 m downstream private road crossing | 300 | 400 DC |
| | 0201 | 3.54 | Route 487 | 300 | 250 AC |
| | 0202 | 0.18 | Split at Boy Scout trail crossing | 320 | 200 AC |
| Chimneystack Run | 0101 | 1.22 | 90 m downstream from trail crossing | 300 | 600 DC |
| Marsh Run | 0101 | 0.00 | Mouth | 90 | 300 DC |
| Ashelman Run | 0101 | 0.00 | Mouth | 300 | 300 DC |
| Fallow Hollow | 0101 | 0.09 | Yard edge 100 m upstream from mouth | 305 | 400 DC |
| Hess Hollow | 0101 | 0.18 | Old bridge downstream from substation | 300 | 400 DC |

Table 3. Physical data for stream sections in the Coles Creek Basin (405C).

| Stream (Section) | Length (km) | Width (m) | Gradient (m/km) | County (Percent) | USGS Quadrangle(s) |
|-----------------------|----------------|--------------|--------------------|------------------------------|-----------------------|
| Coles Creek (01) | 2.79 | 2.50 | 123.6 | Columbia (78); Sullivan (22) | H35 |
| Coles Creek (02) | 7.21 | 6.03 | 11.6 | Columbia (100) | H35, I35 |
| Chimneystack Run (01) | 2.93 | 2.10 | 100.0 | Columbia (100) | H35 |
| Marsh Run (01) | 1.55 | 0.60 | 20.0 | Columbia (51); Luzerne (49) | H35 |
| Ashelman Run (01) | 1.16 | 1.70 | 31.6 | Columbia (100) | H35 |
| Fallow Hollow (01) | 1.58 | 2.60 | 36.0 | Columbia (100) | H35 |
| Hess Hollow (01) | 2.96 | 2.80 | 31.2 | Columbia (100) | H35 |

USGS Quadrangles: H35 = Red Rock; I35 = Stillwater

Table 4. Social data for stream sections in the Coles Creek Basin (405C).

| Stream (Section) | Road Access: | | | Ownership | | | 2000 Human Population Density |
|-----------------------|---------------------|-------|-------|---------------------|----------------------|------------------------|-------------------------------------|
| | % of Section Within | | | % Public Open | % Private Open | % Private Closed | |
| | 100 m | 300 m | 500 m | | | | |
| Coles Creek (01) | 10 | 5 | 1 | 0 | 0 | 100 | 6 |
| Coles Creek (02) | 63 | 100 | 100 | 0 | 10 | 90 | 13 |
| Chimneystack Run (01) | 5 | 11 | 17 | 0 | 0 | 100 | 13 |
| Marsh Run (01) | 30 | 92 | 100 | 0 | 0 | 100 | 11 |
| Ashelman Run (01) | 90 | 48 | 14 | 0 | 0 | 100 | 13 |
| Fallow Hollow (01) | 64 | 80 | 100 | 0 | 0 | 100 | 13 |
| Hess Hollow (01) | 38 | 90 | 100 | 0 | 0 | 100 | 13 |

Table 5. Mean physical habitat scores with standard deviations for streams in the Coles Creek Basin (405C). All scores were determined using the method for high gradient sites.

| Parameter | Mean | Standard Deviation |
|------------------------|-------------|--------------------|
| Substrate/Cover | 14.57 | 2.07 |
| Embeddedness | 15.14 | 1.77 |
| Velocity/Depth | 13.28 | 2.63 |
| Sediment Deposition | 14.00 | 2.94 |
| Channel Flow Status | 17.00 | 1.15 |
| Channel Alteration | 16.71 | 2.06 |
| Riffle Frequency | 18.00 | 0.58 |
| Bank Stability: | | |
| Left Bank | 7.71 | 1.71 |
| Right Bank | 7.71 | 1.50 |
| Bank Total | <hr/> 15.42 | |
| Vegetative Protection: | | |
| Left Bank | 7.41 | 1.27 |
| Right Bank | 7.57 | 1.40 |
| Bank Total | <hr/> 14.98 | |
| Riparian Zone Width: | | |
| Left Bank | 7.71 | 1.89 |
| Right Bank | 8.28 | 1.80 |
| Bank Total | <hr/> 15.99 | |
| Total Score: | 155.09 | |

