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DEP Stream Code: 29191

PA FISH AND BOAT COMMISSION
COMMENTS AND RECOMMENDATIONS

Rock Creek

June 1, 2000

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WATER: Selected Tributaries to Tunkhannock Creek (404F) Susquehanna County

EXAMINED: June and August 1999

BY: Moase, Wnuk, and Benzie

Bureau Director Action: Approved - Delano R. [Signature] Date: 6-2-2000
PA Fish & Boat Commission Division of Environmental Services

Division Chief Action: Richard A. Linder - concur Date: 6-2-2000

WW Unit Leader Action: _____ Date: _____

CW Unit Leader Action: R. Thomas Greene Date: 6/1/00

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CW UNIT COMMENTS:

A total of 15 tributary streams to the Tunkhannock Creek (404F) basin were examined during the 1999 field season. Sampling as conducted to update inventory information on Horton Creek and to collect baseline inventory information on the other 14 streams.

Unnamed Tributary (414818 753452)

Section 01 can be characterized as a small, coldwater stream. The 1999 examination recorded the presence of 10 fish species, including an excellent Class A wild brook trout fishery estimated in excess of 42 kg/ha.

Rock Creek

Section 01 can be characterized as a small, headwater stream. The 1999 inventory recorded the presence of five fish species, including an excellent Class A wild brook trout population estimated in excess of 36 kg/ha.

Bear Swamp Creek

This segment can be characterized as a small, freestone stream. The 1999 examination recorded the presence of five nongame fish species.

Bell Creek

Section 01 can be characterized as a small, coldwater stream. The 1999 inventory recorded the presence of four fish species, including a biomass Class D wild brook trout fishery.

Partners Creek

Section 01

This segment can be characterized as a small, freestone stream. Due to low stream flows at the time of sampling, data collection was limited to a water chemistry assessment.

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Section 02

Section 02 can also be characterized as a small, freestone stream. The 1999 inventory recorded the presence of five nongame fish species.

Sterling Brook

This stream was not examined during 1999 due to the presence of a dry stream channel at the time of sampling.

Tower Branch

Section 01 can be characterized as a small, coldwater stream. The 1999 examination recorded the presence of five fish species, including a sparse Class D wild brook trout fishery.

Millard Creek

Section 01 can be characterized as a small, headwater stream. The 1999 inventory recorded the presence of seven fish species, including a biomass Class D wild brook trout fishery.

Willow Brook

This segment can be characterized as a small, coldwater stream. The 1999 examination recorded the presence of eight fish species, including a sparse biomass Class D wild brook trout fishery.

Utley Brook

Section 01 can be characterized as a small headwater stream. The 1999 inventory recorded the presence of six fish species, including a sparse biomass Class D wild brook trout fishery.

Horton Creek

Section 01

Section 01 can be characterized as a small, freestone stream. The 1999 examination (conducted at two sample sites) recorded the presence of 11 nongame fish species. Access limitations and narrow stream width preclude any further consideration for catchable trout management at this time.

Section 02

Section 02 can be characterized as a moderate size, freestone stream. Historically, this segment has been managed with the planting of PFBC catchable trout. The 1999 inventory recorded the presence of 10 fish species, including brook, brown and rainbow trout of hatchery origin.

Field Brook

Section 01 can be characterized as a small, freestone stream. The 1999 examination recorded the presence of seven nongame fish species.

Field Brook, East Branch

This segment can be characterized as a small headwater stream. The 1999 inventory recorded the presence of four nongame fish species.

Monroe Creek

Section 01 can be characterized as a small, coldwater stream. The 1999 examination (conducted at two sample sites) recorded the presence of six fish species, including a sparse biomass Class D wild brook trout fishery.

Swale Brook

This segment can be characterized as a small, headwater stream. The 1999 inventory recorded the presence of four nongame fish species.

CW UNIT RECOMMENDATIONS:

1. Horton Creek (404F), Section 02, should continue to be managed with the planting of PFBC catchable trout. Stocking rate and frequency should be determined by classification according to program guidelines.
2. Rock Creek (404F), Section 01, and the Unnamed Tributary to Tunkhannock Creek, (414818 753452), Section 01, should be managed as Class A wild brook trout fisheries. Conventional statewide regulations should apply with no stocking.
3. Bear Swamp Creek (404F), Section 01; Bell Creek, Section 01; Partners Creek, Section 02; Tower Branch, Section 01; Millard Creek, Section 01; Willow Brook, Section 01; Utley Brook, Section 01; Horton Creek, Section 01; Field Brook, Section 01; Field Brook, East Branch, Section 01; Monroe Creek, Section 01; and Swale Brook, Section 01, should be managed as biomass Class D fisheries under the Natural Yield option. Conventional statewide regulations should apply with no stocking.
4. Due to lack of perennial stream flow no further management action is required for Partners Creek (404F), Section 01, or Sterling Brook, Section 01, at this time.
5. Due to the presence of excellent Class A wild brook trout populations, the DEP Water Quality Standards should be upgraded to HQ-CWF for Rock Creek and the Unnamed Tributary to Tunkhannock Creek (Rm 34.24). The special protected use classification should apply to the entire basins on both waters. A copy of this report should be forwarded to DEP via Environmental Services.

