

DEP Stream Code: 30269

PA FISH AND BOAT COMMISSION
COMMENTS AND RECOMMENDATIONS

July 18, 2002

DEP via ES

Satterlee Run

RECEIVED

AUG 12 2002

WATER: South Branch Towanda Creek Basin (404C) Bradford County

EXAMINED: July 2001

BY: Moase, Wnuk, Minnichbach, and Gearhart

PA Fish & Boat Commission
Division of Environmental Services
Date: 8-6-02

Bureau Director Action: [Signature]

Division Chief Action: [Signature] - success

WW Unit Leader Action: _____

CW Unit Leader Action: R. Thomas

CWU COMMENTS:

The Towanda Creek, South Branch (404C) basin was examined during July 2001 to update inventory information on Towanda Creek, South Branch, Sections 01-03, and to collect baseline inventory information on seven tributary streams.

Towanda Creek, South Branch

Section 01

Section 01 can be characterized as a small, freestone stream. In 2001 a total of 14 fish species were captured over two sample sites, including a single wild brook trout at Site RM 9.70.

Section 02

This segment can be characterized as a moderate size, freestone stream. Historically, Section 02 has been managed with the planting of PFBC catchable trout. A total of 18 fish species were captured over three sample sites in 2001, including five brown trout of hatchery origin and a single wild brown trout at Site RM 2.50.

Section 03

Section 03 can be characterized as a moderate size, freestone stream. A total of 17 fish species were captured in 2001, including a single smallmouth bass.

Beaver Run

Section 01 can be characterized as a small, freestone stream. A total of seven nongame fish species were captured in 2001.

Ladds Creek

Section 01 can be characterized as a small, coldwater stream. A total of four fish species were captured in 2001, including a good population of wild brook trout (391/km, 28.20 kg/ha). Overall, the estimated abundance of legal size (≥ 7 inches) wild brook trout was 10/km. Based on a section length of 2.77 miles (4.46 km) this translated into an estimated total of 45 legal size brook trout ranging from seven to eight inches in length in Ladds Creek, Section 01.

Fenner Run

Section 01 can be characterized as a small, coldwater stream. No fish were captured over 150 meters of electrofishing beginning at Site RM 0.20.

Satterlee Run

Section 01 can be characterized as a small, coldwater stream. Two fish species were captured during the 2001 examination, including a fine population of wild brook trout estimated at 1,854/km and 44.32 kg/ha. The estimated abundance of legal size (≥ 7 inches) wild brook trout was 20/km. Based on a section length of 4.35 miles (7.0 km) this translated into an estimated total of 140 legal size brook trout ranging from seven to eight inches in length in Satterlee Run, Section 01.

Kent Run

Section 01 can be characterized as a small, coldwater stream. Three fish species were captured during the 2001 inventory, including a fair population of wild brook trout estimated at 207/km and 17.91 kg/ha. Overall, the estimated abundance of legal size (≥ 7 inches) wild brook trout was 20/km. Based on a section length of 3.19 miles (5.14 km) this translated into a total of 103 legal size brook trout ranging from seven to nine inches in length in Kent Run, Section 01.

Other Tributary Streams

Due to low stream flows only water chemistry data were collected on Bowman Creek and French Creek. Both streams could be characterized as moderately, fertile, small, freestone streams.

CWU RECOMMENDATIONS:

1. Towanda Creek, South Branch (404C), Section 02, should continue to be managed with the planting of PFBC catchable size trout. Stocking should be conducted on a preseason only basis according to program guidelines.
2. Satterlee Run (404C), Section 01, should be managed as a Class A wild brook trout fishery. Conventional statewide regulations should apply with no stocking. I concur with the Area 4 recommendation stating that due to the presence of a Class A wild brook trout fishery, the

DEP Chapter 93 Water Quality Standards should be upgraded to HQ-CWF for the Satterlee Run basin. A copy of this report should be forwarded to DEP via Environmental Services.

3. I also concur with the Area 4 recommendation stating that Towanda Creek, South Branch, Sections 01 and 03; Bowman Creek, Section 01; French Creek, Section 01; Ladds Creek, Section 01; Fenner Run, Section 01; and Kent Run, Section 01, should be managed with conventional statewide angling regulations under the Natural Yield option.

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

South Branch Towanda Creek Basin (404C)
Fisheries Management Report

Prepared by:
Robert Wnuk, Robert Moase, and Matthew Gearhart

Fisheries Management Database Name: Towanda Ck S Br
Lat/Lon: 414231762810

Date Sampled: July 2001 Date Prepared: November 2001

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 to document a stream's fish populations and to collect social, physical, and chemical data that influence the way we manage its fishery. Establishing relationships among these parameters allows us to place each individual stream section into a resource category. Once we've assigned a section to a resource category, we can implement a management program that is consistent with statewide goals and objectives.

