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PENNSYLVANIA FISH AND BOAT COMMISSION
BUREAU OF FISHERIES
FISHERIES MANAGEMENT DIVISION

Nescopeck Creek Basin (405D) Fisheries Management Report

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Introduction

There is a substantial fishery resource in the 40,000+ miles of flowing water throughout Pennsylvania. To realize the potential of this resource the Pennsylvania Fish and Boat Commission (PFBC) has established a policy of resource examination and classification. The primary objectives of the examination are the documentation of the state of the fishery and the collection of social, physical, and chemical data that influence how the fishery can be utilized. Establishing relationships among these parameters allows each individual stream section to be classified and placed into a resource category. Once assignment to a resource category has been completed a management program that is consistent with statewide goals and objectives can be implemented.

The Area 4 fisheries management office has been conducting stream examinations on a drainage basin level to facilitate management by resource classification. The Nescopeck Creek basin was selected for investigation in 1999 because the fisheries in many of the streams in this relatively large drainage basin had never been documented. Additionally, the information we had on previously surveyed streams was fairly dated. Thus, the objectives of this examination were: 1) to provide baseline data on the fishery in those streams which had never been surveyed so that they could be assigned to a resource category and 2) to evaluate past management practices on previously surveyed streams and implement new management strategies where appropriate.

Study Area

Nescopeck Creek originates at the confluence of Creasy Creek and the upstream outlet of Lake Olympus in Dennison Township, Luzerne County. The stream flows generally west for 57 km to its confluence with the North Branch of the Susquehanna River at River Mile (RM) 35.30 in the borough of Nescopeck (Figure 1). The 451 km^2 drainage basin lies primarily in Luzerne County but also encompasses small

portions of Schuylkill and Columbia Counties. Major roads that provide access to the basin include Interstate 80, Interstate 81, State Route 93, and State Route 309. The entire watershed can be located on the United States Geological Surveys' (USGS) 7.5 minute quadrangles of Berwick, Conyngham, Freeland, Hazleton, Mifflinville, Nuremberg, Sybertsville, Weatherly, White Haven, and Wilkes-Barre East, Pennsylvania.

The Nescopeck Creek watershed contains 13 named streams (Table 1), 7 named reservoirs, and numerous unnamed tributaries, strip pits, farm ponds, and wetlands. Interestingly, 2 of the 13 named streams in the basin are designated as Little Nescopeck Creek. For the purposes of this report, these two streams will be referred to as Little Nescopeck Creek^{A} and Little Nescopeck Creek^{B}. Little Nescopeck Creek^{A} enters Nescopeck Creek at RM 36.58 near Lake Olympus while Little Nescopeck Creek^{B} enters Nescopeck Creek at RM 17.40 near Sybertsville.

Copeland (1991a) and Perry (1987) provide detailed descriptions of geology and land use in the Nescopeck Creek basin. The underlying geology is generally composed of infertile shales, sandtones, and conglomerates in combination with minable deposits of anthracite coal. Land use is a mixture of forests, mined areas, agricultural areas, and several relatively large urban centers. Forested lands include State Game Lands (SGL) 187, SGL 119, and Nescopeck State Park (Figure 2). Mined areas include inactive strip mines and deep mines, 10 active refuse coal processing operations, and 8 active strip mining operations (Nasilowski 1996). The major urban centers in the basin are Berwick, Conyngham, Freeland, Hazleton, Nescopeck, and, peripherally, White Haven. Point sources of pollution in the drainage include 3 acid mine drainage tunnels and 10 National Pollution Discharge Elimination System (NPDES) permitted discharges (Appendix A). Most of the NPDES discharges originate from sewage treatment plants.

Historical Perspective

The PFBC has surveyed the main stem of Nescopeck Creek on four previous occasions. The first, by Miller et al. in 1964, was a single station rotenone sample conducted within the boundaries of SGL 187. This study documented the presence of 12 fish species including a small population of wild brown trout. The investigators recommended that the PFBC stock adult brown trout in this section of stream.

Daniels et al. (1979) conducted the next PFBC survey of Nescopeck Creek as part of the statewide inventory of trout stocked waters. The investigators surveyed the full length of the stream from the upstream border of SGL 187 downstream to the mouth. Warmwater fishes were dominant downstream to the confluence with Little

Nescopeck Creek[B] but small wild trout populations were present in the upper portions of the stream. The main stem of Nescopeck Creek downstream from the confluence with Little Nescopeck Creek[B] was biologically dead because of acid mine drainage and industrial wastes originating from Little Nescopeck[B] and Black Creeks. As a result of this survey the stocking limits on Nescopeck Creek were extended downstream and it was recommended that rainbow trout (*Oncorhynchus mykiss*) should not be stocked because of low springtime pH.

Spotts (1988) conducted the next PFBC survey of Nescopeck Creek. Spotts' work was done in conjunction with a United States Fish and Wildlife Service examination of the Nescopeck watershed (Perry 1987) which sought to determine the potential biological impacts of constructing a controversial 336 ha reservoir and accompanying state park complex. Spotts sampled at two stations on Nescopeck Creek and at six stations on unnamed tributaries. Small wild brook and brown trout populations were found in Nescopeck Creek. The unnamed tributaries supported wild brook trout populations ranging from 27.9 to 133.5 kg/ha. Both Spotts (1988) and Perry (1987) recommended against the proposed dam.

Copeland (1991a) conducted the most recent PFBC survey of Nescopeck Creek. Copeland sampled at seven stations on Nescopeck Creek from the upstream SGL 187 boundary downstream to T-364. The objective of this work was to determine if any portion of this section was suitable for Delayed Harvest management. As in previous surveys, Nescopeck Creek supported small wild trout populations and a fairly diverse community of fish species indicative of warmwater stream habitats. Following this survey, the portion of Nescopeck Creek from the upstream SGL 187 boundary downstream to the old bridge south of Lake Francis was approved for Delayed Harvest management.

The PFBC has also conducted biological surveys on Oley Creek and Long Hollow. It should be noted that in previous PFBC surveys Long Hollow was mistakenly identified as the headwaters of Oley Creek. Daniels et al. (1976) examined Oley Creek and Long Hollow as part of the statewide inventory of trout stocked waters. The investigators documented a Class A wild brook trout population in Long Hollow and a marginal Class B wild brook and brown trout population in Oley Creek. Copeland (1991b) documented that wild trout biomass in Oley Creek increased from a marginal to a solid Class B population following the 1980 termination of trout stocking. Copeland (1991b) also documented that the brook trout population in Oley Creek had expanded at the expense of the brown trout population.

There have been two other biological surveys conducted in the Oley Creek drainage. The Pennsylvania Department of Environmental Protection (DEP) surveyed Oley Creek following a PFBC

recommendation to upgrade the streams Chapter 93 water quality classification (DEP 1990). The investigators characterized instream water quality as excellent and recommended that the Oley Creek basin upstream from the lower SGL 187 boundary be upgraded to high quality coldwater fishery (HQ-CWF). Spotts (1989) surveyed an unnamed tributary to Oley Creek. He documented four fish species and a combined wild brook and brown trout biomass of 12.76 kg/ha.

The USGS, the Susquehanna River Basin Commission (SRBC), and the DEP have conducted water quality and biological sampling in the Nescopeck Creek basin. The USGS documented water quality parameters of the Jeddo Tunnel mine discharge to Little Nescopeck Creek[B] in 1975 and again in 1991 (Wood 1996). Both surveys determined that the Jeddo Tunnel was a major source of water quality degradation to Little Nescopeck[B] and Nescopeck Creeks, but the 1991 data showed that water quality from the discharge was improving with time.

The SRBC studied water quality in Nescopeck, Little Nescopeck[B], and Black Creeks in conjunction with their 1982 survey of the upper Susquehanna River watershed (Malione et al. 1984). This study documented that Black Creek, Little Nescopeck Creek[B], and Nescopeck Creek downstream from its confluence with Little Nescopeck Creek[B] were grossly polluted by acid mine drainage and sewage. Fish were absent from all three stream reaches.

The DEP sampled water quality and point source pollution in Nescopeck, Little Nescopeck[B], and Black Creeks during the summer of 1998 (Kupsky 1999). Kupsky (1999) documented that mine drainage from the Jeddo Tunnel caused severe biological impacts from its confluence with Little Nescopeck Creek[B] downstream to the mouth of Nescopeck Creek. Black Creek was independently affected by a combination of acid mine drainage and combined sewer overflows (CSO). The CSO's primarily originated in Hazleton but their effects could not be quantified because of the degradation caused by acid mine drainage. Kupsky (1999) did note that the Hazleton sewage treatment plant discharge improved water quality in Black Creek through the addition of 3,682.9 pounds of alkalinity per day and that it met its permit limits on June 30, 1998. Nevertheless, he saw ample evidence of excessive organic solids loading to Black Creek from the sewage treatment plant bypass that could potentially cause health and aesthetic problems over a large downstream area.

Finally, the DEP, in conjunction with the USGS, the SRBC, the Wildlands Conservancy, and several area universities and citizens' groups, has been monitoring water quality in the Jeddo Tunnel discharge as part of an on-going mine drainage rehabilitation effort in the Little Nescopeck Creek[B] watershed. Plans for the rehabilitation of the watershed include the reclamation of abandoned mines, the restoration of surface flows to decrease infiltration into the tunnel, the prevention of sewage flow into

the tunnel, and the arrangement of passive treatment facilities within the drainage net.

The results of all historical surveys in the Nescopeck Creek basin have led to the development of current DEP and PFBC management strategies for surveyed waters in the drainage. These management strategies are presented below.

Current Management Strategies

The DEP classifies the majority of the streams in the Nescopeck Creek basin as coldwater fisheries (CWF) in its Chapter 93 water quality standards. Exceptions include the Nescopeck Creek basin from the headwaters downstream to the State Route 309 bridge, the main stem of Nescopeck Creek downstream from the State Route 309 bridge, and the Oley Creek basin upstream from the most downstream border of SGL 187. The upper portion of the Nescopeck Creek basin (exclusive of the Creasy Creek and Little Nescopeck Creek[A] drainages) and the upper portion of the Oley Creek basin are classified as HQ-CWF, while the lower portion of the main stem of Nescopeck Creek is classified as a trout stocked fishery (TSF).

For the purposes of resource classification the PFBC manages all of the streams in the Nescopeck Creek basin as a single section extending from the headwaters downstream to the mouth with the following exceptions (Table 2):

Nescopeck Creek

Section 01:	From the headwaters downstream to the upstream boundary of SGL 187
Section 02:	From the upstream boundary of SGL 187 downstream to the old bridge south of Lake Francis
Section 03:	From the old bridge south of Lake Francis downstream to the county road downstream from I 81
Section 04:	From the county road downstream from I 81 downstream to Little Nescopeck Creek[B]
Section 05:	From Little Nescopeck Creek[B] downstream to Black Creek
Section 06:	From Black Creek downstream to the mouth

Little Nescopeck Creek[A]

Section 01:	From the headwaters downstream to the first unnamed tributary downstream from Tunnel
Section 02:	From the first unnamed tributary downstream from Tunnel downstream to the mouth

Oley Creek

Section 01:	From the confluence with Long Hollow downstream to I 80 Mile Marker 265
Section 02:	From I 80 Mile Marker 265 downstream to the mouth

Black Creek

Section 01:	From the headwaters downstream to SR 309
Section 02:	From SR 309 downstream to SR 3020
Section 03:	From SR 3020 downstream to the mouth

The PFBC manages Section 02 of Nescopeck Creek as a stocked trout water under Delayed Harvest Artificial Lures Only regulations and Section 03 of Nescopeck Creek as a stocked trout water under statewide angling regulations. The classification of Section 03 is Optimum Yield 2 - Rural. Rainbow trout are not stocked in either section because of potentially acidic water quality during the spring months. The PFBC does not currently stock adult trout in any of the other streams in the Nescopeck Creek basin. Nescopeck Creek was once stocked over a longer length than it is today but the downstream portion was removed because of landowner posting in 1982. Oley Creek was removed from the approved trout stocking list in 1980 because of its small size, limited parking, poor angler access, and wild brook trout population.