**PENNSYLVANIA FISH AND BOAT COMMISSION
BUREAU OF FISHERIES
FISHERIES MANAGEMENT DIVISION**

**Selected Tributaries to Tunkhannock Creek (404F)
Fisheries Management Report**

Prepared by:
Robert Wnuk, Robert Moase, and Louis Benzie

Sampled: June and August 1999

Prepared: December 1999

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. We selected the Tunkhannock Creek basin for investigation in 1999 because this drainage is relatively large and the fisheries in many of its streams have never been documented. Additionally, the information we had on previously surveyed streams was fairly dated. Thus, the objectives of this examination were: 1) to collect 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

Tunkhannock Creek drains an area of approximately 1,070 km² in Susquehanna, Wyoming, and Lackawanna Counties. There are 41 named streams and numerous unnamed tributaries, farm ponds, wetlands, impoundments, and small glacial lakes in the drainage. We surveyed

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the entire Tunkhannock Creek watershed in 1999 but, because of the size of this basin, we have elected to report our findings as several narratives. This narrative will cover the following streams: Unnamed Tributary to Tunkhannock Creek, Rock Creek, Bear Swamp Creek, Bell Creek, Partners Creek, Sterling Brook, Tower Branch, Millard Creek, Willow Brook, Utley Brook, Horton Creek, Field Brook, East Branch of Field Brook, Monroe Creek, and Swale Brook. With the exception of Horton Creek the PFBC has never previously surveyed any of these streams. Daniels et al. (1976) surveyed Horton Creek as part of the statewide inventory of trout stocked waters.

All of the above streams are located in the Northern Appalachian Plateau and Uplands physiographic province. The topography of this province consists of rolling hills, gentle slopes, and isolated low mountains. Its underlying geology is a mixture of Devonian Age sandstones, siltstones, and shales from the Catskill and Lock Haven Formations (Woods and Omernik 1996). The PFBC manages all of these streams as a single section extending from the headwaters downstream to the mouth with the exceptions of Partners and Horton Creeks (Table 1). The sectioning strategies for Partners and Horton Creeks are as follows:

Partners Creek:

Section 01: From the headwaters downstream to Acre Pond
Section 02: From Acre Pond downstream to the mouth

Horton Creek:

Section 01: From the headwaters downstream to the junction of State Routes 3023 and 2009 near Pine Grove
Section 02: From the junction of State Routes 3023 and 2009 near Pine Grove downstream to the mouth

We manage Section 02 of Horton Creek for adult hatchery trout under the Optimum Yield 2 program, while we manage all of the other streams for their natural fish populations with conventional, statewide angling regulations. The Pennsylvania Department of Environmental Protection (DEP) classifies all of these streams as coldwater fisheries (CWF) in its Chapter 93 water quality standards.

Methods

We examined these Tunkhannock Creek tributaries from June 14 - 25 and August 3 and 4 of 1999. All procedures of the survey were carried out according to Marcinko et al. (1986). We collected physical and some social data for all of these stream sections (Table 1) but did not assess parking or ownership characteristics.

We assessed physical, chemical, and biological characteristics at 26 sampling stations (Table 2). Physical characteristics 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. Biological characteristics were assessed with backpack electrofishing gear. We used a Coffelt backpack electrofisher (Model BP-1C, alternating current) with two electrodes to capture fish at one site 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 16 sites. We did not electrofish at 9 sites because of low stream flow. The scientific and common names of all the fish species we captured 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 ≥ 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 were calculated according to the procedures developed by Moase et al. (1993).

Results and Discussion

All of the Tunkhannock Creek tributaries we cover in this report can be characterized as moderately fertile and possessing sufficient buffering capacity against the effects of acid precipitation. According to the criteria established by Johnson (1983) streams become vulnerable to acid precipitation when total alkalinity drops below 10 mg/l. Total alkalinity values in these tributaries, however, ranged from 25 to 94 mg/l during our 1999 work (Table 3). This fertility resulted from a combination of the underlying geology and the agricultural nature of the Tunkhannock Creek basin.