The Area 4 fisheries management office has been conducting stream examinations on a drainage basin level to facilitate management by resource classification. We selected the South Branch Towanda Creek basin for investigation in 2001 because we'd never previously surveyed any of its tributary streams and because Area 5 Fisheries Technician Joseph Minnichbach reported a wild trout population in Kent Run. Additionally, the most recent information we had on the South Branch of Towanda Creek was 23 years old. Thus, the objectives of this examination were: 1) to collect baseline data on the fishery in tributary streams which had never been surveyed so that they could be assigned to a resource category and 2) to evaluate past management practices on the South Branch of Towanda Creek and implement new management strategies where appropriate.

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Study Area

Satterlee Run

The South Branch of Towanda Creek originates from the outlet of an unnamed pond on State Game Lands (SGL) 142 in Wilmot Township, Bradford County. It flows generally north-northwest for 25 km to the confluence with Towanda Creek at River Mile (RM) 4.30, 41°42'31" Latitude and 76°28'10" Longitude, near Monroeton (Figure 1). The South Branch of Towanda Creek drains an area of approximately 126 km² in Bradford and, peripherally, Sullivan Counties. The Colley, Dushore, and Monroeton United States Geological Survey's 7.5 minute Quadrangles provide topographic coverage for the drainage. Routes 220 and 414 provide major road access.

The South Branch Towanda Creek basin contains eight named streams (Table 1) and several unnamed tributaries, wetlands, farm ponds, and small glacial lakes. Major public lands include SGL 36, SGL 142, SGL 240, and the Tioga State Forest. The upper and lower portions of the basin lie in the Glaciated Low Plateau physiographic province (Figure 2). The underlying geology of this province consists of Devonian age shales, siltstones, and sandstones from the Catskill and Lock Haven Formations (Woods and Omernik 1996). Land use is a mixture of agriculture, woodlots, and scattered single family rural residences, although the boroughs of New Albany and Monroeton contain more concentrated residential development. Relatively broad valleys framed by low rolling hills characterize the topography.

In contrast, the middle portion of the South Branch Towanda Creek basin, which roughly encompasses the area between the Route 220 bridge and the northern edge of Kellogg Mountain, lies in the Glaciated High Plateau physiographic province. The underlying geology of this province consists of sedimentary, acidic strata of mostly Mississippian and Pennsylvanian Age with some Devonian Age rocks (Woods and Omernik 1996). The Pennsylvanian Age rocks include small deposits of Anthracite coal from the Pottsville Group. Land use is primarily northern hardwood forest with some vacation home development. Deeply dissected valleys framed by steep hills form a narrow gorge in this area of stream.

Historic Perspective

We have three surveys on file for the South Branch Towanda Creek basin. Bradford (1953) examined water quality in the South Branch and several tributary streams following a request for trout stocking by Mr. David Fisher, Justice of the Peace in New Albany (Fisher 1953). Bradford (1953) documented moderately fertile water quality throughout the drainage and observed minnows and suckers in the streams. He recommended against trout stocking in the South Branch due to poor physical conditions, susceptibility to drought, and a lack of bottom organisms. Nevertheless, the PFBC stocked 150 fingerling brown trout *Salmo trutta* in the South Branch of Towanda Creek in 1956 and 450 in 1958. Bradford (1953)

also referred to a past survey of Satterlee Run but we have no record of this work.

Daniels et al. (1975) examined four sites on the South Branch of Towanda Creek following a request for trout stocking by the Monroeton Rod and Gun Club (Hesser 1975). The investigators found moderately fertile water quality, a diverse aquatic macroinvertebrate community, and 15 fish species indicative of transitional and warmwater habitats. The only gamefish present was a single adult smallmouth bass *Micropterus dolomieu*. Daniels et al. (1975) noted minimal pollution problems resulting from logging related turbidity and flood related scouring of the stream bottom but, in contrast to Bradford (1953), they found the stream suitable for trout stocking. As a result, the PFBC added the portion of the South Branch of Towanda Creek from Stevenson to Kellogg to the list of approved trout waters beginning with the 1976 season.

Daniels et al. (1978) conducted our most recent survey of the South Branch Towanda Creek. These investigators examined seven stations on the South Branch as part of the statewide inventory of trout stocked waters. Water quality was moderately fertile throughout the length of the stream and aquatic macroinvertebrate populations were relatively diverse despite silted conditions. As in 1975, transitional and warmwater species dominated the fish community. Sparse numbers of hatchery brown trout and fingerling smallmouth bass were the only gamefish present. Daniels et al. (1978) did not recommend any changes in the trout stocking policy.

Current Management Strategies

The Pennsylvania Department of Environmental Protection classifies the entire South Branch Towanda Creek basin as a coldwater fishery (CWF) in its Chapter 93 water quality regulations. There are no exceptions to specific criteria. The CWF designation requires that all National Pollution Discharge Elimination System (NPDES) permitted discharges in the basin meet water quality standards designed to protect reproducing trout populations and associated flora and fauna. Currently, we know of only one NPDES discharge in the basin (United States Environmental Protection Agency 2001). This discharge originates from the New Albany Borough sewage treatment plant. It has a design flow of 0.04 million gallons per day (mgd) and discharges to the South Branch of Towanda Creek.