The PFBC does not actively manage Sections 05 and 06 of Nescopeck Creek, Sections 01 - 03 of Black Creek, and Little Nescopeck Creek[B] because these sections are polluted by acid mine drainage and do not support fish life. The PFBC manages the remainder of the streams in the basin for their natural fish populations under conventional, statewide angling regulations.

Methods

The examination of the Nescopeck Creek basin was conducted in July, August, and September of 1999. All procedures of the survey were carried out according to Marcinko et al. (1986).

We surveyed 13 named streams in the Nescopeck Creek basin encompassing 22 stream sections. We collected physical and some social data for all named stream sections but did not assess parking or ownership characteristics. Additionally, we surveyed 19 of the unnamed tributaries in the basin. To distinguish the unnamed tributaries in this report we numbered the ones we sampled beginning with the tributary closest to the mouth. We collected physical but no social data for the unnamed tributaries.

We assessed physical, chemical, and biological characteristics at 48 sampling stations (Tables 3 and 4; Figure 3). We did not establish sampling stations in Section 01 of Nescopeck Creek, Section 01 of Mill Creek, and Section 02 of Oley Creek because these sections did not have any public access. Additionally, we did not establish sampling stations in Section 01 of Black Creek, Cranberry Creek, Unnamed Tributary 10, and Unnamed Tributary 14 because these sections were dry at the time of our survey.

Physical characteristics at each station were assessed visually. Chemical characteristics were assessed in the field using a mixed indicator for alkalinity, a colorimetric method for pH, and EDTA titration for hardness. Fish communities were assessed with backpack electrofishing gear. We used a Coffelt backpack electrofisher (Model BP-1C, alternating current) with two electrodes to capture fish at 10 sites, and a Smith-Root backpack electrofisher (Model 12-A POW, pulsed direct current) with a single anode and a rat-tail cathode to capture fish at 22 sites. We did not electrofish at 16 sites because of low flows and/or poor water quality. The scientific and common names of all fish species captured in the Nescopeck Creek basin (Table 5) follow Robins et al. (1991). We identified the fish we captured at each site to species with the exception of sculpins. Sculpins were only identified to genus because it was difficult to accurately separate mottled from slimy sculpins in the field.

We classified all of the trout we captured as being of wild or hatchery origin based on species, coloration, size, and fin wear. Wild trout were measured to 25 mm length groups and given an upper caudal fin clip while hatchery trout were noted but excluded from further analysis. At sites where we captured $\geq$ 30 wild trout we made a second electrofishing pass to obtain a Chapman modified Petersen population estimate (Ricker 1975). At all other sites the number of wild trout captured was considered to be the total population present. Wild trout population abundance and biomass estimates for stream sections were derived by expanding the estimated number and weight of trout at a site to number and kilograms per hectare. State average weights were used. Angler expectation rankings for stream sections were calculated according to the procedures developed by Moase et al. (1993).

Results and Discussion

In general, the streams of the Nescopeck Creek basin possess low to moderate gradients (Tables 6 and 7) and can be characterized as geologically infertile. According to the criteria established by Johnson (1983), streams become vulnerable to acid precipitation when total alkalinity drops below 10 mg/l. This was the case at 26 of the 48 sites we examined in 1999, while total alkalinity was between 10 and 20 mg/l at 15 other sites (Tables 8 and 9).

Additionally, total alkalinity values in the Nescopeck Creek basin were probably somewhat inflated during our work because of the drought we experienced in the summer of 1999. Drought conditions can inflate alkalinity values because ground water makes up a greater percentage of stream flow during dry weather periods. Ground water is usually less acidic than rainwater.

We documented the presence of 20 fish species in the Nescopeck Creek basin during our 1999 surveys. Fish communities in the basin were generally composed of coldwater and transitional species. Brook trout were the most common fish we encountered, as they were present at 26 of the 32 sites we electrofished (Tables 10, 11, and 12). Blacknose dace were the second most common fish as they were present at 18 of the 32 sites. Warmwater species were rare and the few that we captured had probably escaped from local ponds.

Five of the 20 fish species we captured during our work were documented in the basin for the first time in 1999 while the other 15 species had been captured in previous surveys. The five new species we documented were golden shiners, fathead minnows, bluespotted sunfish, green sunfish, and American eels. The golden shiners and fathead minnows were probably the result of bait bucket introductions while the bluespotted and green sunfish had probably escaped from local ponds. The presence of an American eel in Unnamed Tributary 07, however, was quite surprising. This eel had to ascend several major dams and fishways on the Susquehanna River and then pass through 28.0 km of severely polluted acid mine drainage water in Nescopeck Creek. This was the first American eel captured in the Area 4 fisheries management region since 1983 and the only American eel we've ever captured in the Nescopeck Creek basin.

Historical surveys in the Nescopeck Creek basin had documented the presence of 17 fish species. We captured all of these species during our work with the exception of brown bullheads and bluegills. Both of these species are warmwater fishes that had probably escaped into the basin's streams from local ponds and so did not maintain instream populations.

Substantial wild brook trout populations were present in many of the smaller streams in the Nescopeck Creek basin while the larger streams were either polluted by acid mine drainage or warmed too much during the summer months to support wild trout. We documented 15 stream sections in the basin where brook trout numbers (Tables 13 and 14) and abundance (Tables 15 and 16) were sufficient to qualify for Class A status. Brown trout were relatively scarce because of the basin's acidic nature.

Water quality, fish species occurrence, and wild trout biomass varied among the basin streams. We will discuss specific findings for each stream and section individually, as the PFBC currently manages on a stream/section basis. This approach will facilitate

presenting the resource classifications (Tables 17 and 18) needed to generate management plans (Pennsylvania Fish and Boat Commission 1987).

Creasy Creek

Creasy Creek originates at approximately 457 m above mean sea level on SGL 119 and flows generally southwest for 7.4 km to its confluence with the upstream outlet of Lake Olympus. The confluence of Creasy Creek with the upstream outlet of Lake Olympus forms the headwaters of Nescopeck Creek. The Creasy Creek drainage contains two named tributaries (Mill Creek and Reilly Creek) and a single named reservoir (Bryants Pond). Land use is dominated by private forests and scattered rural residential development. A single NPDES discharge, operated by the Wilkes-Barre YMCA, enters Creasy Creek near its mouth. Access to Creasy Creek is fair as 36% of its length is within 300 m of a road.

We sampled at two stations (RM 3.38 and RM 1.41) on Creasy Creek and attempted to sample at a third but the stream was dry in its headwaters. Total alkalinity in Creasy Creek ranged from 12 to 24 mg/l and pH ranged from 6.9 to 7.2. Eight species of fish were present but gamefish populations were limited to brook trout and chain pickerel. We captured a total of 112 wild brook trout in 222 m of electrofishing at RM 3.38 and a total of 215 wild brook trout in 300 m of electrofishing at RM 1.41. We shortened our station at RM 3.38 to 222 m from 300 m because of a thunderstorm that struck the area while we were electrofishing.

Wild brook trout biomass throughout Section 01 of Creasy Creek was estimated at 38.95 kg/ha (Class A). Wild brook trout ranged from 25 to 224 mm but the angler expectation rating was poor. Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Creasy Creek. The DEP classification of CWF should be upgraded to HQ-CWF to provide appropriate water quality protection.

Mill Creek

Mill Creek is a 4.7 km long, low gradient tributary to Creasy Creek. Mill Creek originates at approximately 411 m above mean sea level just north of the Borough of White Haven. The stream flows generally north from its headwaters into a large unnamed pond. It emerges from this pond and flows into Bryants Pond, and then is fed by Reilly Creek before it empties into Creasy Creek. Land use in the drainage is dominated by private forests and scattered rural residential development. Access to the stream is good as 54% of its length is within 300 m of a road.

We did not sample Mill Creek because beaver dams impounded its lower end and the remainder of the stream flowed through private residential developments.

Reilly Creek

Reilly Creek is a 3.1 km long, moderate gradient tributary to Mill Creek. Reilly Creek originates at approximately 402 m above mean sea level and flows generally southwest. Land use in the drainage is dominated by private forests and scattered rural residential development. Access to the stream is fair as 40% of its length is within 300 m of a road.

We sampled at a single station on Reilly Creek. Total alkalinity at RM 0.06 was 22 mg/l and pH was 6.4. We did not electrofish in Reilly Creek because of low stream flow.

Nescopeck Creek

Nescopeck Creek is a 56.5 km long tributary to the North Branch of the Susquehanna River. Historic surveys documented that Nescopeck Creek was severely polluted by acid mine drainage from its confluence with Little Nescopeck Creek[B] downstream to the mouth, and our 1999 work showed that conditions in this area of stream have not improved. There are many sources of acid mine drainage to Nescopeck Creek but the foremost problem originates from the Jeddo Tunnel discharge. The DEP is currently involved in efforts to correct this problem.

We divided Nescopeck Creek into six sections for fisheries management purposes. These sections are described below.

Section 01

Section 01 of Nescopeck Creek extended 1.9 km from the headwaters downstream to the upstream boundary line of SGL 187. Access to the section was poor as only 22% of its length was within 300 m of a road. We did not sample in Section 01 because it was completely posted against public access and because of its short length.

Section 02

Section 02 of Nescopeck Creek extends 3.6 km from the upstream boundary line of SGL 187 downstream to the old bridge south of Lake Francis. Currently Section 02 is managed under Delayed Harvest Artificial Lures Only regulations. Access to the section is poor as no portion of its length is within 500 m of a road.

We sampled at a single station in Section 02. This was approximately the same station sampled by Daniels et al. (1979). Total alkalinity at RM 33.30 was 10 mg/l and pH was 6.8. These values were similar to those documented at the station by Daniels et al. in 1979.

Ten fish species were present in Section 02 but wild brook trout were the only gamefish we collected. We captured a total of 21 wild brook trout ranging from 50 to 199 mm in 300 m of electrofishing. Stocked trout were absent from our catch even though this area was managed under Delayed Harvest regulations. This was not unexpected, however, because of the habitat at our site. Several of the pools were too deep to electrofish and it was likely that more trout, including stocked fish, were present within the station than we were able to collect.

The fish community in Section 02 was similar to that documented in the section by Daniels et al. (1979). All of the species we captured in 1999 were present in 1979, while brown trout, brown bullhead, and largemouth bass were present historically but absent during our work.

Section 03

Section 03 of Nescopeck Creek extends 16.5 km from the old bridge south of Lake Francis downstream to the county road downstream from I 81. Currently Section 03 is managed as a stocked trout fishery under conventional, statewide angling regulations. Access to the section is good as 53% of its length is within 300 m of a road.

We sampled at three stations (RM 25.70, RM 23.41, and RM 21.44) in Section 03 and attempted to sample at a fourth, but the fourth site was too deep to work with backpack electrofishing gear. The three sites we sampled were approximately the same sites sampled by Daniels et al. (1979) and Copeland (1991a). Total alkalinity at our three sites ranged from 13 to 14 mg/l and pH ranged from 6.6 to 7.1. These values were similar to those documented in 1979 and 1991.