We documented the presence of 18 fish species in these tributaries (Table 4). Brook trout were the dominant gamefish as we captured this species at ten of the seventeen sites we electrofished (Tables 5 and 6). We captured brown trout at two of the sites and rainbow trout at one. Wild brook trout numbers (Table 7) and biomass (Table 8) were sufficient to achieve Class A status in two of the streams.

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

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facilitate presenting the resource classifications (Table 9) needed to generate management plans (PFBC 1987).

Unnamed Tributary (414818 753452)

The unnamed tributary is a 2.1 km long, moderate gradient stream that originates at the confluence of two unnamed tributaries in Gibson Township, Susquehanna County. The unnamed tributary flows generally southwest through a mixture of agricultural areas and woodlots to its confluence with Tunkhannock Creek at RM 34.24, 41°48'18" Latitude and 75°34'52" Longitude, near Gellat (Figure 1). There are several unnamed ponds and wetlands in the drainage and the southeastern portion of the basin is contained within State Game Lands # 236.

We sampled at a single station on the unnamed tributary. Total alkalinity at RM 0.13 was 46 mg/l and pH was 8.4. We documented ten fish species at the station and the gamefish community was composed of wild brook and brown trout. We captured a total of 279 wild brook trout and 9 wild brown trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 42.32 kg/ha (Class A) with fish ranging from 50 to 274 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 the unnamed tributary. The DEP classification of CWF, however, did not provide sufficient water quality protection. The unnamed tributary should be upgraded to high quality coldwater fishery (HQ-CWF) because it supported a Class A wild trout population.

Rock Creek

Rock Creek is a 4.3 km long, moderate gradient stream that originates at the confluence of two unnamed tributaries in Ararat Township, Susquehanna County. Rock Creek flows generally southwest through a mixture of agricultural areas and woodlots to its confluence with Tunkhannock Creek near Smiley (Figure 2). Willis Lake and several unnamed ponds and wetlands are contained within the Rock Creek drainage. Access to Rock Creek is good as 54% of its length is within 300 m of a road.

We sampled at a single station on Rock Creek. Total alkalinity at RM 1.03 was 39 mg/l and pH was 7.4. We documented 5 fish species at the station but wild brook trout were the only gamefish present. We captured a total of 79 wild brook trout in 300 m of electrofishing. Wild brook trout biomass was estimated at 36.27 kg/ha (Class A) with fish ranging from 50 to 249 mm. The angler expectation rating was good.

Statewide angling regulations were adequate to protect and manage the fishery in Rock Creek. The DEP classification of CWF, however, did not provide sufficient water quality protection. Rock Creek

should be upgraded to HQ-CWF because it supported a Class A wild trout population.

Bear Swamp Creek

Bear Swamp Creek is a 5.1 km long, moderate gradient stream that originates on East Mountain in Gibson Township, Susquehanna County. Bear Swamp Creek flows generally southwest through a mixture of agricultural areas and woodlots to its confluence with Tunkhannock Creek near South Gibson (Figure 3). The Bear Swamp Creek drainage contains several unnamed ponds and Bear Swamp. Access to Bear Swamp Creek is excellent as 91% of its length is within 300 m of a road.

We sampled at two stations (RM 4.11 and RM 0.79) on Bear Swamp Creek. Total alkalinity at our stations ranged from 39 to 41 mg/l and pH ranged from 7.2 to 7.4. We were unable to electrofish at RM 4.11 because of low stream flow. At RM 0.79 we documented five fish species in 150 m of electrofishing but gamefish were absent.

Bear Swamp Creek was too narrow to qualify for the statewide trout stocking program. Thus, this small stream should be managed for the limited amount of angling that its natural fish populations are able to provide with statewide angling regulations. The DEP classification of CWF provided sufficient water quality protection.

Bell Creek

Bell Creek is a 6.2 km long, moderate gradient stream that originates from the outlet of an unnamed pond in Gibson Township, Susquehanna County. Bell Creek flows generally south through a mixture of agricultural areas and woodlots to its confluence with Tunkhannock Creek near South Gibson (Figure 4). The Bell Creek drainage contains Potter Lake and several unnamed ponds and wetlands. Access to Bell Creek is very good as 82% of its length is within 300 m of a road.

We sampled at two stations (RM 3.14 and RM 0.70) on Bell Creek. Total alkalinity at our stations ranged from 26 to 31 mg/l and pH ranged from 6.4 to 7.4. We were unable to electrofish at RM 3.14 because of low stream flow. At RM 0.70 we documented four fish species but wild brook trout were the only gamefish present. We captured a total of 7 wild brook trout in 150 m of electrofishing. Wild brook trout biomass was estimated at 7.96 kg/ha (Class D) with fish ranging from 50 to 224 mm. The angler expectation rating was poor.