With the exception of the South Branch, the PFBC manages all of the basin streams as a single section extending from the headwaters downstream to the mouth under statewide angling regulations with no stocking. We manage the South Branch of Towanda Creek as three separate sections. Section 01 extends from the headwaters downstream to the Route 220 bridge near Stevenson, Section 02 extends from the Route 220 bridge downstream to the T-

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Satterlee Run

402 bridge near Kellogg, and Section 03 extends from the T-402 bridge downstream to the mouth. We manage Section 02 for hatchery trout under the Optimum Yield 2 - Rural program with statewide angling regulations and pre-season stocking only. Special remarks prohibit the substitution of rainbow trout *Oncorhynchus mykiss* because of past problems with fish kills when this species worked its way downstream into Towanda Creek. Towanda Creek was quite acid near the confluence with the South Branch because of acid mine drainage input from the Schrader Creek watershed. This situation may have improved since the installation of mine drainage abatement systems along Schrader Creek.

Methods

We examined the South Branch Towanda Creek basin between July 5 and 25, 2001. All procedures of the survey followed Marcinko et al. (1986). We surveyed all of the named streams in the basin and collected physical and some social data for all stream sections. We did not evaluate parking or ownership characteristics.

This survey assessed physical, chemical, and biological characteristics at 16 sampling stations (Table 2). We used visual methods to assess physical characteristics and field methods to assess chemical characteristics. Chemical methods involved a mixed indicator for alkalinity, a colorimetric method for pH, and EDTA titration for hardness. We used backpack electrofishing gear to assess biological characteristics. Backpack setups included a Coffelt unit (Model BP 1C, alternating current) and a Smith-Root unit (Model 12-A POW, pulsed direct current) with a single anode and a rat-tail cathode. The choice of backpack electrofishing gear generally depended on station width. In this work we used the Coffelt unit at seven sites and the Smith-Root unit at four sites. Low stream flows prohibited electrofishing operations at five of our sampling stations. We identified the fish we captured at each electrofishing site to species with the exception of sculpins. We only identified sculpins to genus because it was difficult to accurately separate mottled sculpins *Cottus bairdi* from slimy sculpins *Cottus cognatus* in the field. The scientific and common names of the fish species we captured follow Robins et al. (1991).

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 analysis. 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 number and kilograms per hectare using

state average weights. We calculated angler expectation rankings for stream sections according to Moase et al. (1993).

Results and Discussion

The physical and chemical characteristics of the South Branch Towanda Creek basin's tributary streams varied according to the physiographic provinces through which they flowed. Bowman Creek, French Creek, and Beaver Run, which resided in the Glaciated Low Plateau, generally passed through agricultural areas and possessed low to moderate gradients (Table 3). Water quality in these tributaries was fertile, with total alkalinity values ranging from 56 to 68 mg/l and specific conductance values ranging from 92 to 144 umhos (Table 4). In contrast, Fenner, Kent, and Satterlee Runs, which resided in the Glaciated High Plateau, generally passed through forested areas and possessed high gradients. Water quality in these tributaries was infertile, with total alkalinity values ranging from 12 to 16 mg/l and specific conductance values ranging from 33 to 51 umhos. The final named tributary, Ladds Creek, resided on the edge of the Glaciated Low and High Plateaus, and as such possessed intermediate physical and chemical characteristics.

We documented the presence of 21 fish species in the South Branch Towanda Creek basin (Table 5). Blacknose dace *Rhinichthys atratulus* was the most common fish we encountered as we captured this species at 10 of the 11 sites we electrofished (Table 6). The next most common species were creek chubs *Semotilus atromaculatus* (9 sites), longnose dace *Rhinichthys cataractae* (8 sites), and central stonerollers *Campostoma anomalum*, white suckers *Catostomus commersoni*, and sculpins (7 sites each). The gamefish species we captured were brook trout *Salvelinus fontinalis* (4 sites), brown trout (3 sites), and smallmouth bass (1 site). In general, transitional species dominated the fish populations in those tributaries that passed through the Glaciated Low Plateau, while coldwater species dominated the fish populations in those tributaries that passed through the Glaciated High Plateau (Table 6). Wild brook trout were abundant enough at RM 0.84 of Ladds Creek, RM 1.24 of Satterlee Run, and RM 0.83 of Kent Run to conduct population estimates (Table 7).

Historically we had documented the presence of 18 fish species in the South Branch Towanda Creek basin. Those species present historically but absent during the 2001 work were spotfin shiners *Cyprinella spiloptera* and shield darters *Percina peltata*. Those species present during the 2001 work but not documented historically were brook trout, redbreast dace *Clinostomus elongatus*, bluntnose minnows *Pimephales notatus*, greenside darters *Etheostoma blennioides*, and banded darters *Etheostoma zonale*. The presence of greenside and banded darters in the South Branch Towanda Creek basin represented a range expansion for these species.

water quality, fish species occurrence, and wild trout abundance varied among the South Branch Towanda Creek basin streams. We will next 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 (Table 8) needed to generate management plans (PFBC 1987).

South Branch of Towanda Creek

We divided the South Branch of Towanda Creek into three sections for fisheries management purposes. Section 01 extended 13.5 km from the headwaters downstream to the Route 220 bridge near Stevenson. Section 02 extended 7.3 km from the Route 220 bridge downstream to the T-402 bridge near Kellogg. Section 03 extended 4.1 km from the T-402 bridge downstream to the mouth.