Table 6. Physical-chemical data collected at sampling stations in the Coles Creek Basin (405C) during 2009.

| Stream | River Mile | Date | Time | Air Temp. °C | Water Temp. °C | pH | Total Alkalinity (mg/l) | Total Hardness (mg/l) | Specific Conductance (umhos) |
|------------------|---------------|------|------|--------------------|----------------------|-----|-------------------------------|-----------------------------|------------------------------------|
| Coles Creek | 5.28 | 7/08 | 0900 | 14.0 | 12.5 | 6.4 | 7 | 8 | 28 |
| | 3.54 | 8/14 | 1035 | 20.0 | 16.0 | 6.8 | 10 | 14 | 60 |
| | 0.18 | 7/09 | 1330 | 22.0 | 14.5 | 6.9 | 14 | 16 | 74 |
| Chimneystack Run | 1.22 | 7/08 | 1130 | 17.0 | 11.7 | 6.2 | 5 | 6 | 27 |
| Marsh Run | 0.00 | 7/08 | 1350 | 18.0 | 15.7 | 6.6 | 10 | 10 | 58 |
| Ashelman Run | 0.00 | 8/14 | 1030 | 20.0 | 18.6 | 6.7 | 7 | 13 | 45 |
| Fallow Hollow | 0.09 | 7/01 | 1130 | 23.0 | 13.0 | 6.8 | 8 | 14 | 46 |
| Hess Hollow | 0.18 | 7/09 | 1110 | 23.0 | 13.6 | 6.8 | 12 | 20 | 58 |

Table 7. Scientific and common names of fish species captured in the Coles Creek Basin (405C) during current and historic work.

| Scientific name | Common name | 2009 | Historic |
|--------------------------------|----------------|-----------|-----------|
| <i>Salvelinus fontinalis</i> | Brook trout | (8) | X |
| <i>Salmo trutta</i> | Brown trout | (6) | X |
| <i>Oncorhynchus mykiss</i> | Rainbow trout | (1) | X |
| <i>Lepomis macrochirus</i> | Bluegill | (3) | |
| <i>Lepomis gibbosus</i> | Pumpkinseed | (3) | |
| <i>Lepomis cyanellus</i> | Green sunfish | | X |
| <i>Ameiurus nebulosus</i> | Brown bullhead | | X |
| <i>Semotilus atromaculatus</i> | Creek chub | (3) | X |
| <i>Exoglossum maxillingua</i> | Cutlips minnow | (1) | |
| <i>Rhinichthys atratulus</i> | Blacknose dace | (5) | X |
| <i>Rhinichthys cataractae</i> | Longnose dace | (2) | X |
| <i>Cottus sp.</i> | Sculpins | (5) | X |
| <i>Catostomus commersonii</i> | White sucker | (4) | X |
| Total Species: | | 11 | 10 |

(##) = Number of sites within the basin where each species was captured during the 2009 survey.

Table 8. Density ratings for fish species captured in the Coles Creek (405C) Basin during 2009.

| Common name | Coles Creek | | | Chimneystack Run | Marsh Run | Ashelman Run | Fallow Hollow | Hess Hollow |
|-----------------------|-------------|----------|----------|------------------|-----------|--------------|---------------|-------------|
| | RM 5.28 | RM 3.54 | RM 0.18 | RM 1.22 | RM 0.00 | RM 0.00 | RM 0.09 | RM 0.18 |
| Brook trout | A | P | P | P | P | C | A | A |
| Brown trout | R | C | C | | P | P | | P |
| Rainbow trout | | | P | | | | | |
| Bluegill | | | R | | | P | | R |
| Pumpkinseed | | P | | | P | P | | |
| Creek chub | | P | | | X | R | | |
| Cutlips minnow | | | C | | | | | |
| Blacknose dace | | C | A | | X | A | | P |
| Longnose dace | | R | C | | | | | |
| Sculpin | | C | A | | X | C | | C |
| White sucker | | P | P | | X | P | | |
| Total species: | 2 | 8 | 9 | 1 | 7 | 8 | 1 | 5 |

RM = River Mile.