Bell Creek was too narrow to qualify for the statewide trout stocking program. Thus, this small stream should be managed for the limited amount of angling that its natural fish populations are able to provide with statewide angling regulations. The DEP classification of CWF provided sufficient water quality protection.

Partners Creek is a 8.1 km long, low to moderate gradient stream that originates from the outlet of an unnamed pond in Harford Township, Susquehanna County. Partners Creek flows generally south through a mixture of agricultural areas and woodlots to its confluence with Tunkhannock Creek in Lenox Township (Figure 5). The Partners Creek drainage contains Acre Pond, Sterling Brook, and several unnamed ponds and wetlands. We divided Partners Creek into two sections for fisheries management purposes.

Section 01

Section 01 of Partners Creek extended 3.9 km from the headwaters downstream to Acre Pond. Access to the section was excellent as 91% of its length was within 300 m of a road.

We sampled at a single station in Section 01. Total alkalinity at RM 4.26 was 25 mg/l and pH was 7.0. We were unable to electrofish in Section 01 because of low stream flow.

Section 02

Section 02 of Partners Creek extended 4.2 km from Acre Pond downstream to the mouth. Access to the section was excellent as 100% of its length was within 300 m of a road.

We sampled at a single station in Section 02. Total alkalinity at RM 0.02 was 34 mg/l and pH was 7.5. We captured five fish species in 150 m of electrofishing at the station but gamefish were absent.

Section 02 was too narrow to qualify for the statewide trout stocking program. Thus, this section should be managed for the limited amount of angling that its natural fish populations are able to provide with statewide angling regulations. The DEP classification of CWF provided sufficient water quality protection.

Sterling Brook

Sterling Brook is a 2.1 km long, moderate gradient stream that originates from the outlet of an unnamed pond in Lenox Township, Susquehanna County. Sterling Brook flows generally south through a mixture of agricultural areas and woodlots to its confluence with Partners Creek downstream from Acre Pond (Figure 5). Sterling Brook was completely dry when we examined it on June 24, 1999.

Tower Branch

Tower Branch is a 6.6 km long, moderate gradient stream that originates from wetlands in Harford and Lenox Townships in Susquehanna County. Tower Branch flows generally south through a mixture of agricultural areas and woodlots to its confluence with Tunkhannock Creek (Figure 5). The Tower Branch drainage contains

several unnamed ponds and wetlands. Access to Tower Branch is good as 50% of its length is within 300 m of a road.

We sampled at two stations (RM 3.39 and RM 0.07) on Tower Branch. Total alkalinity at our stations ranged from 35 to 41 mg/l and pH ranged from 7.0 to 7.4. We were unable to electrofish at RM 3.39 because of low stream flow. At RM 0.07 we documented five fish species but wild brook trout were the only gamefish present. We captured a total of 4 wild brook trout in 150 m of electrofishing. Wild brook trout biomass was estimated at 5.61 kg/ha (Class D) with fish ranging from 50 to 249 mm. The angler expectation rating was poor.

Tower Branch was too narrow to qualify for the statewide trout stocking program. Thus, this small stream should be managed for the limited amount of angling that its natural fish populations are able to provide with statewide angling regulations. The DEP classification of CWF provided sufficient water quality protection.

Millard Creek

Millard Creek is a 4.3 km long, moderate gradient stream that originates from the outlet of Jeffers Pond in Lenox Township, Susquehanna County. Millard Creek flows generally south through a mixture of agricultural areas and woodlots to its confluence with Tunkhannock Creek (Figure 6). The Millard Creek drainage contains Loomis Lake, Jeffers Pond, and several unnamed ponds and wetlands. Access to Millard Creek is good as 70% of its length is within 300 m of a road.

We sampled at a single station on Millard Creek. Total alkalinity at RM 0.99 was 41 mg/l and pH was 7.4. We documented seven fish species at the station but wild brook trout were the only gamefish present. We captured a total of 10 wild brook trout in 150 m of electrofishing. Wild brook trout biomass was estimated at 5.52 kg/ha with fish ranging from 25 to 224 mm. The angler expectation rating was poor.

Millard Creek was too narrow to qualify for the statewide trout stocking program. Thus, this small stream should continue to be managed for the limited amount of angling that its natural fish populations are able to provide with statewide angling regulations. The DEP classification of CWF provided sufficient water quality protection.