Section 01

We sampled at three stations (RM 13.10, RM 9.70, and RM 8.20) in Section 01 and attempted to sample at a fourth but the stream was dry in its headwaters. All three stations were approximately the same as those sampled by Daniels et al. (1978). Total alkalinity at our stations ranged from 36 to 58 mg/l and pH ranged from 7.4 to 7.8. Chemical values in Section 01 were similar to those documented during the historic work except at RM 8.20, where Daniels et al. (1978) documented a pH of 9.0.

We captured 14 species in Section 01 but the gamefish community was limited to a single wild brook trout at RM 9.70. Daniels et al. (1978) captured 14 species in the section including a single hatchery brown trout and a single fingerling smallmouth bass. Those species present in 1978 but absent in 2001 were brown trout, river chub *Nocomis micropogon*, and smallmouth bass. Those species present in 2001 but absent in 1978 were brook trout, redbreast dace, and bluntnose minnows *Pimephales notatus*.

Seasonally warm water temperature was the primary factor limiting wild trout populations in Section 01. The section did not qualify for the statewide trout stocking program because of its poor parking and, in its upstream reaches, intermittent flow. Thus, Natural Yield is the most appropriate management option for Section 01.

Section 02

We sampled at three stations (RM 6.80, RM 3.40, and RM 2.50) in Section 02, all of which were approximately the same as those sampled by Daniels et al. (1978). Total alkalinity at our stations ranged from 50 to 60 mg/l and pH ranged from 7.8 to 8.4. Chemical values in Section 02 were similar to those documented during the historic work.

We captured 18 species in Section 02 but the gamefish community was limited to a single wild brown trout (captured at RM 2.50) and five hatchery brown trout. Daniels et al. (1978) captured 16 species in the section including 7 hatchery brown trout and 16 fingerling smallmouth bass. Those species present in 1978 but absent in 2001 were smallmouth bass and shield darters. Those species present in 2001 but absent in 1978 were spottail shiners *Notropis hudsonius*, bluntnose minnows, greenside darters, and banded darters.

Seasonally warm water temperature was the primary factor limiting wild trout populations in Section 02. The PFBC has managed this section with hatchery trout since 1976 and we recommend that this policy continue to provide a seasonal fishery in the absence of substantial wild trout or warmwater gamefish populations. Beginning with the 2002 season, however, Section 02 will no longer receive an inseason stocking because of cutbacks in PFBC trout production and because of consistently low angler use of this particular inseason plant.

Section 03

We sampled at a single station in Section 03 that was approximately the same as that sampled by Daniels et al. (1978). Total alkalinity at RM 0.70 was 50 mg/l and pH was 8.4. Chemical values at RM 0.70 were similar to those documented during the historic work.

We captured 17 species at RM 0.70 but the gamefish community was limited to a single fingerling smallmouth bass. Daniels et al. (1978) captured 16 species at the station including a single hatchery brown trout and 10 fingerling smallmouth bass. Those species present in 1978 but absent in 2001 were brown trout, spottail shiners, and spotfin shiners *Cyprinella spiloptera*. Those species present in 2001 but absent in 1978 were cutlips minnows, bluntnose minnows, greenside darters, and banded darters.

Section 03 did not possess substantial coldwater or warmwater gamefish populations. Seasonally warm water temperature was the primary factor limiting the development of coldwater gamefish populations. Seasonally low flows in combination with limited physical habitat were the primary factors limiting the development of warmwater gamefish populations. Daniels et al. (1978) recommended against stocking hatchery trout in this section and we recommend that this policy continue. The section will continue to provide limited recreational opportunities for hatchery trout that migrate downstream from Section 02. Thus, Natural Yield is the most appropriate management option for Section 03.

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Satterlee Run

Bowman Creek

Bowman Creek is a 5.9 km long, low gradient tributary to the South Branch of Towanda Creek. Bowman Creek originates from a small wetland area in Wilmot Township and flows generally west through a patchwork of agricultural areas and woodlots. Access to Bowman Creek is very good as 86% of its length is within 300 m of a road.

We sampled at two stations (RM 2.41 and RM 0.22) on Bowman Creek. Total alkalinity at both stations was 56 mg/l and pH ranged from 7.0 to 7.1. Flow was so low throughout the stream that we did not electrofish at either site. Considering its limited fish habitat, Natural Yield is the most appropriate management option for Bowman Creek.

French Creek

French Creek is a 3.0 km long, moderate gradient tributary to the South Branch of Towanda Creek. French Creek originates from the outlet of an unnamed pond in Albany Township and flows generally southwest. Land use in the drainage is primarily agricultural but a greenbelt of trees parallels the lower portion of the stream. Access to French Creek is excellent as 100% of its length is within 300 m of a road.

We sampled at a single station on French Creek. Total alkalinity at RM 0.15 was 62 mg/l and pH was 7.6. We did not electrofish in French Creek because of low stream flow. Considering its limited fish habitat, Natural Yield is the most appropriate management option for French Creek.