Density ratings per 300 m: A= Abundant (> 100); C = Common (26 - 100); P = Present (3 - 25); R = Rare (< 3); X = Species captured but not rated.

Table 9. Wild trout abundance estimates for the Coles Creek (405C) Basin in 2009.

| Water (Section) | Species | Biomass (Kilograms per Hectare) | Number per Hectare | Number per Kilometer | Number of Legals per Kilometer | Number of Legals in Section |
|-----------------------|----------------|--|--------------------------|----------------------------|---|-----------------------------------|
| Coles Creek (01) | Brook | 45.60 | 5,080 | 1,270 | 0 | 0 |
| | Brown | 0.19 | 13 | 3 | 0 | 0 |
| | Totals: | 45.79 | 5,093 | 1,273 | 0 | 0 |
| Coles Creek (02) | Brook | 3.74 | 110 | 64 | 11 | 79 |
| | Brown | 22.93 | 473 | 287 | 83 | 598 |
| | Totals: | 26.67 | 583 | 351 | 97 | 677 |
| Chimneystack Run (01) | Brook | 6.00 | 191 | 40 | 6 | 18 |
| Marsh Run (01) | Brook | 7.59 | 185 | 11 | 0 | 0 |
| | Brown | 10.62 | 740 | 44 | 0 | 0 |
| | Totals: | 18.21 | 925 | 55 | 0 | 0 |
| Ashelman Run (01) | Brook | 12.04 | 1,433 | 243 | 10 | 12 |
| | Brown | 4.77 | 157 | 27 | 7 | 8 |
| | Totals: | 16.81 | 1,590 | 270 | 17 | 20 |
| Fallow Hollow (01) | Brook | 43.75 | 4,540 | 1,182 | 13 | 21 |
| Hess Hollow (01) | Brook | 33.75 | 2,680 | 750 | 23 | 68 |
| | Brown | 8.44 | 143 | 39 | 23 | 68 |
| | Totals: | 42.19 | 2,823 | 789 | 46 | 136 |

Table 10. Pennsylvania Fish and Boat Commission (PFBC) and Pennsylvania Department of Environmental Protection (DEP) classifications with recommended DEP upgrades and PFBC management programs for stream sections in the Coles Creek Basin (405C).

| Stream (Section) | Classification | | Recommended DEP Upgrade | Recommended PFBC Management Program |
|-----------------------|----------------|------------|----------------------------|--|
| | PFBC | DEP | | |
| Coles Creek (01) | A R4 | CWF, MF | HQ-CWF, MF | Class A/Statewide Regulations |
| Coles Creek (02) | BLR3 | CWF, MF | None | Statewide Regulations |
| Chimneystack Run (01) | D R4 | CWF, MF | None | Statewide Regulations |
| Marsh Run (01) | C R4 | CWF, MF | None | Statewide Regulations |
| Ashelman Run (01) | C R4 | CWF, MF | None | Statewide Regulations |
| Fallow Hollow (01) | A R4 | CWF, MF | HQ-CWF, MF | Class A/Statewide Regulations |
| Hess Hollow (01) | A R4 | CWF, MF | HQ-CWF, MF | Class A/Statewide Regulations |

CWF = Cold Water Fishes; HQ-CWF = High Quality Cold Water Fishes, MF = Migratory Fishes.

Figure 1. Coles Creek drainage basin (405C).