Willow Brook

Willow Brook is a 6.0 km long, moderate gradient stream that originates from the outlet of Clark Pond in Lenox Township, Susquehanna County. Willow Brook flows generally south through a mixture of agricultural areas and woodlots to its confluence with Tunkhannock Creek in Nicholson Township, Wyoming County (Figure 6). The Willow Brook drainage contains Utley Brook, Clark Pond, and

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several unnamed ponds and wetlands. Access to Willow Brook is excellent as 93% of its length is within 300 m of a road.

We sampled at two stations (RM 3.12 and RM 0.56) on Willow Brook. Total alkalinity at our stations ranged from 43 to 64 mg/l and pH ranged from 7.2 to 7.4. We were unable to electrofish at RM 3.12 because of low stream flow. At RM 0.56 we documented eight fish species but wild brook trout were the only gamefish present. We captured a single wild brook trout measuring between 50 and 74 mm in 150 m of electrofishing.

Willow Brook was too narrow to qualify for the statewide trout stocking program. Thus, this small stream should be managed for the limited amount of angling that its natural fish populations are able to provide with statewide angling regulations. The DEP classification of CWF provided sufficient water quality protection.

Utley Brook

Utley Brook is a 6.0 km long, moderate gradient stream that originates from wetlands in Lenox Township, Susquehanna County. Utley Brook flows generally south through a mixture of agricultural areas and woodlots to its confluence with Willow Brook in Nicholson Township, Wyoming County. The Utley Brook drainage contains several unnamed ponds and wetlands. Access to Utley Brook is good as 74% of its length is within 300 m of a road.

We sampled at a single station on Utley Brook and attempted to sample at a second but the stream was dry in its headwaters. Total alkalinity at RM 0.00 was 41 mg/l and pH was 7.4. We documented six fish species at the station but wild brook trout were the only gamefish present. We captured a total of 3 wild brook trout in 150 m of electrofishing. Wild brook trout biomass was estimated at 6.30 kg/ha with fish measuring between 175 and 199 mm. The angler expectation rating was poor.

Utley Brook was too narrow to qualify for the statewide trout stocking program. Thus, this small stream should be managed for the limited amount of angling that its natural fish populations are able to provide with statewide angling regulations. The DEP classification of CWF provided sufficient water quality protection.

Horton Creek

Horton Creek is a 16.8 km long, low gradient stream that originates in Brooklyn Township, Susquehanna County. Horton Creek flows generally south through a mixture of agricultural areas and woodlots to its confluence with Tunkhannock Creek within the borough of Nicholson in Wyoming County (Figure 7). The Horton Creek drainage contains Lord Pond, Mud Pond, Lakeside Pond, Kinney Swamp, and several unnamed ponds and wetlands. We divided Horton Creek into two sections for fisheries management purposes.

Section 01

Section 01 of Horton Creek extended 12.0 km from the headwaters downstream to the junction of State Routes 3023 and 2009 near Pine Grove. Access to the section was good as 68% of its length was within 300 m of a road.

We sampled at three stations (RM 11.08, RM 7.97, and RM 5.67) in Section 01. Daniels et al. (1976) sampled at RM 6.70 and RM 4.80. Total alkalinity at our stations ranged from 36 to 44 mg/l and pH ranged from 6.7 to 7.4. These values were similar to those documented in the section by Daniels et al. (1976).

We were unable to electrofish at RM 11.08 because of low stream flow. At the other two stations we documented 11 fish species but gamefish were absent. Daniels et al. (1976) documented 16 fish species in the section. Chain pickerel (*Esox niger*), fallfish (*Semotilus corporalis*), river chubs, northern hog suckers (*Hypentelium nigricans*), and bluegills (*Lepomis macrochirus*) were present in 1976 but absent in 1999. All of the species we collected in 1999 were present in 1976.

Section 01 of Horton Creek was too narrow throughout most of its length to qualify for the statewide trout stocking program. Additionally, Daniels et al. (1976) reported that the section was completely posted against trespassing and that vertical banks in many areas would limit angler access. Thus, this section should be managed for the limited amount of angling that its natural fish populations are able to provide with statewide angling regulations. The DEP classification of CWF provided sufficient water quality protection.

Section 02

Section 02 of Horton Creek extended 4.8 km from the junction of State Routes 3023 and 2009 near Pine Grove downstream to the mouth. Access to the section was excellent as 100% of its length was within 300 m of a road.

We sampled at a single station (RM 0.89) in Section 02. Daniels et al. (1976) sampled at RM 2.30 and RM 0.60. Total alkalinity at RM 0.89 was 44 mg/l and pH was 7.4. These values were similar to those documented in the section by Daniels et al. (1976).