Beaver Run

Beaver Run is a 5.4 km long, moderate gradient tributary to the South Branch of Towanda Creek. Beaver Run originates from the outlet of an unnamed pond in Albany Township and flows generally northeast through primarily agricultural lands. Access to Beaver Run is very good as 83% of its length is within 300 m of a road.

We sampled at two stations (RM 2.10 and RM 0.60) on Beaver Run. Total alkalinity at our stations ranged from 63 to 68 mg/l and pH ranged from 7.2 to 7.6. We did not electrofish at RM 2.10 because of low stream flow. At RM 0.60 we captured 7 species in 150 m of electrofishing. Gamefish were absent.

Seasonally warm water temperature was the primary factor limiting wild trout populations in Beaver Run and the stream was too narrow to qualify for the statewide trout stocking program. Thus, the best management option for Beaver Run is Natural Yield.

Ladds Creek

Ladds Creek is a 4.5 km long, moderate gradient tributary to the South Branch of Towanda Creek. Ladds Creek originates at the confluence of two unnamed tributaries in Albany Township and flows generally east. Land use in the drainage is a mixture of woodlots, agricultural areas, and, near the mouth, concentrated residential development in the Borough of New Albany. Access to Ladds Creek is good as 69% of its length is within 300 m of a road.

We sampled at a single station on Ladds Creek. Total alkalinity at RM 0.84 was 38 mg/l and pH was 7.6. Electrofishing efforts at this station produced four fish species including wild brook trout. We captured 85 individual wild brook trout at RM 0.84 ranging from 50 to 199 mm total length (Figure 3). Wild brook trout biomass was 28.20 kg/ha (Class B) but the angler expectation rating was poor. Restricted physical habitat was the primary factor limiting wild brook trout abundance and size distribution in Ladds Creek. Thus, the best management option for this stream is Natural Yield.

Fenner Run

Fenner Run is a 2.3 km long, high gradient tributary to the South Branch of Towanda Creek. Fenner Run originates from springs on the southern slopes of Robwood Mountain and flows generally northwest. Portions of the mostly forested drainage basin lie within the Tioga State Forest. Access to Fenner Run is poor as only 16% of its length is within 300 m of a road.

We sampled at a single station on Fenner Run. Total alkalinity at RM 0.20 was 16 mg/l and pH was 7.0. We did not capture any fish in 150 m of electrofishing at this station. Our Fenner Run station was located at the upstream end of a moderate sized waterfall that fish were unable to ascend. Thus, Fenner Run may have never possessed a fish population or, if it had, fish would have been unable to repopulate the stream following a major environmental disturbance such as a drought. Water quality was acidic in Fenner Run but this would not have prevented fish from populating the stream. Fenner Run was no more acidic than other basin streams where we found substantial fish populations.

Satterlee Run

Satterlee Run is a 7.0 km long, high gradient tributary to the South Branch of Towanda Creek that once served as a municipal water supply. Satterlee Run originates from springs in Monroe Township and flows generally northeast through mostly forested areas. Portions of the drainage lie within SGL 36. Access to Satterlee Run is poor as only 13% of its length is within 300 m of a road.

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Satterlee Run

We sampled at a single station on Satterlee Run. We had hoped to sample at a second site in the headwaters but the only road leading into the area was too rough to travel. Total alkalinity at RM 1.24 was 12 mg/l and pH was 7.0. Electrofishing efforts at this station produced only two fish species: wild brook trout and blacknose dace. We captured 344 individual wild brook trout at RM 1.24 ranging from 25 to 224 mm total length (Figure 3). Wild brook trout biomass was 44.32 kg/ha (Class A) but the angler expectation rating was poor. Because of its Class A wild trout population, the most appropriate management option for Satterlee Run is Wild Trout Waters. Additionally, the DEP should upgrade Satterlee Run's Chapter 93 water quality classification from CWF to high-quality coldwater fishery (HQ-CWF).

Kent Run

Kent Run is a 5.1 km long, high gradient tributary to the South Branch of Towanda Creek. Kent Run originates at the confluence of two unnamed tributaries on Robwood Mountain and flows generally northwest. Forested areas interspersed with vacation homes dominate land use in the drainage. Portions of the drainage lie within SGL 240 and the Tioga State Forest. Access to Kent Run is fair as 35% of its length is within 300 m of a road.

We sampled at a single station on Kent Run that was located at RM 0.83. We had hoped to sample farther upstream in the drainage but the bridge on the only road leading into the headwaters was in an advanced state of disrepair. Total alkalinity at RM 0.83 was 14 mg/l and pH was 7.2. Electrofishing efforts at this station produced only three fish species: brook trout (both wild and stocked), blacknose dace, and creek chubs. We captured 52 individual wild brook trout at RM 0.83 ranging from 50 to 249 mm total length (Figure 3) and two hatchery brook trout measuring between 275 and 299 mm total length. Wild brook trout biomass was 17.91 kg/ha (Class C) and the angler expectation rating was poor.