Thirteen fish species were present in Section 03. Brook trout, brown trout, chain pickerel, and largemouth bass made up the gamefish community. The only wild trout we captured, however, was a single brown trout at RM 23.41. This individual measured between 50 and 74 mm. Overall, Section 03 was best characterized as being in transition from a coldwater to a warmwater environment.

The fish community in Section 03 was similar to that documented by Daniels et al. (1979) and Copeland (1991a). Largemouth bass were recorded for the first time in 1999 while pumpkinseeds and bluegills were present historically but absent during our work.

Section 04

Section 04 of Nescopeck Creek extends 6.5 km from the first county road downstream from I 81 downstream to the confluence with Little Nescopeck Creek[B]. Although stocked with adult trout in the past, Section 04 is currently managed for its natural fish populations under conventional, statewide angling regulations. Stocking was

terminated because of landowner posting. Access to the section is very good as 83% of its length is within 300 m of a road.

We sampled at two stations (RM 19.90 and RM 17.46) in Section 04. Our station at RM 19.90 was approximately the same site sampled by Daniels et al. (1979) and Copeland (1991a), while our station at RM 17.46 was sampled for the first time in 1999. Total alkalinity at our sites ranged from 13 to 14 mg/l and pH ranged from 7.0 to 7.1. Water chemistry values at RM 19.90 in 1999 were similar to those documented at the site in 1979 and 1991.

We captured eleven fish species in Section 04 but brown trout were the only gamefish present. We captured a total of 3 wild brown trout in the section, all of which measured between 150 and 174 mm. Overall, Section 04 was best characterized as being in transition from a coldwater to a warmwater environment.

The fish community in Section 04 was similar to that documented by Daniels et al. (1979) and Copeland (1991a). Creek chubs were recorded for the first time in 1999 while brown bullheads and bluegills were present historically but absent during our work.

Section 05

Section 05 of Nescopeck Creek extended 14.2 km from the confluence with Little Nescopeck Creek[B] downstream to the confluence with Black Creek. Access to the section was very good as 77% of its length was within 300 m of a road.

We sampled at three stations (RM 14.55, RM 12.17, and RM 9.28) in Section 05. Our station at RM 12.17 was approximately the same site sampled by Daniels et al. (1979), while the other two stations were sampled for the first time in 1999. Total alkalinity at all three sites was 0 mg/l, total hardness was > 100 mg/l, pH was 4.7, and specific conductance ranged from 575 to 591 umhos. Water chemistry values at RM 12.17 were similar to those documented in 1979 with the exception of pH. Daniels et al. recorded a pH of 4.0 in this area.

We did not electrofish in Section 05 because water quality was toxic to fish life. Should the DEP be successful in correcting acid mine drainage problems in the basin there would be tremendous potential to provide a sport fishery in this area of stream. Physical habitat throughout the section was excellent.

Section 06

Section 06 of Nescopeck Creek extended 13.8 km from the confluence with Black Creek downstream to the mouth. Access to the section was very good as 79% of its length was within 300 m of a road.

We sampled at three stations (RM 7.27, RM 4.88, and RM 1.14) in Section 06. Total alkalinity at all three stations was 0 mg/l, total hardness was > 100 mg/l, pH ranged from 4.7 to 4.8, and specific conductance ranged from 481 to 505 umhos. We did not electrofish in Section 06 because water quality was toxic to fish life. As was the case in Section 05, Section 06 had tremendous potential to provide a sport fishery should the DEP be successful in correcting water quality problems.

Little Nescopeck Creek[A] (410521 755100)

Little Nescopeck Creek[A] is an 11.0 km long, moderate gradient tributary to Nescopeck Creek. Little Nescopeck Creek[A] originates at approximately 549 m above mean sea level on SGL 119 and flows generally south to its confluence with Nescopeck Creek near Lake Olympus. There is one named tributary (Conety Run) and one named reservoir (Fountain Lake) in the Little Nescopeck Creek[A] drainage. Land use in the drainage is dominated by SGL 119 but some fairly substantial residential development has occurred recently where the stream flows out of the game lands near its confluence with Conety Run. We divided Little Nescopeck Creek[A] into two sections for fisheries management purposes.

Section 01

Section 01 of Little Nescopeck Creek[A] extended 5.4 km from the headwaters downstream to the first unnamed tributary downstream from Tunnel. Access to the section was good as 52% of its length was within 300 m of a road.

We sampled at a single station in Section 01 and attempted to sample at a second, but the stream was dry in its headwaters. Total alkalinity at RM 3.67 was 2 mg/l and pH was 5.8. Brook trout and chain pickerel were the only fish species present at the station. We captured a total of 2 wild brook trout ranging from 100 to 149 mm in 90 m of electrofishing. Wild brook trout populations in Section 01 were limited by acidic water quality and seasonally low flows. There was little water at RM 3.67 during our survey and the pools were nearly stagnant.

Section 02

Section 02 of Little Nescopeck Creek[A] extended 5.6 km from the first unnamed tributary downstream from Tunnel downstream to the mouth. Access to the section was fair as 35% of its length was within 300 m of a road.

We sampled at a single station in Section 02. Total alkalinity at RM 1.67 was 5 mg/l and pH was 7.0. Brook trout and chain pickerel were the only fish species present at the station. We captured a total of 353 wild brook trout in 324 m of electrofishing. Wild

brook trout biomass was estimated at 38.89 kg/ha (Class A) with fish ranging from 25 to 274 mm. The angler expectation rating was good. Wild brook trout populations in Section 02 were much more dense than in Section 01 because stream flow was much greater. This was due to the contribution of flow from the first unnamed tributary downstream from Tunnel, which possessed a fairly large drainage area.

Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Section 02 of Little Nescopeck Creek[A]. The DEP classification of CWF, however, did not provide sufficient water quality protection. The entire Little Nescopeck Creek[A] drainage should be upgraded to HQ-CWF to protect the Class A wild trout population in Section 02.

Conety Run

Conety Run is a 4.3 km long, high gradient tributary to Little Nescopeck Creek[A]. Conety Run originates at the outlet of Fountain Lake and flows generally south. Land use in the drainage is dominated by SGL 119. Access to the stream is fair as 43% of its length is within 300 m of a road.

We sampled at a single station on Conety Run. Total alkalinity at RM 0.78 was 2 mg/l and pH was 6.2. Brook trout and pumpkinseed were the only fish species present at the station. We captured a total of 203 wild brook trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 34.73 kg/ha (Class A) with fish ranging from 50 to 199 mm. The angler expectation rating was good.

Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Conety Run. The DEP classification of CWF, however, did not provide sufficient water quality protection. Conety Run should be upgraded to HQ-CWF because it supported a Class A wild trout population.

Long Hollow

Long Hollow originates at approximately 579 m above mean sea level at the top of Mount Yeager and flows generally southwest to its confluence with an unnamed tributary. The confluence of Long Hollow with the unnamed tributary forms the headwaters of Oley Creek. In past PFBC narratives Long Hollow has been erroneously considered to be Section 01 of Oley Creek. Private forests and SGL 187 dominate land use in the Long Hollow drainage. Access to the stream is poor as no portion of its length is within 500 m of a public road.

We sampled at a single station on Long Hollow. This station was located in a different area than that sampled by Daniels et al. (1976) so we will not attempt to make comparisons to the earlier work. Total alkalinity at RM 0.21 was 14 mg/l and pH was 6.4. Brook trout, brown trout, and sculpins were the only fish species present

at the station. We captured a total of 331 wild brook trout and 3 wild brown trout in 328 m of electrofishing. Wild brook trout biomass was estimated at 76.71 kg/ha (Class A) with fish ranging from 25 to 199 mm. The angler expectation rating was poor.

Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Long Hollow. The DEP classification of HQ-CWF provided appropriate water quality protection.

Oley Creek

Oley Creek is a 6.9 km long tributary to Nescopeck Creek. Oley Creek originates at the confluence of Long Hollow with an unnamed tributary. Land use in the Oley Creek drainage is a mixture of private forests, SGL 187, and substantial residential development centered around Beech Lake, which impounds Oley Creek near its mouth. Additionally, some strip mining is present downstream from Beech Lake and in the drainage of the second unnamed tributary upstream from Beech Lake. We divided Oley Creek into two sections for fisheries management purposes.

Section 01

Section 01 of Oley Creek extended 3.7 km from the headwaters downstream to the I-80 crossing at mile marker 265. Access to the section was poor as no portion of its length was within 500 m of a road. We sampled at a single station in Section 01 that was approximately the same station sampled by Daniels et al. (1976) and Copeland (1991b). Total alkalinity at RM 3.91 was 6 mg/l and pH was 6.4. These values were similar to those documented at the station in 1976.

Brook trout, brown trout, blacknose dace, and sculpins were the only fish species present at RM 3.91. We captured a total of 331 wild brook trout and 25 wild brown trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 65.00 kg/ha (Class A) and wild brown trout biomass was estimated at 16.34 kg/ha. The total wild trout biomass was 81.34 kg/ha. Wild brook trout ranged from 25 to 249 mm and wild brown trout ranged from 25 to 299 mm. The angler expectation rating was poor.

Fish community composition in Section 01 of Oley Creek during the 1999 survey was identical to that documented by Daniels et al. (1976) and Copeland (1991b). Wild trout biomass at RM 3.91, however, was much higher in 1999. Daniels et al. (1976) documented a total wild trout biomass of 15.90 kg/ha and Copeland (1991b) documented a total wild trout biomass of 31.46 kg/ha. Copeland (1991b) noted that wild trout biomass in Section 01 of Oley Creek increased between 1976 and 1991 due to the termination of trout stocking. The biomass increase we documented between 1991 and 1999, however, was partially due to the drought that we experienced this

summer and the corresponding decrease in station width. The mean width of our station at RM 3.91 was 5.1 m in 1976, 5.6 m in 1991, and 2.7 m in 1999. When we calculated all three biomass estimates using a standard width of 4.5 m we found that total wild trout biomass at RM 3.91 was 18.16 kg/ha in 1976, 38.18 kg/ha in 1991, and 46.46 kg/ha in 1999.

Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Oley Creek. The DEP classification of HQ-CWF should be extended downstream to the I-80 crossing at mile marker 265 to provide appropriate water quality protection.

Section 02

Section 02 of Oley Creek extended 3.2 km from the I-80 bridge at mile marker 265 downstream to the mouth. We did not sample in Section 02 because this section was completely closed to public access. Additionally, no historical sampling has been conducted in this section for the same reason.

Long Run

Long Run is a 4.4 km long, moderate gradient tributary to Nescopeck Creek. Long Run originates at approximately 396 m above mean sea level on the lower slopes of Nescopeck Mountain and flows generally south. Land use in the drainage is a mixture of private forests, agricultural areas, and residential development. Additionally, there are a number of unnamed ponds in the drainage. Access to the stream is fair as 47% of its length is within 300 m of a road.

We sampled at a single station on Long Run. Total alkalinity at RM 1.33 was 4 mg/l and pH was 6.6. Brook trout, blacknose dace, and creek chubs were the only fish species present at the station. We captured a total of 239 wild brook trout in 300 m of electrofishing. Brook trout biomass was estimated at 31.23 kg/ha (Class A) with fish ranging from 25 to 174 mm. The angler expectation rating was poor.

Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Long Run. The DEP classification of CWF, however, did not provide sufficient water quality protection. Long Run should be upgraded to HQ-CWF because it supported a Class A wild trout population.