We documented 10 fish species at RM 0.89 but the gamefish community was limited to holdover stocked trout. Daniels et al. (1976) captured 19 species in the section. Common shiners, spotfin shiners (*Cyprinella spiloptera*), bluntnose minnows (*Pimephales notatus*), fallfish, river chubs, northern hog suckers, margined madtoms, redbreast sunfish (*Lepomis auritus*), pumpkinseeds, largemouth bass (*Micropterus salmoides*), and tessellated darters were present in 1976 but absent in 1999. Conversely, rainbow and brown trout were present in 1999 but absent in 1976.

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Section 02 of Horton Creek is currently stocked with adult trout under the Optimum Yield 2 - Rural program. The natural fish populations in this section could not support an acceptable recreational fishery in the absence of trout stocking. Thus, this section should continue to be stocked with hatchery trout. The DEP classification of CWF provided sufficient water quality protection.

Field Brook

Field Brook is an 8.4 km long, moderate gradient stream that originates from an unnamed pond in Lathrop Township, Susquehanna County. Field Brook flows generally southeast through a mixture of agricultural areas and woodlots to its confluence with Tunkhannock Creek in Nicholson Township, Wyoming County (Figure 7). The Field Brook drainage contains the East Branch of Field Brook, Cord Pond, and several unnamed ponds and wetlands. Access to Field Brook is good as 72% of its length is within 300 m of a road.

We sampled at two stations (RM 4.61 and RM 0.52) on Field Brook. Total alkalinity at our stations ranged from 49 to 94 mg/l and pH ranged from 7.3 to 7.5. We were unable to electrofish at RM 4.61 because of low stream flow. At RM 0.52 we documented seven fish species in 150 m of electrofishing but gamefish were absent.

Field Brook was too narrow to qualify for the statewide trout stocking program. Thus, this small stream should be managed for the limited amount of angling that its natural fish populations are able to provide under statewide angling regulations. The DEP classification of CWF provided sufficient water quality protection.

East Branch of Field Brook

The East Branch of Field Brook is a 5.6 km long, moderate gradient stream that originates from the outlet of an unnamed pond in Lathrop Township, Susquehanna County. The East Branch of Field Brook flows generally south through a mixture of agricultural areas and woodlots to its confluence with Field Brook in Nicholson Township, Wyoming County (Figure 7). The East Branch Field Brook drainage contains several unnamed ponds and wetlands. Access to the East Branch of Field Brook is good as 64% of its length is within 300 m of a road.

We sampled at two stations (RM 3.02 and RM 0.00) on the East Branch of Field Brook. Total alkalinity at our stations ranged from 42 to 60 mg/l and pH ranged from 7.4 to 7.5. We were unable to electrofish at RM 3.02 because of low stream flow. At RM 0.00 we documented four fish species in 90 m of electrofishing but gamefish were absent.

The East Branch of Field Brook was too narrow to qualify for the statewide trout stocking program. Thus, this small stream should be managed for the limited amount of angling that its natural fish

populations are able to provide with statewide angling regulations. The DEP classification of CWF provided sufficient water quality protection.

Monroe Creek

Monroe Creek is a 9.5 km long, moderate gradient stream that originates in Springville Township, Susquehanna County. Monroe Creek flows generally south through a mixture of agricultural areas and woodlots to its confluence with Tunkhannock Creek in Nicholson Township, Wyoming County (Figure 7). The Monroe Creek drainage contains Phelps Swamp and numerous small wetlands. Access to Monroe Creek is good as 67% of its length is within 300 m of a road.

We sampled at three stations (RM 4.75, RM 2.67, and RM 1.04) on Monroe Creek. Total alkalinity at our stations ranged from 45 to 60 mg/l and pH ranged from 6.4 to 7.2. We were unable to electrofish at RM 4.75 because of low stream flow. At the other two stations we documented a total of six fish species but wild brook trout were the only gamefish present. We captured a single wild brook trout measuring between 250 and 274 mm in 210 m of electrofishing at RM 2.67. At RM 1.04 we captured a single wild brook trout measuring between 175 and 199 mm in 150 m of electrofishing.

Monroe Creek was too narrow to qualify for the statewide trout stocking program. Thus, this small stream should be managed for the limited amount of angling that its natural fish populations are able to provide with statewide angling regulations. The DEP classification of CWF provided sufficient water quality protection.

Swale Brook

Swale Brook is a 4.6 km long, moderate gradient stream that originates from the outlet of Cruver Pond. Swale Brook flows generally southeast through suburban areas in and around the borough of Tunkhannock to its confluence with Tunkhannock Creek (Figure 8). The Swale Brook drainage contains two unnamed tributaries, Cruver Pond, and one unnamed pond. Access to Swale Brook is excellent as 93% of its length is within 300 m of a road.