Several factors combined to limit wild brook trout abundance in Kent Run. Personal observations while passing through the area during the last several years demonstrated that the stream rapidly discolors following a moderate rain because of logging operations in the watershed. In fact, a steep hillside at RM 0.83 showed evidence of recent logging at the time we sampled. Excessive spring flows, as evidenced by heavy erosion high up on the stream banks, have scoured the streambed. Finally, Area Fisheries Technician Minnichbach reported that Kent Run experiences low summer flows (J. Minnichbach, personal communication).

MANAGEMENT RECOMMENDATIONS

1. The Pennsylvania Fish and Boat Commission should continue to stock adult trout in Section 02 of the South Branch of Towanda Creek under the Optimum Yield 2 - Rural program. Stocking rates should be determined according to program guidelines.
2. The Pennsylvania Fish and Boat Commission should manage Sections 01 and 03 of the South Branch of Towanda Creek, Bowman Creek, French Creek, Beaver Run, Ladds Creek, Fenner Run, and Kent Run with conventional, statewide angling regulations under the natural yield option.
3. The Pennsylvania Fish and Boat Commission should manage Satterlee Run with statewide angling regulations under the wild trout waters option. Satterlee Run supported a Class A wild brook trout population.
4. The Pennsylvania Department of Environmental Protection should upgrade the Chapter 93 water quality classification of Satterlee Run from coldwater fishery to high quality coldwater fishery.
5. We request the Bradford County Conservation District to investigate logging related turbidity problems in the Kent Run watershed.

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Table 1. Named streams of the South Branch Towanda Creek basin (404C) listed in hierarchical order.

South Branch Towanda Creek Section 01

Bowman Creek

French Creek

Beaver Run

Ladds Creek

South Branch Towanda Creek Section 02

Fenner Run

Satterlee Run

Kent Run

South Branch Towanda Creek Section 03

Table 2. Station number, river mile, downstream limit, length electrofished, and voltage for stations sampled during July 2001 in the South Branch Towanda Creek basin (404C).

Stream	Station Number	River Mile	Downstream Limit	Length (m)	Volts
South Branch Towanda Creek	0101	13.10	T-379	NA	NA
	0102	9.70	T-382	150	200 DC
	0103	8.20	300 m downstream from SR 2010	150	125 AC
	0201	6.80	300 m downstream from SR 220	150	125 AC
	0202	3.40	Confluence with Satterlee Run	150	125 AC
	0203	2.50	T-402	150	150 AC
	0301	0.70	T-412	150	150 AC
Bowman Creek	0101	2.41	T-379	NA	NA
	0102	0.22	SR 2011	NA	NA
French Creek	0101	0.15	T-382	NA	NA
Beaver Run	0101	2.10	T-374	NA	NA
	0102	0.60	Second bridge upstream from mouth	150	200 DC
Ladds Creek	0101	0.84	150 m downstream from SR 3002	300	200 DC
Fenner Run	0101	0.20	SR 220	150	300 DC
Satterlee Run	0101	1.24	Downstream State Game Lands Boundary	300	250 AC
Kent Run	0101	0.83	Private bridge	302	200 AC

NA = Not Available.

Table 3. Physical and social data for stream sections in the South Branch Towanda Creek basin (404C).

Stream (Section)	Length (km)	Width (m)	Gradient (m/km)	USGS Quadrangle(s)	Road Access			2000 Human Population Density (# Persons/km ²)
					% of Section Within:	500 m	100 m	
South Branch Towanda Creek (01)	13.5	5.5	8.9	F34, F35	30	85	95	12
South Branch Towanda Creek (02)	7.3	7.9	9.7	F34	60	100	100	8
South Branch Towanda Creek (03)	4.1	8.9	9.1	E34, F34	44	100	100	5
Bowman Creek (01)	5.9	NA	12.6	F34, F35	47	86	98	11
French Creek (01)	3.0	NA	30.6	F34	34	100	100	11
Beaver Run (01)	5.4	1.8	18.2	F34	49	83	100	15
Ladds Creek (01)	4.5	2.2	26.0	F34	51	69	98	15
Fenner Run (01)	2.3	2.2	103.9	E34	11	16	28	8
Satterlee Run (01)	7.0	4.1	51.8	E34, F34	5	13	17	5
Kent Run (01)	5.1	3.9	59.6	E34	30	35	44	8

USGS Quadrangles: F34 = Dushore; F35 = Colley; E34 = Monroeton.

NA = Not Available.

Table 4. Physical-chemical data collected at sampling stations in the South Branch Towanda Creek basin (404C) during July 2001.