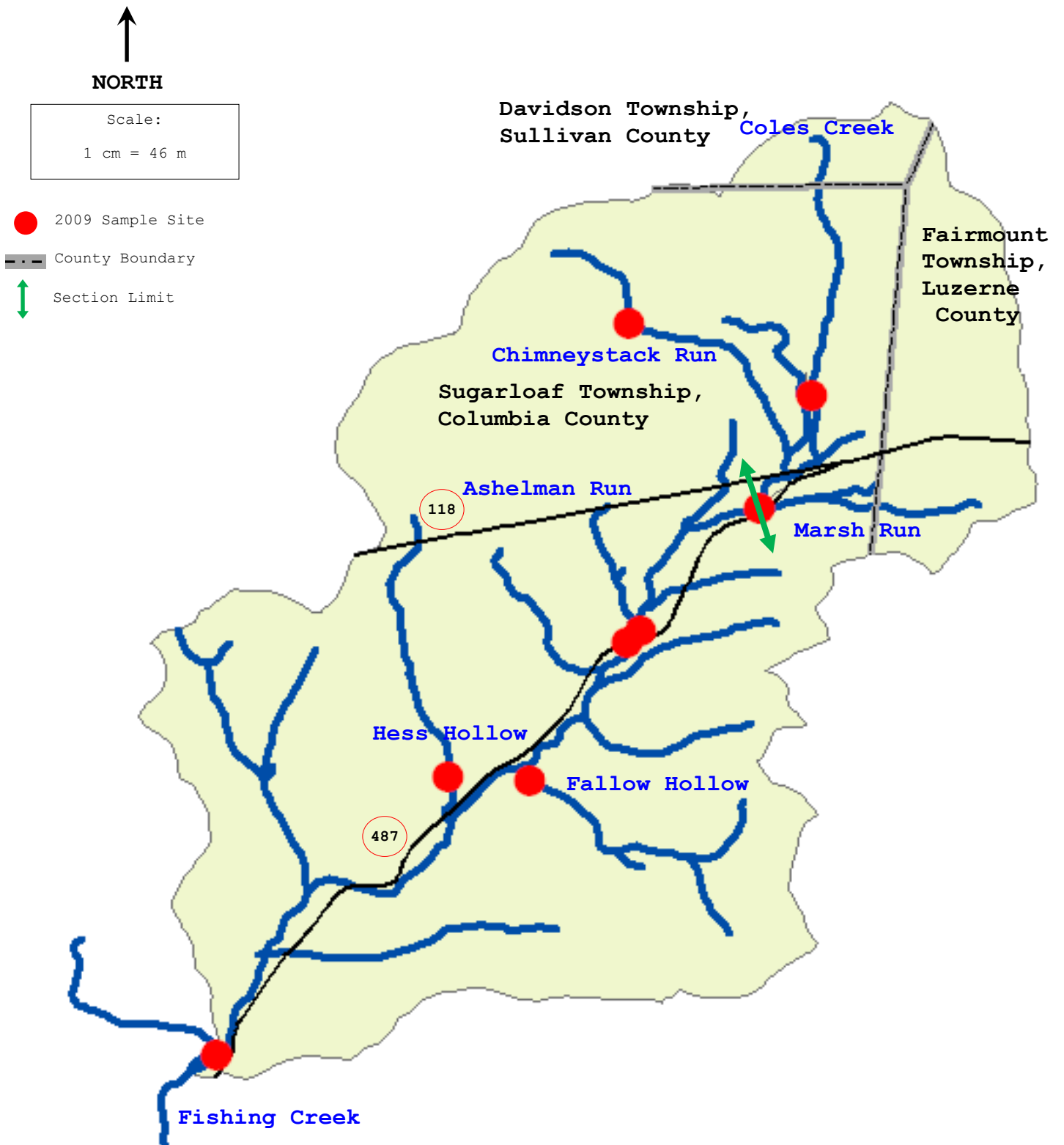


Figure 2. Length-frequency distributions of wild brook trout captured in Coles Creek, (405C) Section 01, and Chimneystack Run, (405C) Section 01, during 2009.