We sampled at a single station on Swale Brook and attempted to sample at a second but the stream was dry in its headwaters. Total alkalinity at RM 0.64 was 70 mg/l and pH was 7.4. We captured four fish species in 150 m of electrofishing at RM 0.64 but gamefish were absent.

Swale Brook was too narrow to qualify for the statewide trout stocking program. Thus, this small stream should be managed for the limited amount of angling that its natural fish populations are able to provide with statewide angling regulations. The DEP classification of CWF provided sufficient water quality protection.

MANAGEMENT RECOMMENDATIONS

- 1) The Pennsylvania Fish and Boat Commission should continue to stock Section 02 of Horton Creek with adult trout to provide seasonal angling opportunities.
- 2) The Pennsylvania Fish and Boat Commission should manage Rock Creek and the unnamed tributary to Tunkhannock Creek at River Mile 34.24 with statewide angling regulations under the wild trout waters option. These streams supported Class A wild brook trout populations.
- 3) The Pennsylvania Fish and Boat Commission should manage the following streams under the natural yield option with statewide angling regulations and no trout stocking:

Bear Swamp Creek
Bell Creek
Partners Creek Section 01
Partners Creek Section 02
Sterling Brook
Tower Branch
Millard Creek

Willow Brook
Utley Brook
Horton Creek Section 01
Field Brook
East Branch of Field Brook
Monroe Creek
Swale Brook

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

- 4) The Pennsylvania Department of Environmental Protection should upgrade the Chapter 93 water quality classifications for Rock Creek and the unnamed tributary to Tunkhannock Creek at River Mile 34.24 from coldwater fishery to high quality coldwater fishery.

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Table 1. Physical and social data for selected stream sections in the Tunkhannock Creek basin (404F).

Stream (Section)	Length Width Gradient (km) (m) (m/km)		USGS Quadrangle(s)	Proximity to roads: % of Section within			1990 Human Population Density (#Persons/km ²)
				100m	300m	500m	
Unnamed Tributary (01)	2.1	4.4	17.4	D41	NA	NA	NA
Rock Creek (01)	4.3	2.6	47.1	D41	36	54	99
Bear Swamp Creek (01)	5.1	3.4	46.3	E40, E41	54	91	93
Bell Creek (01)	6.2	3.3	22.0	D40, D41, E40	37	82	100
Partners Creek (01)	3.9	NA	4.6	E40	23	91	100
Partners Creek (02)	4.2	3.2	26.4	E40	59	100	100
Sterling Brook (01)	2.1	NA	32.4	E40	19	74	100
Tower Branch (01)	6.6	2.7	25.5	E40	19	50	72
Millard Creek (01)	4.3	2.7	22.8	E40	57	70	100
Willow Brook (01)	6.0	1.9	27.1	E39, E40	72	93	100
Utley Brook (01)	6.0	1.7	21.9	E39, E40	43	74	96
Horton Creek (01)	12.0	3.6	11.3	E39	7	68	100
Horton Creek (02)	4.8	6.0	6.5	E39, F39	88	100	100
Field Brook (01)	8.4	5.0	18.5	E39, F39	52	72	93
E Br Field Brook (01)	5.6	2.0	20.9	E39	33	64	95
Monroe Creek (01)	9.5	3.8	20.9	E39, F39	38	67	90
Swale Brook (01)	4.6	1.5	29.3	F38	49	93	100

USGS Quadrangles: D40 = Harford; D41 = Thompson; E39 = Hop Bottom; E40 = Lenoxville; E41 = Clifford;
F38 = Tunkhannock; F39 = Factoryville.

NA = Not Available.

Table 2. Station number, river mile, downstream limit, length electrofished, and voltage for stations sampled during 1999 in selected tributaries to Tunkhannock Creek (404F).

Stream	Station Number	River Mile	Downstream Limit	Length (m)	Volts
Unnamed Tributary	0101	0.13	150 m downstream from SR 2046	300	200 DC
Rock Creek	0101	1.03	300 m upst jct T 505/SR 2036	300	400 DC
Bear Swamp Creek	0101	4.11	SR 2069	NA	NA
	0102	0.79	T 446	150	400 DC
Bell Creek	0101	3.14	SR 2067	NA	NA
	0102	0.70	First bridge upstream from the mouth	150	400 DC
Partners Creek	0101	4.26	T 576	NA	NA
	0201	0.02	150 m downstream from SR 92	150	400 DC
Tower Branch	0101	3.39	SR 2020	NA	NA
	0102	0.07	150 m downstream from SR 92	150	400 DC
Millard Creek	0101	0.99	300 m downstream from SR 2043	150	400 DC
Willow Brook	0101	3.12	SR 2019	NA	NA
	0102	0.56	Confluence with Utley Brook	150	400 DC
Utley Brook	0101	0.00	Mouth	150	400 DC
Horton Creek	0101	11.08	SR 2015	NA	NA
	0102	7.97	SR 2096	150	200 DC
	0103	5.67	SR 2002 in Hillside	150	200 DC
	0201	0.89	Pulloff along SR 1017	150	200 AC

Continued on next page.