Stream	River Mile	Date	Time	Air Temp. °C	Water Temp. °C	pH	Total Alkalinity (mg/l)	Total Hardness (mg/l)	Specific Conductance (umhos)
South Branch Towanda Creek	13.10	7/24	1400	34.0	24.2	7.4	36	46	57
	9.70	7/24	1230	35.0	24.0	7.8	54	62	99
	8.20	7/25	0940	28.0	20.3	7.4	58	72	134
	6.80	7/24	1055	32.0	20.5	7.8	60	72	164
	3.40	7/24	0945	28.0	21.1	7.8	50	72	100
	2.50	7/19	1420	30.0	24.2	8.4	50	56	119
	0.70	7/19	1326	30.0	22.0	8.4	50	58	131
Bowman Creek	2.41	7/25	1405	33.0	23.1	7.0	56	64	92
	0.22	7/25	1350	30.0	24.5	7.1	56	68	144
French Creek	0.15	7/24	1325	35.0	20.1	7.6	62	64	136
Beaver Run	2.10	7/25	1330	30.0	22.1	7.2	68	72	134
	0.60	7/25	1245	31.0	21.9	7.6	63	72	98
Ladds Creek	0.84	7/25	1040	34.0	19.3	7.6	38	48	103
Fenner Run	0.20	7/05	1415	26.0	15.5	7.0	16	29	33
Satterlee Run	1.24	7/05	1245	26.0	15.4	7.0	12	16	37
Kent Run	0.83	7/05	1030	24.0	15.4	7.2	14	18	51

Table 5. Scientific and common names of fish species captured in the South Branch Towanda Creek basin (404C) during the 2001 and historic surveys.

Scientific name	Common name	2001	Historic
<i>Salvelinus fontinalis</i>	Brook trout	X	
<i>Salmo trutta</i>	Brown trout	X	X
<i>Campostoma anomalum</i>	Central stoneroller	X	X
<i>Clinostomus elongatus</i>	Redside dace	X	
<i>Exoglossum maxillingua</i>	Cutlips minnow	X	X
<i>Luxilus cornutus</i>	Common shiner	X	X
<i>Notropis hudsonius</i>	Spottail shiner	X	X
<i>Notropis rubellus</i>	Rosyface shiner	X	X
<i>Cyprinella spiloptera</i>	Spotfin shiner		X
<i>Pimephales notatus</i>	Bluntnose minnow	X	
<i>Rhinichthys atratulus</i>	Blacknose dace	X	X
<i>Rhinichthys cataractae</i>	Longnose dace	X	X
<i>Semotilus atromaculatus</i>	Creek chub	X	X
<i>Nocomis micropogon</i>	River chub	X	X
<i>Catostomus commersoni</i>	White sucker	X	X
<i>Hypentelium nigricans</i>	Northern hog sucker	X	X
<i>Noturus insignis</i>	Margined madtom	X	X
<i>Micropterus dolomieu</i>	Smallmouth bass	X	X
<i>Etheostoma olmstedii</i>	Tessellated darter	X	X
<i>Etheostoma blennioides</i>	Greenside darter	X	
<i>Etheostoma zonale</i>	Banded darter	X	
<i>Percina peltata</i>	Shield darter		X
<i>Cottus spp.</i>	Sculpins	X	X

Total Species: 21 18

Table 6. Fish species captured at electrofishing sites in the South Branch Towanda Creek basin (404C) during July 2001.

Common name	South Branch Towanda Creek					Beaver Run RM 0.60	Ladds Creek RM 0.84	Fenner Run RM 0.20	Satterlee Run RM 1.24	Kent Run RM 0.83	Total Sites
	RM 9.70	RM 8.20	RM 6.80	RM 3.40	RM 2.50						
Brook trout	X						X		X	X	4
Brown trout			X	X	X						3
Central stoneroller	X	X	X	X	X	X					7
Redside dace	X	X									3
Cutlips minnow	X	X	X	X	X	X					6
Common shiner	X	X	X	X	X	X					6
Spottail shiner					X						1
Rosyface shiner				X	X	X					2
Bluntnose minnow	X	X	X	X	X	X					4
Blacknose dace	X	X	X	X	X	X	X		X	X	10
Longnose dace	X	X	X	X	X	X	X			X	8
Creek chub	X	X	X	X	X	X	X			X	9
River chub				X	X	X					3
White sucker	X	X	X	X	X	X	X				7
Northern hog sucker	X			X	X	X					3
Margined madtom	X	X	X	X	X	X					6
Smallmouth bass					X	X					1
Tessellated darter		X	X	X	X	X					4
Greenside darter		X	X	X	X	X					4
Banded darter				X	X	X					2
Sculpins	X	X	X	X	X	X					7
Total Species:	13	12	13	12	17	17	4	0	2	3	

RM = River Mile.

Table 7. Estimated population abundance and biomass of wild brook trout captured in Ladds Creek, Satterlee Run, and Kent Run (404C) during July 2001.

Stream (River Mile)	Length Group (mm)	Population Estimate	Number Per Kilometer	Number Per Hectare	Kilograms Per Hectare
Ladds Creek (RM 0.84)	0 - 174	114	381	1,637	25.50
	≥ 175	3	10	43	2.70
	Totals:	117	391	1,680	28.20
Satterlee Run (RM 1.24)	0 - 174	550	1,834	4,585	40.92
	≥ 175	6	20	50	3.40
	Totals:	556	1,854	4,635	44.32
Kent Run (RM 0.83)	0 - 174	56	187	471	12.84
	≥ 175	6	20	50	5.07
	Totals:	62	207	521	17.91

RM = River Mile.

Table 8. 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 stream sections in the South Branch Towanda Creek basin (404C).