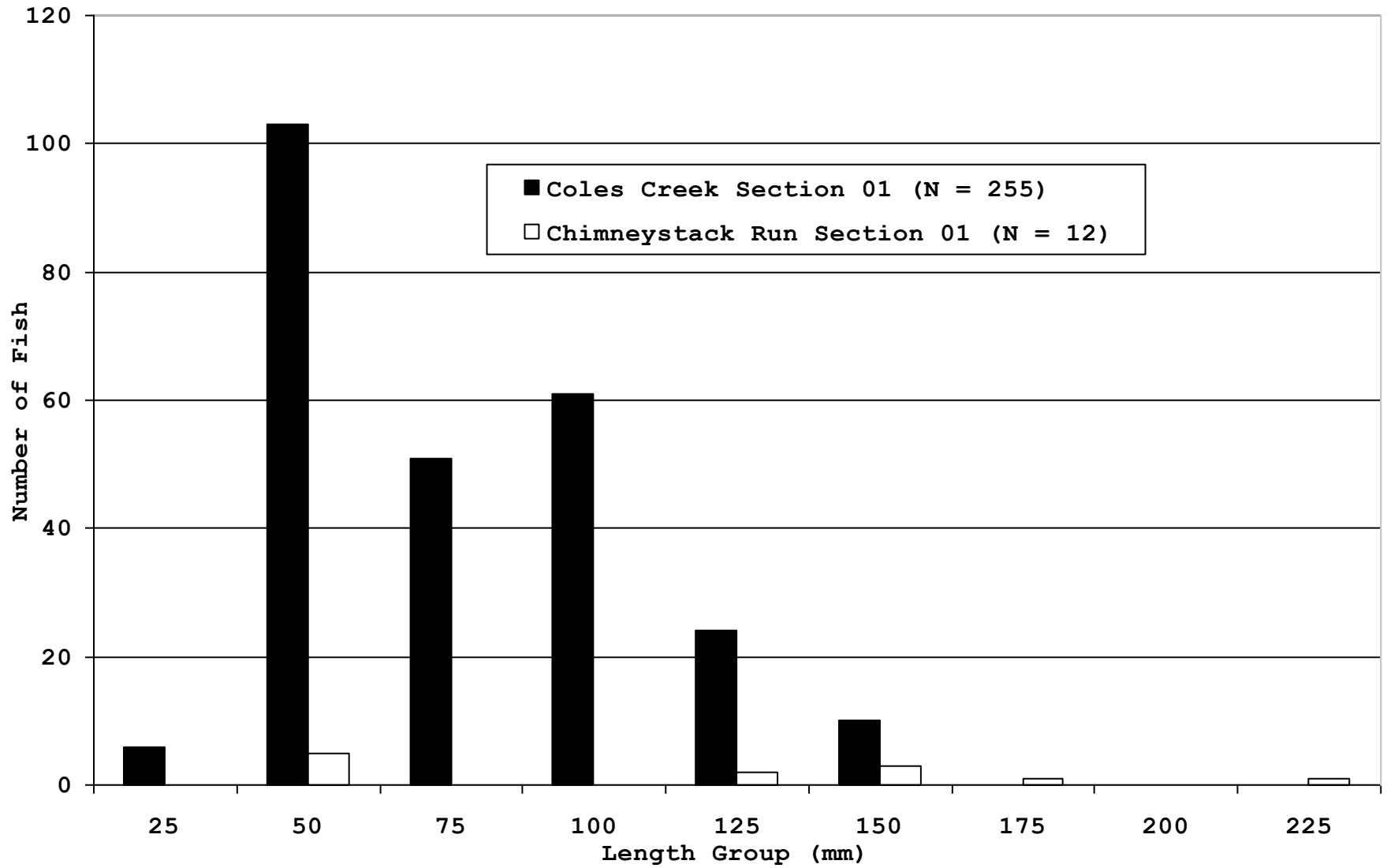


Figure 3. Length-frequency distributions of wild brook and brown trout captured in Coles Creek, (405C) Section 02, during 2009.