Little Nescopeck Creek[B] (410033 760432)

Little Nescopeck Creek[B] is a 12.4 km long, low gradient tributary to Nescopeck Creek. Little Nescopeck Creek[B] originates at the confluence of two unnamed tributaries in a narrow valley between Buck Mountain to the south and Green Mountain to the north. Little Nescopeck Creek[B] flows generally west through a mixture of

agricultural and suburban areas. There has been little mining in the watershed but the stream receives acid mine drainage from the Jeddo Tunnel. The Jeddo Tunnel discharges to Little Nescopeck Creek[B] near the village of Kis-Lyn in the headwaters. Kupsky (1999) reported a pH of 4.4 and total acidity of 64.0 mg/l in the tunnel discharge. Total copper, iron, lead, zinc, and aluminum concentrations all exceeded criteria established for the protection of aquatic life. In addition to the Jeddo Tunnel discharge, Little Nescopeck Creek[B] must also assimilate wastewater from the Butler Township Municipal Authority sewage treatment plant. This plant discharges to Little Nescopeck Creek[B] south of Drums.

We sampled at four stations on Little Nescopeck Creek[B]. Water chemistry values at RM 7.32, located upstream from the Jeddo Tunnel discharge, indicated a surprisingly fertile system. Total alkalinity was 66 mg/l and pH was 7.1. We did not electrofish at RM 7.32 because of low stream flows but Kupsky (1999) reported the presence of eight fish species, including wild brook trout, in this area.

The remaining three stations we sampled on Little Nescopeck Creek[B] were located downstream from the Jeddo Tunnel discharge. Total alkalinity at all three stations was 0 mg/l, pH was 4.7, total hardness was greater than 100 mg/l, and specific conductance ranged from 841 to 878 umhos. We did not electrofish at these three stations because water quality was toxic to fish life. Little Nescopeck Creek[B] will not support a fishery until the water quality problems that originate from the Jeddo Tunnel mine discharge are corrected.

Black Creek

Black Creek is a 34.9 km long tributary to Nescopeck Creek. Black Creek originates in an active strip mine south of the village of Jeddo and flows generally west to the village of Gowen. At Gowen the stream bends and flows generally north to its confluence with Nescopeck Creek southeast of Berwick. There are two named tributaries (Cranberry and Stony Creeks) and one named reservoir (Humboldt Reservoir) in the Black Creek drainage. Land use in the drainage is a mixture of agricultural, urban, forested, and mined areas. The city of Hazleton is the largest urban center in the watershed.

Black Creek receives acid mine drainage from two major point sources, several minor point sources, and numerous non-point sources. The two major point sources of acid mine drainage are the Gowen and Derringer Tunnels, both of which are located near Gowen. Wood (1996) reported a pH of 3.8 from the Gowen discharge and 3.6 from the Derringer discharge. In addition to acid mine drainage, Black Creek must assimilate wastewater from the Eckley Miners Village, the Hazleton Area School District, and the greater Hazleton Joint Authority. The greater Hazleton Joint Authority is

by far the largest of these sewage treatment plants. It discharges to Black Creek south of the State Route 93 bridge.

We divided Black Creek into three sections for Fisheries Management purposes.

Section 01

Section 01 of Black Creek extended 7.3 km from the headwaters downstream to State Route 309. Access to the section was fair as 28% of its length was within 300 m of a road.

We attempted to sample at two stations in Section 01 but this area of the stream was completely dry when we examined it on September 1, 1999. Kupsky (1999) reported that a small amount of stormwater flow was present at State Route 309 during his survey. Nevertheless, he noted that the mapped headwaters of Black Creek no longer existed because strip mining activities had destroyed all natural contours.

Section 02

Section 02 of Black Creek extended 15.4 km from State Route 309 downstream to State Route 3020. Access to the section was generally difficult even though 66% of its length was within 300 m of a road. The road that paralleled much of Section 02 was in poor condition and, as a result, we only sampled at two stations (RM 15.36 and RM 11.72) in this section. Total alkalinity at both stations was 12 mg/l and pH ranged from 6.2 to 6.6. Kupsky (1999) reported that Section 02 suffered from non-point source acid mine drainage that was partially offset by the addition of significant alkalinity from the greater Hazleton Joint Authority sewage treatment plant discharge.

Electrofishing efforts at RM 15.36 documented six fish species but gamefish were absent. The fish community here was best described as transitional between a coldwater and a warmwater environment. We did not attempt to electrofish at RM 11.72 even though water chemistry values indicated that fish might be present. Our site at RM 11.72 was located downstream from the Greater Hazleton Joint Authority sewage treatment plant discharge and thunderstorms had passed through the area the previous day. As Kupsky (1999) predicted, runoff from the thunderstorms into the sewage treatment system had caused excessive organic solids loading in the stream. In fact, conditions were so foul that we were unable to collect width data at this site for fear of coming into contact with the water/sewage mixture. To add insult to injury, the road leading into our site at RM 11.72 was exceedingly littered with old appliances and household trash. Overall, Section 02 of Black Creek was a disgrace. It was difficult to believe that this type of situation could exist in Pennsylvania in 1999.

Section 03

Section 03 of Black Creek extended 12.2 km from State Route 3020 downstream to the mouth. Access to the section was very good as 87% of its length was within 300 m of a road.

We sampled at three stations (RM 7.35, RM 3.11, and RM 0.00) in Section 03. Total alkalinity at our stations ranged from 0 mg/l to a trace, total hardness ranged from 24 to > 100 mg/l, specific conductance ranged from 209 to 261 umhos, and pH ranged from 4.6 to 6.0. These acidic conditions precluded the development of a viable fishery. Electrofishing at RM 7.35 (pH 6.0 and a trace of alkalinity) did not capture any fish, and we did not electrofish at the other two stations because water quality was toxic to fish life.

Acid mine drainage problems in Section 03 of Black Creek primarily originated from the two tunnel discharges near Gowen. These discharges would have to be remedied before any biological recovery could take place in the stream. Additionally, the excessive organic solids loading described in Section 02 continued into Section 03. A noticeable sewage odor was present throughout the section during our work and while measuring our station at RM 3.11 the stream began to rise from a thunderstorm we had experienced earlier in the day. As it rose the stream turned black with sewage and large amounts of litter floated downstream. Kupsky (1999) was unable to determine the effects of the combined sewer overflows on Black Creek because of the overwhelming acid mine drainage problems. Nevertheless it was obvious that the massive sewage overflow problems we observed would hinder efforts to restore a fishery even if the acid mine drainage problems were corrected.

Cranberry Creek

Cranberry Creek is a 5.1 km long, moderate gradient tributary to Black Creek. Cranberry Creek originates in a strip mine just south of the city of Hazleton and flows through a series of mined and urbanized areas. Stony Creek is the only named tributary in the Cranberry Creek drainage. Access to the stream is fair as 40% of its length is within 300 m of a road.

We attempted to sample Cranberry Creek near its confluence with Stony Creek but the stream was dry in this area. Nasilowski (1996) reported that Cranberry Creek sinks into a mine pit downstream from State Route 924.

Stony Creek

Stony Creek is a 3.9 km long, moderate gradient tributary to Cranberry Creek. Stony Creek originates at the confluence of two unnamed tributaries on Little Sugarloaf Mountain near Humboldt Reservoir and flows generally northeast. Land use in the drainage

is a mixture of private forests and mined lands. Access to the stream is poor as no portion of its length is within 500 m of a road.

We sampled at a single station on Stony Creek that was located upstream from a strip mined area on the north bank but downstream from a reported source of acid mine drainage entering from the south bank. Total alkalinity at RM 0.26 was 2 mg/l, total hardness was > 100 mg/l, pH was 5.3, and specific conductance was 27 umhos. These acidic conditions precluded the development of a viable fishery. We captured only two wild brook trout ranging from 150 to 199 mm in 150 m of electrofishing. It was possible, however, that a more substantial brook trout population was present in Stony Creek near Humboldt Reservoir. We attempted to sample in this area but were unable to gain access to it.

Unnamed Tributaries

We sampled 19 unnamed tributaries in the Nescopeck Creek basin. For the most part these tributaries were infertile and supported few fish species. Brook trout were present in all of the unnamed tributaries we electrofished and most of these streams possessed a surprising amount of flow considering their short lengths and the 1999 drought. As mentioned previously, we distinguished these tributaries by numbering them starting at the mouth of Nescopeck Creek. We will describe these tributaries individually below.

Unnamed Tributary 01 (410140 761252)

Unnamed Tributary 01 is a 4.1 km long, moderate gradient tributary to Nescopeck Creek at RM 2.47. Unnamed Tributary 01 originates from an unnamed pond in Mifflin Township, Columbia County, and flows generally east. Land use in the drainage is generally agricultural but the stream is bordered by a greenbelt of trees.

We sampled at a single station on Unnamed Tributary 01. Total alkalinity at RM 1.52 was 24 mg/l and pH was 7.1. We did not electrofish in Unnamed Tributary 01 because stream flow was very low.

Unnamed Tributary 02 (410206 761131)

Unnamed Tributary 02 is a 4.1 km long, moderate gradient tributary to Nescopeck Creek at RM 4.84. Unnamed Tributary 02 originates north of State Route 93 near Mount Zion Church and flows generally southwest. Land use in the drainage is a mixture of agriculture and woodlots.

We sampled at a single station on Unnamed Tributary 02. Total alkalinity at RM 1.08 was 22 mg/l and pH was 7.3. Brook trout, blacknose dace, and creek chubs were the only fish species present

at the station. We captured two wild brook trout ranging from 225 to 274 mm in 300 m of electrofishing. Unnamed Tributary 02 at RM 1.08 appeared to have suffered from a recent flash flood, possibly leading to the low wild trout biomass we observed. Water temperature at RM 1.08 was cold and flows were adequate to support a much more dense wild trout population. If this is the case the stream's brook trout population should rebound relatively quickly.

Unnamed Tributary 03 (410134 761027)

Unnamed Tributary 03 is a 3.2 km long, moderate gradient tributary to Nescopeck Creek at RM 7.27. Unnamed Tributary 03 originates south of State Route 93 near Briggsville and flows generally southwest. Land use in the drainage is a mixture of agriculture and woodlots.

We sampled at a single station on Unnamed Tributary 03. Total alkalinity at RM 0.34 was 18 mg/l and pH was 7.1. Brook trout, blacknose dace, largemouth bass, and sculpins were the only fish species present at the station. We captured a total of 47 wild brook trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 16.05 kg/ha (Class C) with fish ranging from 50 to 224 mm. The angler expectation rating was poor. As was the case with Unnamed Tributary 02, Unnamed Tributary 03 appeared to have suffered from a recent flash flood. Wild brook trout biomass in Unnamed Tributary 03 was much lower than expected considering the excellent physical habitat at the site.

Unnamed Tributary 04 (410018 760630)

Unnamed Tributary 04 is a 1.8 km long, high gradient tributary to Nescopeck Creek at RM 13.98. Unnamed Tributary 04 originates on the southern slopes of Nescopeck Mountain south of I 80 and flows generally south. Land use in the drainage is a mixture of agriculture and woodlots.

We sampled at a single station on Unnamed Tributary 04. Total alkalinity at RM 0.15 was 24 mg/l and pH was 7.2. Brook trout and blacknose dace were the only fish species present at the station. We captured a total of 76 wild brook trout in 120 m of electrofishing. We were able to electrofish for no more than 120 m because of the brushy nature of the stream but this was sufficient to obtain a biomass estimate. Wild brook trout biomass was estimated at 58.57 kg/ha (Class A) with fish ranging from 50 to 174 mm. The angler expectation rating was poor.

Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Unnamed Tributary 04. The DEP classification of CWF, however, did not provide sufficient water quality protection. Unnamed Tributary 04 should be upgraded to HQ-CWF because it supported a Class A wild trout population.