Stream (Section)	Current Classification		Recommended DEP Upgrade	Recommended PFBC Management Program	Angler Expectation Rating
	PFBC	DEP			
South Branch Towanda Creek (01)	D R3	CWF	None	Natural Yield	Poor
South Branch Towanda Creek (02)	DGR3	CWF	None	Optimum Yield 2	NA
South Branch Towanda Creek (03)	D R3	CWF	None	Natural Yield	NA
Bowman Creek (01)	D R	CWF	None	Natural Yield	NA
French Creek (01)	D R	CWF	None	Natural Yield	NA
Beaver Run (01)	D R4	CWF	None	Natural Yield	NA
Ladds Creek (01)	B R4	CWF	None	Natural Yield	Poor
Fenner Run (01)	D R4	CWF	None	Natural Yield	NA
Satterlee Run (01)	A R3	CWF	HQ-CWF	Wild Trout	Poor
Kent Run (01)	C R4	CWF	None	Natural Yield	Poor

CWF = Coldwater Fishery; HQ-CWF = High Quality Coldwater Fishery.
 NA = Not Available.

Figure 1. South Branch Towanda Creek drainage basin (404C).

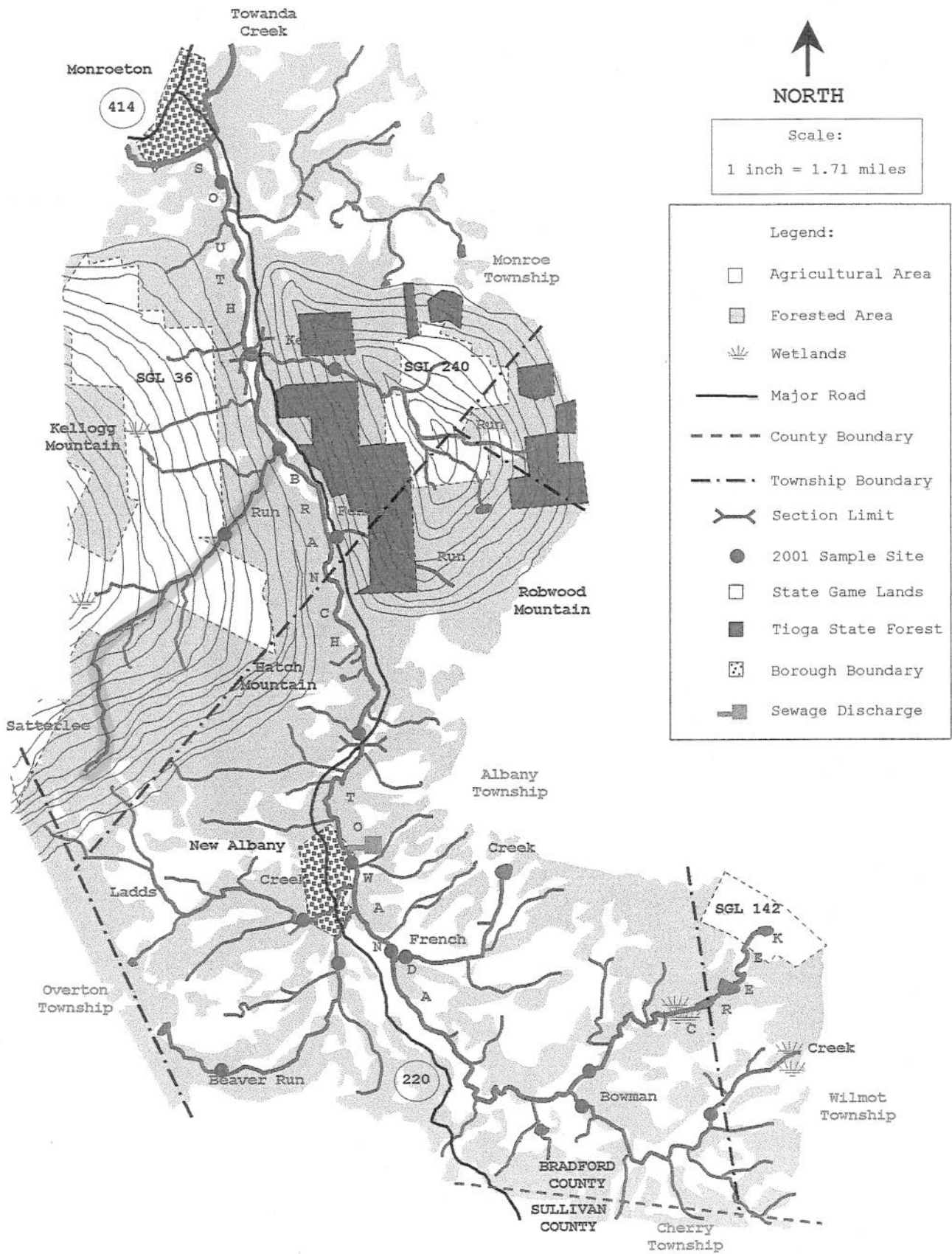


Figure 3. Length-frequency distribution of wild brook trout captured in Ladds Creek, Satterlee Run, and Kent Run during July 2001.