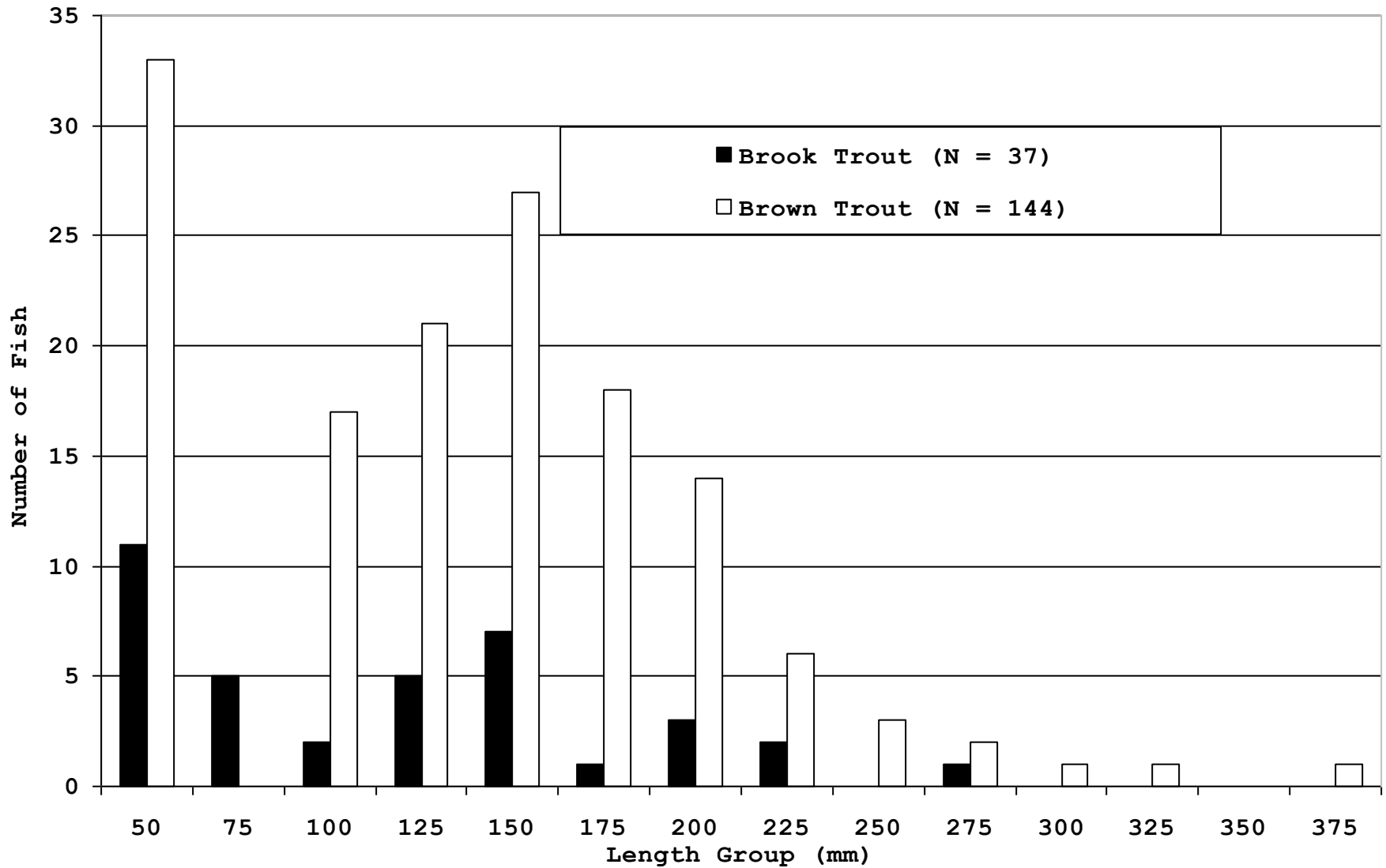


Figure 4. Length-frequency distributions of wild brook and brown trout captured in Ashelman Run, (405C) Section 01, during 2009.