Unnamed Tributary 05 (410040 760602)

Unnamed Tributary 05 is a 1.8 km long, high gradient tributary to Nescopeck Creek at RM 14.93. Unnamed Tributary 05 originates on the southern slopes of Nescopeck Mountain west of interchange 38 on I 80 and flows generally south. Land use in the drainage is dominated by woodlots but some agriculture is present.

We sampled at a single station on Unnamed Tributary 05. Total alkalinity at RM 0.38 was 18 mg/l and pH was 7.1. Brook trout and sculpins were the only fish species present at the station. We captured a total of 239 wild brook trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 59.73 kg/ha (Class A) with fish ranging from 50 to 224 mm. The angler expectation rating was poor.

Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Unnamed Tributary 05. The DEP classification of CWF, however, did not provide sufficient water quality protection. Unnamed Tributary 05 should be upgraded to HQ-CWF because it supported a Class A wild brook trout population.

Unnamed Tributary 06 (410055 760450)

Unnamed Tributary 06 is a 1.8 km long, high gradient tributary to Nescopeck Creek at RM 17.17. Unnamed Tributary 06 originates on the southern slopes of Nescopeck Mountain east of interchange 38 on I 80 and flows generally south. Land use in the drainage is a mixture of agriculture, woodlots, and suburban development. Unnamed Tributary 06 receives wastewater from two small NPDES permitted discharges near its headwaters. These discharges are licensed to Days Inn and the Pilot Corporation.

We sampled at a single station on Unnamed Tributary 06. Total alkalinity at RM 0.32 was 24 mg/l and pH was 6.7. Brook trout and blacknose dace were the only fish species present at the station. We were unable to obtain an estimate of the brook trout population in this stream because it was too brushy to electrofish for any length. The cursory electrofishing we were able to accomplish, however, demonstrated that brook trout were abundant.

Unnamed Tributary 07 (410051 760321)

Unnamed Tributary 07 is a 3.6 km long, moderate gradient tributary to Nescopeck Creek at RM 18.86. Unnamed Tributary 07 originates on the southern slopes of Nescopeck Mountain south of I 80 and flows generally southwest. Land use in the drainage is a mixture of agriculture and woodlots.

We sampled at a single station on Unnamed Tributary 07. Total alkalinity at RM 0.95 was 12 mg/l and pH was 6.9. Ten fish species were present at the station and the fish community included a single American eel. Brook trout was the only gamefish species present. We captured a total of 216 wild brook trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 45.62 kg/ha (Class A) with fish ranging from 25 to 249 mm. The angler expectation rating was excellent.

Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Unnamed Tributary 07. The DEP classification of CWF, however, did not provide sufficient water quality protection. Unnamed Tributary 07 should be upgraded to HQ-CWF because it supported a Class A wild trout population.

Unnamed Tributary 08 (410117 760209)

Unnamed Tributary 08 is a 1.5 km long, low gradient tributary to Nescopeck Creek at RM 19.89. Unnamed Tributary 08 originates on the southern slopes of Nescopeck Mountain south of I 80 and flows generally south. Land use in the drainage is generally agricultural and there are numerous small ponds on and next to the stream.

We sampled at a single station on Unnamed Tributary 08. Total alkalinity at RM 0.53 was 20 mg/l and pH was 6.8. We did not electrofish in Unnamed Tributary 08 because it was too brushy and because there was a private hatchery located on the stream near the headwaters. It was likely that this stream supported wild brook trout because the water temperature was cold and it possessed sufficient flow.

Unnamed Tributary 09 (410108 760143)

Unnamed Tributary 09 is a 2.8 km long, moderate gradient tributary to Nescopeck Creek at RM 20.46. Unnamed Tributary 09 originates south of the junction of I 80 and I 81 and flows generally south. Land use in the drainage is dominated by agriculture but the stream is surrounded by a greenbelt of trees.

We sampled at a single station on Unnamed Tributary 09. Total alkalinity at RM 1.33 was 14 mg/l and pH was 6.9. Brook trout and sculpins were the only fish species present at the station. We were unable to obtain an estimate of the brook trout population in this stream because it was too brushy to electrofish for any length. The cursory electrofishing we were able to accomplish, however, demonstrated that brook trout were abundant.

Unnamed Tributary 10 (410212 755752)

Unnamed Tributary 10 is a 3.4 km long, moderate gradient tributary to Nescopeck Creek at RM 23.95. Unnamed Tributary 10 originates

near Sand Spring and flows generally south. Land use in the drainage is a mixture of private forests in the upper portions and agriculture in the lower portions. Unnamed Tributary 10 was completely dry when we surveyed it on August 26, 1999.

Unnamed Tributary 11 (410257 755626)

Unnamed Tributary 11 is a 1.9 km long, low gradient tributary to Nescopeck Creek at RM 26.61. Unnamed Tributary 11 originates at the confluence of two unnamed tributaries just north of I 80 and flows generally south until it is impounded by an unnamed dam near its mouth. Private forests dominate land use in the drainage although its upstream portion is contained within SGL 187.

We sampled at a single station on Unnamed Tributary 11. Total alkalinity at RM 0.95 was 5 mg/l and pH was 6.7. Brook trout and sculpins were the only fish species present at the station. We captured a total of 502 wild brook trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 129.46 kg/ha (Class A) with fish ranging from 25 to 274 mm. The angler expectation rating was excellent.

Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Unnamed Tributary 11. The DEP classification of HQ-CWF provided appropriate water quality protection.

Unnamed Tributary 12 (410347 755538)

Unnamed Tributary 12 is a 1.6 km long, high gradient tributary to Nescopeck Creek at RM 27.18. Unnamed Tributary 12 originates on the southern slopes of Nescopeck Mountain and flows generally south. Forested lands, including portions of SGL 187 and Nescopeck State Park, dominate land use in the drainage.

We sampled at a single station on Unnamed Tributary 12. Total alkalinity at RM 0.19 was 6 mg/l and pH was 6.6. Brook trout, blacknose dace, creek chub, and tessellated darter were the only fish species present at the station. We captured a total of 148 wild brook trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 40.67 kg/ha (Class A) with fish ranging from 50 to 199 mm. The angler expectation rating was poor.

Statewide angling regulations were adequate to protect and manage the fishery in Unnamed Tributary 12. The DEP classification of HQ-CWF provided appropriate water quality protection.

Unnamed Tributary 13 (410415 755452)

Unnamed Tributary 13 is a 3.1 km long, high gradient tributary to Nescopeck Creek at RM 28.51. Unnamed Tributary 13 originates at the outlet of Mountain Pond and flows generally south. The drainage is

almost entirely forested and includes portions of SGL 187 and Nescopeck State Park.

We sampled at a single station on Unnamed Tributary 13. Total alkalinity at RM 0.55 was 1 mg/l and pH was 5.8. Brook trout was the only fish species present in Unnamed Tributary 13. We captured 2 brook trout ranging from 50 to 99 mm in 60 m of electrofishing.

Unnamed Tributary 14 (410458 755348)

Unnamed Tributary 14 is a 2.5 km long, high gradient tributary to Unnamed Tributary 15 at RM 0.25. Unnamed Tributary 14 originates on top of Nescopeck Mountain and flows generally southeast. The drainage is almost entirely forested and is wholly contained within SGL 187 and Nescopeck State Park. Unnamed Tributary 14 was completely dry when we examined it on July 14, 1999.

Unnamed Tributary 15 (410452 755334)

Unnamed Tributary 15 is a 3.1 km long, high gradient tributary to Unnamed Tributary 18 at RM 0.37. Unnamed Tributary 15 originates on top of Nescopeck Mountain and flows generally southwest. The drainage is almost entirely forested and is wholly contained within SGL 187 and Nescopeck State Park.

We sampled at a single station on Unnamed Tributary 15. Total alkalinity at RM 0.13 was 2 mg/l and pH was 6.0. Brook and brown trout were the only fish species present at the station. We captured a total of 120 wild brook trout and 1 wild brown trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 58.64 kg/ha (Class A) with fish ranging from 25 to 199 mm. The angler expectation rating was poor.

Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Unnamed Tributary 15. The DEP classification of HQ-CWF provided appropriate water quality protection.

Unnamed Tributary 16 (410534 755245)

Unnamed Tributary 16 is a 2.3 km long, high gradient tributary to Unnamed Tributary 17 at RM 1.14. Unnamed Tributary 16 originates near the top of Nescopeck Mountain and flows generally south. The drainage is almost entirely forested and is wholly contained within SGL 187 and Nescopeck State Park.

We sampled at a single station on Unnamed Tributary 16. Total alkalinity at RM 0.11 was 1 mg/l and pH was 5.5. Brook trout was the only fish species present at the station. We captured a total of 5 wild brook trout ranging from 100 to 174 mm in 30 m of electrofishing.

Unnamed Tributary 17 (410452 755335)

Unnamed Tributary 17 is a 4.9 km long, high gradient tributary to Unnamed Tributary 18. Unnamed Tributary 17 originates near the top of Nescopeck Mountain south of Rita and flows generally south into an unnamed pond. It emerges from this pond, flows into Lake Francis, and then flows generally southwest to its mouth. The drainage is almost entirely forested and is wholly contained within SGL 187 and Nescopeck State Park.

We sampled at a single station on Unnamed Tributary 17. Total alkalinity at RM 1.52 was 5 mg/l and pH was 6.9. Brook trout was the only fish species present at the station. We captured a total of 219 wild brook trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 48.90 kg/ha (Class A) with fish ranging from 25 to 199 mm. The angler expectation rating was poor.

Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Unnamed Tributary 17. The DEP classification of HQ-CWF provided appropriate water quality protection.

Unnamed Tributary 18 (410437 755337)

Unnamed Tributary 18 is a 0.6 km long, low gradient tributary to Nescopeck Creek at RM 30.22. Unnamed Tributary 18 originates at the confluence of Unnamed Tributaries 15 and 17 and flows generally south. The drainage is entirely forested and is wholly contained within Nescopeck State Park.

We sampled at a single station on Unnamed Tributary 18. Total alkalinity at RM 0.00 was 5 mg/l and pH was 6.2. Nine fish species were present at the station but brook trout was the only gamefish collected. We captured a total of 15 wild brook trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 1.43 kg/ha (Class D) with fish ranging from 50 to 149 mm. The angler expectation rating was poor.

Statewide angling regulations under the natural yield option were adequate to protect and manage the fishery in Unnamed Tributary 18. The DEP classification of HQ-CWF provided sufficient water quality protection.

Unnamed Tributary 19 (410526 755203)

Unnamed Tributary 19 is a 4.6 km long, high gradient tributary to Nescopeck Creek at RM 33.72. Unnamed Tributary 19 originates north of State Route 437 and flows generally south. The drainage is almost entirely forested and is primarily contained within SGL 187, SGL 119, and Nescopeck State Park.

We sampled at a single station on Unnamed Tributary 19. Total alkalinity at RM 0.76 was 2 mg/l and pH was 6.1. Brook trout was the only fish species present at the station. We captured a total of 304 wild brook trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 65.26 kg/ha (Class A) with fish ranging from 25 to 199 mm. The angler expectation rating was poor.

Statewide angling regulations under the wild trout waters option were adequate to protect and manage the fishery in Unnamed Tributary 19. The DEP classification of HQ-CWF provided appropriate water quality protection.

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MANAGEMENT RECOMMENDATIONS

1) The Pennsylvania Fish and Boat Commission should manage the following streams with statewide angling regulations under the wild trout waters option:

Creasy Creek
Little Nescopeck Creek[A] (Section 02)
Conety Run
Long Hollow
Oley Creek (Section 01)
Long Run
Unnamed Tributary 04
Unnamed Tributary 05
Unnamed Tributary 07
Unnamed Tributary 11
Unnamed Tributary 12
Unnamed Tributary 15
Unnamed Tributary 16
Unnamed Tributary 17
Unnamed Tributary 19

All of these streams supported Class A wild trout populations.

2) The Pennsylvania Fish and Boat Commission should manage the following streams with statewide angling regulations under the natural yield option:

Reilly Creek
Little Nescopeck Creek[A] (Section 01)
Stony Creek
Black Creek (Section 01)
Cranberry Creek
Unnamed Tributary 01
Unnamed Tributary 02
Unnamed Tributary 03
Unnamed Tributary 06
Unnamed Tributary 08
Unnamed Tributary 09
Unnamed Tributary 10
Unnamed Tributary 13
Unnamed Tributary 14
Unnamed Tributary 18

For a variety of reasons these streams did not support Class A wild trout populations and were unsuitable for the statewide adult trout stocking program.

3) The Pennsylvania Fish and Boat Commission should continue to manage Mill Creek, Nescopeck Creek (Section 01), Nescopeck Creek (Section 04), and Oley Creek (Section 02) for their natural fish populations under statewide angling regulations. These stream sections were closed to public access.

4) The Pennsylvania Fish and Boat Commission should continue to stock adult trout in Sections 02 and 03 of Nescopeck Creek. Section 02 should continue to be managed with delayed harvest artificial lures only regulations and Section 03 should continue to be managed with statewide angling regulations.

5) The Pennsylvania Fish and Boat Commission should not actively manage Nescopeck Creek (Section 05), Nescopeck Creek (Section 06), Black Creek (Section 02), Black Creek (Section 03), and Little Nescopeck Creek[B]. Water quality problems in these stream sections currently prohibit the development of recreational fisheries.

6) The Pennsylvania Department of Environmental Protection should upgrade the Chapter 93 water quality classifications of the following streams from coldwater fishery to high quality coldwater fishery:

Creasy Creek	Long Run
Little Nescopeck Creek[A] Section 01	Unnamed Tributary 04
Little Nescopeck Creek[A] Section 02	Unnamed Tributary 05
Conety Run	Unnamed Tributary 07

7) The Pennsylvania Department of Environmental Protection should continue its efforts to abate acid mine drainage problems in the Nescopeck Creek basin. The lower reaches of Nescopeck Creek, in particular, have tremendous potential to provide a recreational fishery if the water quality problems can be corrected.

8) The Pennsylvania Department of Environmental Protection should work with the Greater Hazleton Joint Sewer Authority to correct this plant's combined sewer overflow problems. The situation we observed in Black Creek following several thunderstorms this summer should not be tolerated.

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Table 1. Named streams of the Nescopeck Creek basin (405D) listed in hierarchical order.

Creasy Creek
Mill Creek
Reilly Creek
Nescopeck Creek Section 01
Little Nescopeck Creek[A] Section 01
Little Nescopeck Creek[A] Section 02
Conety Run
Nescopeck Creek Section 02
Nescopeck Creek Section 03
Long Hollow
Oley Creek Section 01
Oley Creek Section 02
Long Run
Nescopeck Creek Section 04
Nescopeck Creek Section 05
Little Nescopeck Creek[B]
Nescopeck Creek Section 06
Black Creek Section 01
Black Creek Section 02
Cranberry Creek
Stony Creek
Black Creek Section 03

Little Nescopeck Creek[A]: Tributary to Nescopeck Creek at River Mile 36.58.

Little Nescopeck Creek[B]: Tributary to Nescopeck Creek at River Mile 17.40.

Table 2. Section limits for streams in the Nescopeck Creek basin (405D).

Stream (Section Number)	Upstream Limit	Downstream Limit
Nescopeck Creek (01)	Headwaters	Upstream SGL 187 Boundary
Nescopeck Creek (02)	Upstream SGL 187 Boundary	Old Bdg S of Lk Francis
Nescopeck Creek (03)	Old Bdg S of Lk Francis	County Rd downstream of I 81
Nescopeck Creek (04)	County Rd downstream of I 81	Little Nescopeck Creek[B]
Nescopeck Creek (05)	Little Nescopeck Creek[B]	Black Creek
Nescopeck Creek (06)	Black Creek	Mouth
Little Nescopeck Creek[A] (01)	Headwaters	First UNT downstream Tunnel
Little Nescopeck Creek[A] (02)	First UNT downstream Tunnel	Mouth
Oley Creek (01)	Headwaters	I 80 Mile Marker 265
Oley Creek (02)	I 80 Mile Marker 265	Mouth
Black Creek (01)	Headwaters	SR 309
Black Creek (02)	SR 309	SR 3020
Black Creek (03)	SR 3020	Mouth

All other streams in the Nescopeck Creek basin are managed as a single section extending from the headwaters downstream to the mouth.

Table 3. Station number, river mile, downstream limit, length electrofished, and voltage for stations sampled on named streams during 1999 in the Nescopeck Creek basin (405D).

Stream	Station Number	River Mile	Downstream Limit	Length (m)	Volts
Creasy Creek	0102	3.38	County Road	222	300 DC
	0103	1.41	150 m downstream from SR 437	300	150 AC
Reilly Creek	0101	0.06	SR 437	NA	NA
Nescopeck Creek	0201	33.30	DH Area downstream from UNT 19	300	250 AC
	0301	25.70	Sand pit at Honey Hole	300	200 AC
	0302	23.41	330 m downstream from Ponderosa	120	150 AC
	0303	21.44	County Road downstream from I 81	150	150 AC
	0401	19.90	T 364	300	125 AC
	0402	17.46	Private Road	40	200 AC
	0501	14.55	T 336	NA	NA
	0502	12.17	T 332	NA	NA
	0503	9.28	SR 3038	NA	NA
	0601	7.27	SR 3042	NA	NA
	0602	4.88	SR 3042	NA	NA
	0603	1.14	SR 3014	NA	NA
Little Nescopeck Creek[A]	0102	3.67	County Road	90	500 DC
	0201	1.67	SR 437	324	250 AC
Conety Run	0101	0.78	SR 437	300	500 DC
Long Hollow	0101	0.21	340 m upstream from mouth	328	300 DC
Oley Creek	0101	3.91	Game Lands road crossing	300	300 DC
Long Run	0101	1.33	Private Bridge at Boy Scout Camp	300	200 DC

Continued on next page.

Table 3. Continued.

Stream	Station Number	River Mile	Downstream Limit	Length (m)	Volts
Little Nescopeck Creek[B]	0101	7.32	SR 309	NA	NA
	0102	5.21	SR 3021	NA	NA
	0103	2.77	T 338	NA	NA
	0104	0.66	County Road	NA	NA
Black Creek	0201	15.36	SR 93	150	100 AC
	0202	11.72	Power line crossing	NA	NA
	0301	7.35	Private Bridge in Derringer	30	100 AC
	0302	3.11	210 m downstream from SR 3018	NA	NA
	0303	0.00	Mouth	NA	NA
Stony Creek	0101	0.26	415 m upstream from mouth	150	300 DC

NA = Not Available.

Table 4. Station number, river mile, downstream limit, length electrofished, and voltage for stations sampled on unnamed tributaries during 1999 in the Nescopeck Creek basin (405D).

Stream	Station Number	River Mile	Downstream Limit	Length (m)	Volts
Unnamed Tributary 01	0101	1.52	T 722	NA	NA
Unnamed Tributary 02	0101	1.08	300 m downstream from T 381	300	200 DC
Unnamed Tributary 03	0101	0.34	300 m dnst 2nd bridge upst mouth	300	200 DC
Unnamed Tributary 04	0101	0.15	SR 3038	120	200 DC
Unnamed Tributary 05	0101	0.38	SR 3038	300	200 DC
Unnamed Tributary 06	0101	0.32	T 339	30	200 DC
Unnamed Tributary 07	0101	0.95	T 421	300	200 DC
Unnamed Tributary 08	0101	0.53	T 421	NA	NA
Unnamed Tributary 09	0101	1.33	T 421	NA	200 DC
Unnamed Tributary 11	0101	0.95	County Road	300	200 DC
Unnamed Tributary 12	0101	0.19	County Road	300	300 DC
Unnamed Tributary 13	0101	0.55	County Road	60	300 DC
Unnamed Tributary 15	0101	0.13	County Road	300	300 DC
Unnamed Tributary 16	0101	0.11	County Road	30	300 DC
Unnamed Tributary 17	0101	1.52	County Road	300	300 DC
Unnamed Tributary 18	0101	0.00	Mouth	300	300 DC
Unnamed Tributary 19	0101	0.76	County Road	300	400 DC

NA = Not Available.

Table 8. Continued.

Stream	River Mile	Date	Time	Air Temp. (°C)	Water Temp. (°C)	pH	Total Alkalinity (mg/l)	Total Hardness (mg/l)	Specific Conductance (umhos)
Little Nescopeck Creek[B]	7.32	8/30	1325	25.0	17.3	7.1	66	96	631
	5.21	8/30	1340	25.0	11.6	4.7	0	>100	878
	2.77	8/30	1400	24.0	12.3	4.7	0	>100	861
	0.66	8/30	1410	25.0	12.6	4.7	0	>200	841
Black Creek	15.36	7/23	1140	33.0	23.4	6.2	12	20	164
	11.72	7/23	1055	28.0	21.0	6.6	12	32	246
	7.35	7/23	0945	24.0	21.6	6.0	< 1	24	209
	3.11	7/22	1500	29.0	18.5	4.6	0	60	261
	0.00	7/22	1415	32.0	20.1	4.9	0	>100	252
Stony Creek	0.26	8/31	1445	26.0	16.8	5.3	2	>100	27

Table 9. Physical-chemical data collected at sampling stations on unnamed tributaries in the Nescopeck Creek basin (405D) during 1999.

Stream	River Mile	Date	Time	Air Temp. (°C)	Water Temp. (°C)	pH	Total Alkalinity (mg/l)	Total Hardness (mg/l)	Specific Conductance (umhos)
Unnamed Tributary 01	1.52	8/24	1005	21.0	16.2	7.1	24	42	113
Unnamed Tributary 02	1.08	8/24	0920	20.0	16.5	7.3	22	46	171
Unnamed Tributary 03	0.34	8/24	1130	23.0	16.4	7.1	18	32	114
Unnamed Tributary 04	0.15	8/25	1240	25.0	18.8	7.2	24	46	190
Unnamed Tributary 05	0.38	8/24	1410	28.0	16.2	7.1	18	46	170
Unnamed Tributary 06	0.32	8/25	1330	27.0	18.2	6.7	24	76	323
Unnamed Tributary 07	0.95	8/25	1425	28.0	19.5	6.9	12	16	160
Unnamed Tributary 08	0.53	8/26	1145	25.0	16.2	6.8	20	34	96
Unnamed Tributary 09	1.33	8/26	1200	25.0	16.9	6.9	14	81	345
Unnamed Tributary 11	0.95	8/30	1030	19.0	11.6	6.7	5	16	134
Unnamed Tributary 12	0.19	7/14	0940	19.0	16.4	6.6	6	8	22
Unnamed Tributary 13	0.55	7/14	1130	22.0	16.1	5.8	1	5	17
Unnamed Tributary 15	0.13	7/14	1420	28.0	15.5	6.0	2	6	19
Unnamed Tributary 16	0.11	7/15	1145	23.0	15.2	5.5	1	12	23
Unnamed Tributary 17	1.52	7/15	1230	26.0	15.7	6.9	5	10	45
Unnamed Tributary 18	0.00	7/14	1240	25.0	18.7	6.2	5	10	59
Unnamed Tributary 19	0.76	7/15	1410	27.0	14.6	6.1	2	6	40

Table 10. Fish species captured at electrofishing sites in Nescopeck Creek (405D) during 1999.