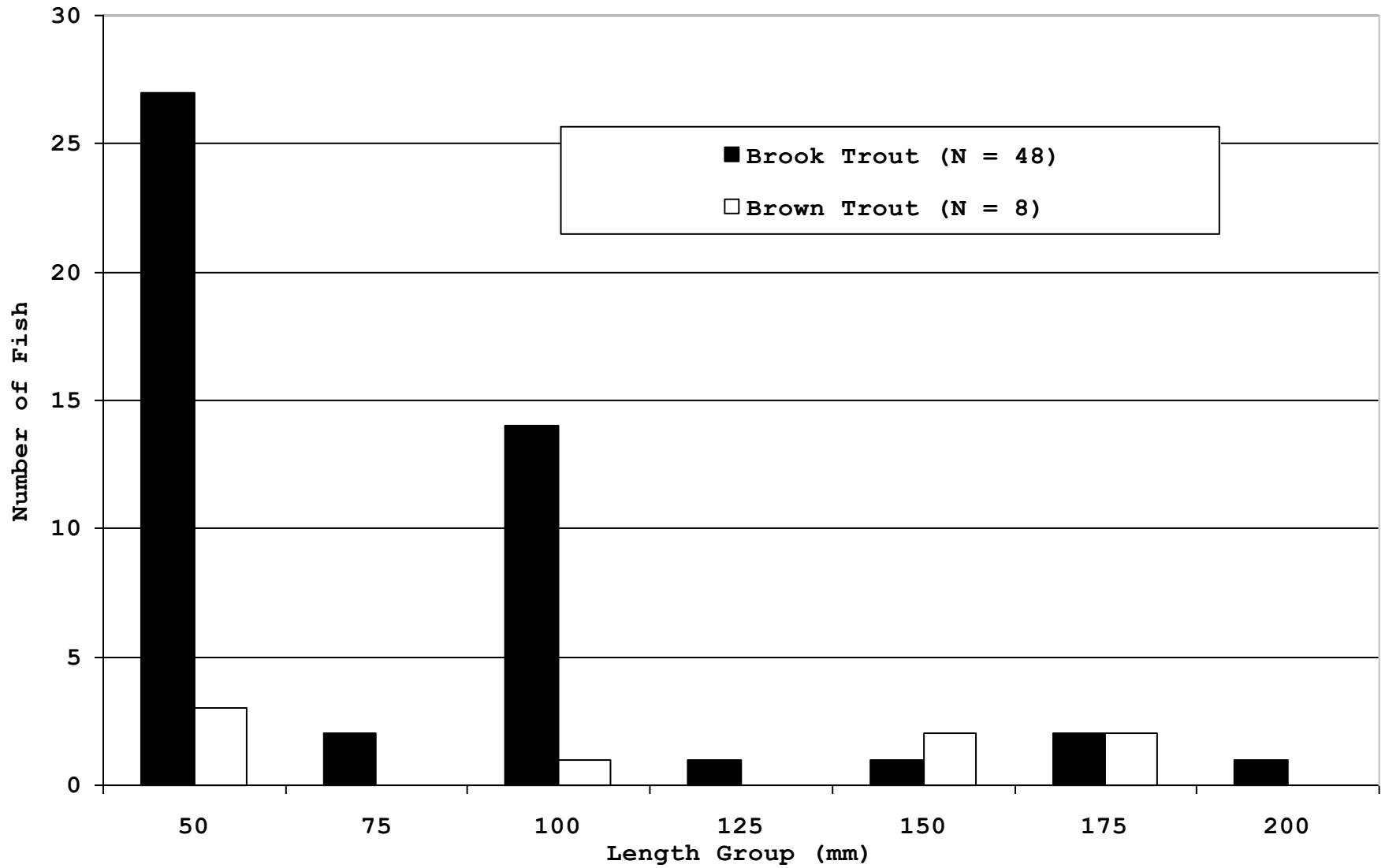
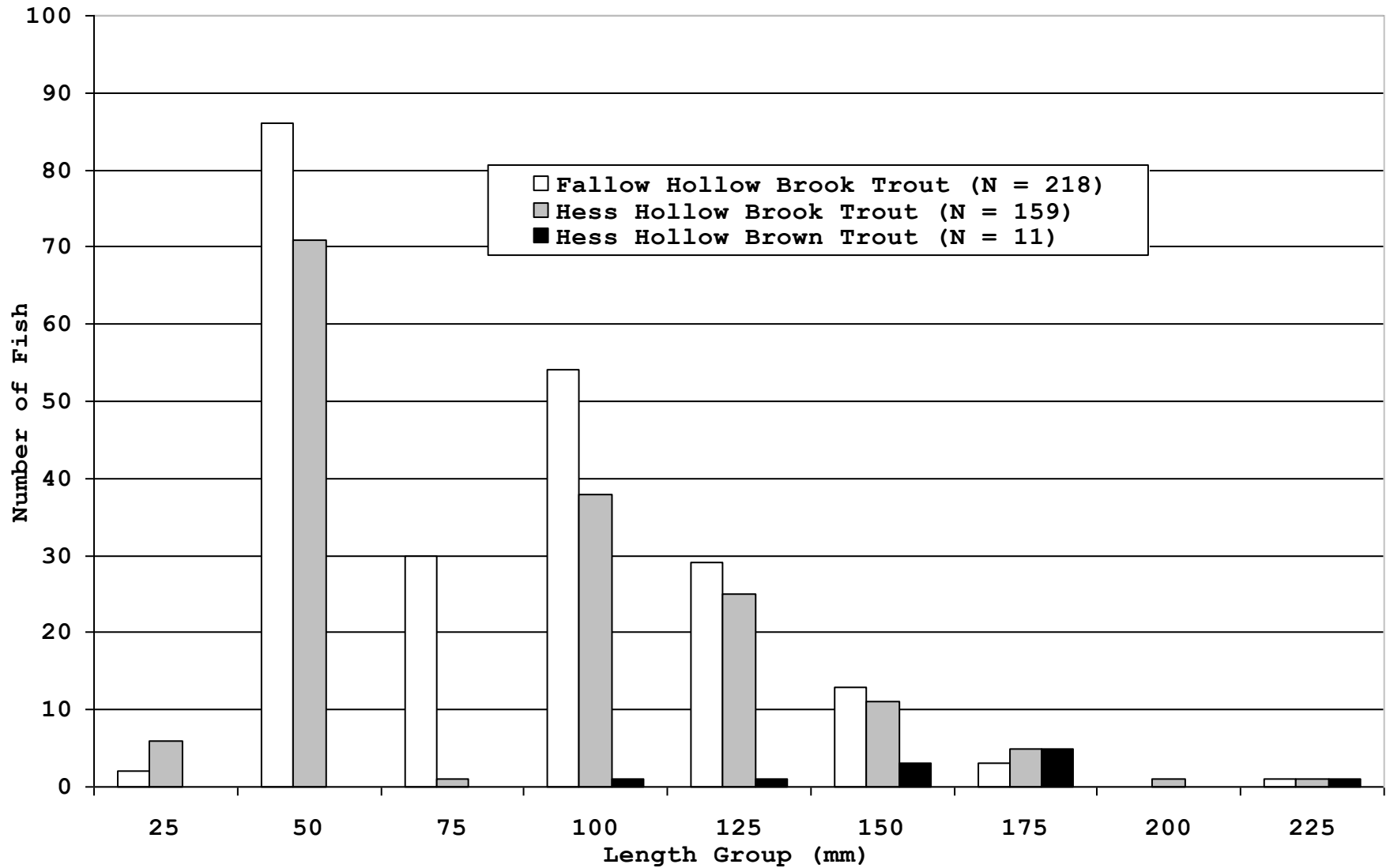


Figure 5. Length-frequency distributions of wild brook trout captured in Fallow Hollow, (405C) Section 01, and wild brook and brown trout captured in Hess Hollow, (405C) Section 01, during 2009.



DISTRIBUTION

NC Regional Law Enforcement Manager

M. Pisko, District 5072 Waterways Conservation Officer

R. Greene, Coldwater Unit Leader

D. Miko, Fisheries Management Division Chief

J. Arway, PFBC Environmental Services (Chapter 93 upgrades)

Mr. Sam Ganshaw
PO Box 633
Mifflinville, PA 18631

Mr. Daniel M. Hartman
PO Box 284
Market Street
Benton, PA 17814