Species	RM 33.30	RM 25.70	RM 23.41	RM 21.44	RM 19.90	RM 17.46
Brown trout		X	X	X	X	X
Brook trout	X	X				
Chain pickerel		X				
Cutlips minnow	X	X	X		X	X
Common shiner	X	X	X	X	X	X
Blacknose dace	X	X	X	X	X	X
Longnose dace	X	X	X	X	X	X
Creek chub						X
Fallfish	X	X		X	X	X
White sucker	X	X	X	X	X	X
Margined madtom	X	X	X		X	X
Pumpkinseed	X					
Largemouth bass		X				
Tessellated darter	X	X	X	X	X	X
Sculpins		X	X	X	X	X
Total Species:	10	13	9	8	10	11

RM = River Mile.

Table 11. Fish species captured at electrofishing sites in named tributaries of the Nescopeck Creek basin (405D) during 1999.

Species	Creasy Creek RM 3.38	Creasy Creek RM 1.41	Ltl Nesc Ck[A] RM 3.67	Ltl Nesc Ck[A] RM 1.67	Conety Run RM 0.78	Long Hollow RM 0.21	Oley Creek RM 3.91	Long Run RM 1.33	Black Creek RM 15.36	Black Creek RM 7.35	Stony Creek RM 0.26
Brown trout						X	X				
Brook trout	X	X	X	X	X	X	X	X			X
Chain pickerel		X	X	X							
Golden shiner									X		
Fathead minnow									X		
Blacknose dace	X	X					X	X	X		
Creek chub	X	X						X	X		
White sucker									X		
Bluespotted sunfish		X									
Green sunfish	X										
Pumpkinseed					X				X		
Largemouth bass	X										
Tessellated darter		X									
Sculpins						X	X				
Total Species:	5	6	2	2	2	3	4	3	6	0	1

Ltl Nesc Ck[A] = Little Nescopeck Creek[A]; RM = River Mile.

Table 12. Fish species captured at electrofishing sites in unnamed tributaries of the Nescopeck Creek basin (405D) during 1999.

	Unnamed Tributary														
	02	03	04	05	06	07	09	11	12	13	15	16	17	18	19
Species	RM 1.08	RM 0.34	RM 0.15	RM 0.38	RM 0.32	RM 0.95	RM 1.33	RM 0.95	RM 0.19	RM 0.55	RM 0.13	RM 0.11	RM 1.52	RM 0.00	RM 0.76
Brown trout											X				
Brook trout	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cutlips minnow														X	
Blacknose dace	X	X	X		X	X			X					X	
Longnose dace						X								X	
Creek chub	X					X			X					X	
Fallfish														X	
White sucker						X								X	
Margined madtom														X	
American eel						X									
Green sunfish						X									
Pumpkinseed						X									
Largemouth bass		X													
Tessellated darter						X			X					X	
Sculpins		X		X		X	X	X							
Total Species: 3		4	2	2	2	10	2	2	4	1	2	1	1	9	1

RM = River Mile.

Table 13. Length-frequency distribution ((M+C)-R) for wild trout captured in named streams of the Nescopeck Creek basin (405D) during 1999.

Stream	River Mile	Species	Length Group (mm) 25	50	75	100	125	150	175	200	225	250	275	Total
Creasy Creek	3.38	Brook	1	64	9	18	7	8	4	1	0	0	0	112
	1.41	Brook	0	58	27	61	31	25	9	4	0	0	0	215
Nescopeck Creek	33.30	Brook	0	6	1	7	2	3	2	0	0	0	0	21
	23.41	Brown	0	1	0	0	0	0	0	0	0	0	0	1
	19.90	Brown	0	0	0	0	0	1	0	0	0	0	0	1
	17.46	Brown	0	0	0	0	0	2	0	0	0	0	0	2
Little Nescopeck Creek[A]	3.67	Brook	0	0	0	1	1	0	0	0	0	0	0	2
	1.67	Brook	10	173	30	60	35	24	15	5	0	1	0	353
Conety Run	0.78	Brook	0	45	59	62	23	6	8	0	0	0	0	203
Long Hollow	0.21	Brook	41	49	145	54	34	7	1	0	0	0	0	331
		Brown	0	0	0	2	1	0	0	0	0	0	0	3
Oley Creek	3.91	Brook	14	74	74	97	53	15	2	1	1	0	0	331
		Brown	1	0	4	5	5	3	1	3	1	1	1	25
Long Run	1.33	Brook	4	84	50	63	30	8	0	0	0	0	0	239
Stony Creek	0.26	Brook	0	0	0	0	0	1	1	0	0	0	0	2

Table 14. Length-frequency distribution ((M+C)-R) for wild trout captured in unnamed tributaries of the Nescopeck Creek basin (405D) during 1999.

Stream	River Mile	Species	Length Group (mm) 25	50	75	100	125	150	175	200	225	250	275	Total
Unnamed Tributary 02	1.08	Brook	0	0	0	0	0	0	0	0	1	1	0	2
Unnamed Tributary 03	0.34	Brook	0	3	6	7	18	9	1	3	0	0	0	47
Unnamed Tributary 04	0.15	Brook	0	19	14	29	7	7	0	0	0	0	0	76
Unnamed Tributary 05	0.38	Brook	0	80	28	89	25	12	3	2	0	0	0	239
Unnamed Tributary 07	0.95	Brook	1	84	20	56	27	13	7	6	2	0	0	216
Unnamed Tributary 11	0.95	Brook	2	150	101	112	79	32	20	3	2	1	0	502
Unnamed Tributary 12	0.19	Brook	0	44	22	49	24	8	1	0	0	0	0	148
Unnamed Tributary 13	0.55	Brook	0	1	1	0	0	0	0	0	0	0	0	2
Unnamed Tributary 15	0.13	Brook	3	45	2	34	28	7	1	0	0	0	0	120
		Brown	0	0	0	1	0	0	0	0	0	0	0	1
Unnamed Tributary 16	0.11	Brook	0	0	0	4	0	1	0	0	0	0	0	5
Unnamed Tributary 17	1.52	Brook	4	65	58	58	30	2	2	0	0	0	0	219
Unnamed Tributary 18	0.00	Brook	0	7	0	5	3	0	0	0	0	0	0	15
Unnamed Tributary 19	0.76	Brook	7	78	63	78	54	17	7	0	0	0	0	304

Table 15. Estimated population abundance and biomass of wild trout in named stream sections of the Nescopeck Creek basin (405D) during 1999.

Stream (Section)	Species	Number/Kilometer		Number/Hectare		Kilograms/Hectare		
		< 175 mm	≥ 175 mm	< 175 mm	≥ 175 mm	< 175 mm	≥ 175 mm	Total
Creasy Creek (01)	Brook	824	38	2,977	130	29.92	9.03	38.95
Nescopeck Creek (02)	Brook	63	7	74	8	1.11	0.49	1.60
Nescopeck Creek (03)	Brown	3	0	2	0	0.01	0.00	0.01
Nescopeck Creek (04)	Brown	27	0	15	0	0.66	0.00	0.66
Ltl Nescopeck Ck[A] (01)	Brook	22	0	100	0	1.90	0.00	1.90
Ltl Nescopeck Ck[A] (02)	Brook	1,541	70	3,123	142	28.28	10.61	38.89
Conety Run (01)	Brook	882	33	2,945	109	27.87	6.86	34.73
Long Hollow	Brook	1,591	3	10,434	20	75.45	1.26	76.71
	Brown	9	0	60	0	1.08	0.00	1.08
							Total:	77.79
Oley Creek	Brook	1,725	13	6,472	51	60.67	4.33	65.00
	Brown	68	22	255	90	4.91	11.43	16.34
							Total:	81.34
Long Run	Brook	1,083	0	3,612	0	31.23	0.00	31.23
Stony Creek	Brook	7	7	25	25	1.03	1.58	2.61

Table 16. Estimated population abundance and biomass of wild trout in unnamed tributaries in the Nescopeck Creek basin (405D) during 1999.

Stream	Species	Number/Kilometer		Number/Hectare		Kilograms/Hectare		
		< 175 mm	≥ 175 mm	< 175 mm	≥ 175 mm	< 175 mm	≥ 175 mm	Total
Unnamed Tributary 02	Brook	0	7	0	26	0.00	3.85	3.85
Unnamed Tributary 03	Brook	151	16	505	55	11.31	4.74	16.05
Unnamed Tributary 04	Brook	764	0	4,583	0	58.57	0.00	58.57
Unnamed Tributary 05	Brook	1,026	17	5,128	83	53.55	6.18	59.73
Unnamed Tributary 07	Brook	1,152	54	3,457	160	32.54	13.08	45.62
Unnamed Tributary 11	Brook	2,471	102	9,263	383	101.24	28.22	129.46
Unnamed Tributary 12	Brook	791	3	3,958	17	39.62	1.05	40.67
Unnamed Tributary 13	Brook	33	0	476	0	1.91	0.00	1.91
Unnamed Tributary 15	Brook	685	3	5,137	25	57.06	1.58	58.64
	Brown	3	0	25	0	0.35	0.00	0.35
							Total:	58.99
Unnamed Tributary 16	Brook	167	0	3,334	0	64.66	0.00	64.66
Unnamed Tributary 17	Brook	1,288	7	6,443	33	46.80	2.10	48.90
Unnamed Tributary 18	Brook	50	0	136	0	1.43	0.00	1.43
Unnamed Tributary 19	Brook	1,623	23	6,087	88	59.75	5.51	65.26

Table 17. Pennsylvania Fish and Boat Commission (PFBC) and current Pennsylvania Department of Environmental Protection (DEP) classifications, recommended DEP classification upgrades, recommended PFBC management programs, and angler expectation ratings for named stream sections in the Nescopeck Creek basin (405D).

Stream (Section)	Classification PFBC	Classification DEP	Recommended DEP Upgrade	Recommended PFBC Management Program	Angler Expectation Rating
Creasy Creek (01)	A R4	CWF	HQ-CWF	Wild Trout Waters	Poor
Mill Creek (01)	R	CWF	None	Natural Yield	NA
Reilly Creek (01)	R	CWF	None	Natural Yield	NA
Nescopeck Creek (01)	R	HQ-CWF	None	Natural Yield	NA
Nescopeck Creek (02)	DGR2	HQ-CWF	None	Delayed Harvest	Poor
Nescopeck Creek (03)	DGR2	HQ-CWF	None	Optimum Yield 2	Poor
Nescopeck Creek (04)	D S2	HQ-CWF & TSF	None	Natural Yield	Poor
Nescopeck Creek (05)	S2	TSF	None	Polluted/No Fishery	NA
Nescopeck Creek (06)	S1	TSF	None	Polluted/No Fishery	NA
Ltl Nescopeck Ck[A] (01)	D R4	CWF	HQ-CWF	Natural Yield	Poor
Ltl Nescopeck Ck[A] (02)	A R3	CWF	HQ-CWF	Wild Trout Waters	Good
Conety Run (01)	A R4	CWF	HQ-CWF	Wild Trout Waters	Good
Long Hollow (01)	A R4	HQ-CWF	None	Wild Trout Waters	Poor
Oley Creek (01)	A R3	HQ-CWF	None	Wild Trout Waters	Poor
Oley Creek (02)	R	HQ-CWF & CWF	None	Natural Yield	NA
Long Run (01)	A S4	CWF	HQ-CWF	Wild Trout Waters	Poor
Ltl Nescopeck Ck[B] (01)	S	CWF	None	Polluted/No Fishery	NA

Continued on next page.

Table 17. Continued.

Stream (Section)	Classification PFBC	Classification DEP	Recommended DEP Upgrade	Recommended PFBC Management Program	Angler Expectation Rating
Black Creek (01)	U	CWF	None	Polluted/No Fishery	NA
Black Creek (02)	D S3	CWF	None	Polluted/No Fishery	Poor
Black Creek (03)	D R2	CWF	None	Polluted/No Fishery	Poor
Cranberry Creek (01)	U	CWF	None	Natural Yield	NA
Stony Creek (01)	D U4	CWF	None	Natural Yield	Poor

NA = Not Available.

Table 18. Pennsylvania Fish and Boat Commission (PFBC) and current Pennsylvania Department of Environmental Protection (DEP) classifications, recommended DEP classification upgrades, recommended PFBC management programs, and angler expectation ratings for unnamed tributaries in the Nescopeck Creek basin (405D).

Stream	Classification PFBC		DEP	Recommended DEP Upgrade	Recommended PFBC Management Program	Angler Expectation Rating
Unnamed Tributary 01			CWF	None	Natural Yield	NA
Unnamed Tributary 02	D	4	CWF	None	Natural Yield	Poor
Unnamed Tributary 03	C	4	CWF	None	Natural Yield	Poor
Unnamed Tributary 04	A	4	CWF	HQ-CWF	Wild Trout Waters	Poor
Unnamed Tributary 05	A	4	CWF	HQ-CWF	Wild Trout Waters	Poor
Unnamed Tributary 06	D		CWF	None	Natural Yield	NA
Unnamed Tributary 07	A	4	CWF	HQ-CWF	Wild Trout Waters	Excellent
Unnamed Tributary 08			CWF	None	Natural Yield	NA
Unnamed Tributary 09			CWF	None	Natural Yield	NA
Unnamed Tributary 10			CWF	None	Natural Yield	NA
Unnamed Tributary 11	A	4	HQ-CWF	None	Wild Trout Waters	Excellent
Unnamed Tributary 12	A	4	HQ-CWF	None	Wild Trout Waters	Poor
Unnamed Tributary 13	D	4	HQ-CWF	None	Natural Yield	Poor

Continued on next page.

Table 18. Continued.

Stream (Section)	Classification PFBC	Classification DEP	Recommended DEP Upgrade	Recommended PFBC Management Program	Angler Expectation Rating
Unnamed Tributary 14		HQ-CWF	None	Natural Yield	NA
Unnamed Tributary 15	A 4	HQ-CWF	None	Wild Trout Waters	Poor
Unnamed Tributary 16	A 4	HQ-CWF	None	Wild Trout Waters	Poor
Unnamed Tributary 17	A 4	HQ-CWF	None	Wild Trout Waters	Poor
Unnamed Tributary 18	D 4	HQ-CWF	None	Natural Yield	Poor
Unnamed Tributary 19	A 4	HQ-CWF	None	Wild Trout Waters	Poor

NA = Not Available.

Appendix A. National Pollution Discharge Elimination System (NPDES) permitted discharges in the Nescopeck Creek basin (405D).

Discharge	Receiving Water	Average Design Flow (mgd)
Butler Township Municipal Authority (St Johns)	Nescopeck Creek	0.600
Nescopeck Borough	Nescopeck Creek	0.110
Conyngham Borough Authority	Nescopeck Creek	NA
Days Inn	Unnamed Tributary 6	0.025
Pilot Corporation	Unnamed Tributary 6	NA
Greater Hazleton Joint Sewer Authority	Black Creek	8.900
Hazleton Area School District	Black Creek	0.020
Eckley Miners Village	Unnamed Tributary to Black Creek	0.020
Wilkes-Barre Family YMCA	Creasy Creek	0.009
Butler Township Municipal Authority (Drums)	Little Nescopeck Creek[B]	0.400

NA = Not Available.

Source: United States Environmental Protection Agency Envirofacts Warehouse (www.epa.gov/enviro/html/pcs/pcs_query_java.html).

Table 8. Physical-chemical data collected at sampling stations on named streams in the Nescopeck Creek basin (405D) during 1999.

Stream	River Mile	Date	Time	Air Temp. (°C)	Water Temp. (°C)	pH	Total Alkalinity (mg/l)	Total Hardness (mg/l)	Specific Conductance (umhos)
Creasy Creek	3.38	7/19	1500	33.0	20.1	6.9	12	15	49
	1.41	7/20	1300	29.0	19.4	7.2	24	24	74
Reilly Creek	0.06	7/21	1010	24.0	21.3	6.4	22	28	97
Nescopeck Creek	33.30	7/20	1600	32.0	23.0	6.8	10	18	46
	25.70	7/12	1315	27.0	19.3	6.6	13	18	73
	23.41	7/12	1115	26.0	19.3	7.0	13	24	82
	21.44	7/12	1015	23.0	17.1	7.1	14	27	106
	19.90	7/13	1500	28.0	19.7	7.1	13	25	116
	17.46	7/13	1400	27.0	19.8	7.0	14	28	112
	14.55	7/13	1300	25.0	16.8	4.7	0	>100	591
	12.17	7/13	1200	24.0	16.6	4.7	0	>100	581
	9.28	7/13	1125	22.0	17.4	4.7	0	>100	575
	7.27	7/13	1035	22.0	16.5	4.7	0	>100	486
	4.88	7/13	0950	22.0	17.5	4.8	0	>100	505
	1.14	7/13	0915	21.0	18.1	4.7	0	>100	481
Little Nescopeck Creek[A]	3.67	7/19	1415	32.0	21.8	5.8	2	3	19
	1.67	7/19	1230	32.0	20.1	7.0	5	8	24
Conety Run	0.78	7/16	1200	30.0	18.5	6.2	2	5	22
Long Hollow	0.21	7/21	1325	24.0	16.5	6.4	14	16	32
Oley Creek	3.91	7/21	1100	26.0	16.3	6.4	6	7	63
Long Run	1.33	8/26	1500	22.0	18.1	6.6	4	21	192

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Table 7. Physical data for unnamed tributaries sampled during 1999 in the Nescopeck Creek basin (405D).

Stream	Length (km)	Width (m)	Gradient (m/km)	USGS Quadrangle(s)
Unnamed Tributary 01	4.1	NA	22.7	J35, J36
Unnamed Tributary 02	4.1	2.8	28.2	J36
Unnamed Tributary 03	3.2	2.9	25.5	J36
Unnamed Tributary 04	1.8	1.6	41.4	J37
Unnamed Tributary 05	1.8	1.9	37.9	J37
Unnamed Tributary 06	1.8	NA	31.0	J37
Unnamed Tributary 07	3.6	3.3	20.3	J37
Unnamed Tributary 08	1.5	NA	14.6	J37
Unnamed Tributary 09	2.8	NA	16.3	J37
Unnamed Tributary 10	3.4	NA	23.6	J38
Unnamed Tributary 11	1.9	2.6	13.3	J38
Unnamed Tributary 12	1.6	1.9	46.0	J38
Unnamed Tributary 13	3.1	0.7	73.0	J38
Unnamed Tributary 14	2.5	NA	70.0	J38
Unnamed Tributary 15	3.1	1.2	53.0	J38
Unnamed Tributary 16	2.3	0.5	77.1	J38
Unnamed Tributary 17	4.9	2.0	32.7	J38, J39
Unnamed Tributary 18	0.6	3.5	10.0	J38
Unnamed Tributary 19	4.6	2.8	40.0	J39

USGS Quadrangles: J35 = Mifflinville; J36 = Berwick; J37 = Sybertsville; J38 = Freeland; J39 = White Haven. NA = Not Available.

Table 6. Physical and social data for named stream sections in the Nescopeck Creek basin (405D).

Stream (Section)	Length (km)	Width (m)	Gradient (m/km)	USGS Quadrangle(s)	Proximity to roads: % of Section within 100m	300m	500m	1990 Human Population Density (#Persons/km^2)
Creasy Creek (01)	7.4	2.8	14.2	I39, J39	16	36	75	9
Mill Creek	4.7	NA	4.5	J39	11	54	74	9
Reilly Creek	3.1	NA	13.9	J39	12	40	60	9
Nescopeck Creek (01)	1.9	NA	6.0	J39	8	22	45	9
Nescopeck Creek (02)	3.6	10.2	2.9	J38, J39	0	0	0	9
Nescopeck Creek (03)	16.5	11.6	1.8	J37, J38	22	53	73	39
Nescopeck Creek (04)	6.5	14.0	3.9	J37	35	83	100	67
Nescopeck Creek (05)	14.2	18.6	5.2	J36, J37, K36	39	77	92	45
Nescopeck Creek (06)	13.8	25.3	3.0	J36	45	79	91	41
Little Nescopeck Ck[A] (01)	5.4	1.8	17.2	I39, J39	34	52	69	9
Little Nescopeck Ck[A] (02)	5.6	4.8	17.8	J39	27	35	44	9
Conety Run	4.3	3.0	42.2	I39, J39	20	43	57	33
Long Hollow	3.5	2.0	48.7	J39	0	0	0	20
Oley Creek (01)	3.7	4.5	15.2	J38, J39	0	0	0	20
Oley Creek (02)	3.2	NA	11.2	J38	NA	NA	NA	39
Long Run	4.4	2.9	26.1	J37, J38	2	47	52	70
Little Nescopeck Creek[B]	12.4	NA	9.0	J37, J38, K37	30	77	97	67
Black Creek (01)	7.3	NA	2.5	K38	9	28	42	152
Black Creek (02)	15.4	6.6	7.3	K36, K37, K38	30	66	91	63
Black Creek (03)	12.2	11.8	12.7	J36, K36	82	87	91	31
Cranberry Creek	5.1	NA	18.4	K37, K38	9	40	74	258
Stony Creek	3.9	2.5	15.2	K37	0	0	0	258

USGS Quadrangles: I39 = Wilkes-Barre East; J36 = Berwick; J37 = Sybertsville; J38 = Freeland; J39 = White Haven; K36 = Nuremberg; K37 = Conyngham; K38 = Hazleton. NA = Not Available.

Table 5. Scientific and common names of fish species captured in the Nescopeck Creek basin (405D) during the 1999 and historic surveys.

Scientific name	Common Name	1999	Historic
Salmo trutta	Brown trout	X	X
Salvelinus fontinalis	Brook trout	X	X
Esox niger	Chain pickerel	X	X
Exoglossum maxillingua	Cutlips minnow	X	X
Notemigonus crysoleucas	Golden shiner	X	
Luxilus cornutus	Common shiner	X	X
Pimephales promelas	Fathead minnow	X	
Rhinichthys atratulus	Blacknose dace	X	X
Rhinichthys cataractae	Longnose dace	X	X
Semotilus atromaculatus	Creek chub	X	X
Semotilus corporalis	Fallfish	X	X
Catostomus commersoni	White sucker	X	X
Noturus insignis	Margined madtom	X	X
Ameiurus nebulosus	Brown bullhead		X
Anguilla rostrata	American eel	X	
Enneacanthus gloriosus	Bluespotted sunfish	X	
Lepomis cyanellus	Green sunfish	X	
Lepomis gibbosus	Pumpkinseed	X	X
Lepomis macrochirus	Bluegill		X
Micropterus salmoides	Largemouth bass	X	X
Etheostoma olmstedi	Tessellated darter	X	X
Cottus spp.	Sculpins	X	X
Total species:		20	17