Table 2. Continued.

Stream	Station Number	River Mile	Downstream Limit	Length (m)	Volts
Field Brook	0101	4.61	SR 2002 east of Mulligan Hill	NA	NA
	0102	0.52	250 m upstream from SR 92	150	300 DC
E Br Field Brook	0101	3.02	SR 2002	NA	NA
	0102	0.00	Mouth	90	200 DC
Monroe Creek	0101	4.75	T 351	NA	NA
	0102	2.67	300 m downstream from T 517	210	300 DC
	0103	1.04	300 m downstream from T 536	150	300 DC
Swale Brook	0101	0.64	SR 29	150	200 DC

Table 3. Physical-chemical data collected at sampling stations in selected tributaries to Tunkhannock Creek (404F) 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	0.13	8/03	1515	27.0	19.0	8.4	46	52	136
Rock Creek	1.03	6/23	1545	27.0	15.4	7.4	39	47	123
Bear Swamp Creek	4.11	6/23	1330	29.0	18.6	7.2	39	49	120
	0.79	6/23	1420	29.0	21.1	7.4	41	55	142
Bell Creek	3.14	6/22	1450	28.0	13.7	6.4	26	38	107
	0.70	6/23	1215	26.0	16.0	7.4	31	41	115
Partners Creek	4.26	6/24	1110	25.0	19.3	7.0	25	35	100
	0.02	6/24	1200	29.0	20.9	7.5	34	44	128
Tower Branch	3.39	6/24	1345	30.0	16.9	7.0	35	47	139
	0.07	6/24	1325	30.0	18.6	7.4	41	49	128
Millard Creek	0.99	6/24	1450	30.0	18.1	7.4	41	57	145
Willow Brook	3.12	6/24	1515	30.0	19.8	7.2	64	74	182
	0.56	6/25	1035	24.0	15.3	7.4	43	49	126
Utley Brook	0.00	6/25	1040	24.0	15.0	7.4	41	55	151
Horton Creek	11.08	6/14	1410	26.0	18.9	6.7	40	50	127
	7.97	6/14	1325	27.0	18.6	7.2	44	48	126
	5.67	6/14	1230	25.0	19.8	7.4	36	44	134
	0.89	6/14	1100	26.0	18.4	7.4	44	54	158

Continued on next page.

Table 3. Continued.

Stream	River Mile	Date	Time	Air Temp. °C	Water Temp. °C	pH	Total Alkalinity (mg/l)	Total Hardness (mg/l)	Specific Conductance (umhos)
Field Brook	4.61	6/18	1342	23.0	18.4	7.3	94	94	252
	0.52	6/18	1320	25.0	15.4	7.5	49	64	182
East Branch of Field Brook	3.02	6/14	1440	27.0	22.5	7.5	42	47	121
	0.00	6/14	1500	29.0	20.9	7.4	60	75	190
Monroe Creek	4.75	6/17	1500	15.0	13.0	7.2	60	92	240
	2.67	6/17	1450	15.0	14.3	6.4	45	58	189
	1.04	6/17	1300	15.0	13.4	7.2	46	58	160
Swale Brook	0.64	6/16	0925	17.0	13.6	7.4	70	104	333

Table 4. Scientific and common names of fish species captured in selected tributaries to Tunkhannock Creek (404F) during 1999.

Scientific name	Common name
<i>Oncorhynchus mykiss</i>	Rainbow trout
<i>Salmo trutta</i>	Brown trout
<i>Salvelinus fontinalis</i>	Brook trout
<i>Campostoma anomalum</i>	Central stoneroller
<i>Exoglossum maxillingua</i>	Cutlips minnow
<i>Notemigonus crysoleucas</i>	Golden shiner
<i>Luxilus cornutus</i>	Common shiner
<i>Notropis procne</i>	Swallowtail shiner
<i>Rhinichthys atratulus</i>	Blacknose dace
<i>Rhinichthys cataractae</i>	Longnose dace
<i>Semotilus atromaculatus</i>	Creek chub
<i>Nocomis micropogon</i>	River chub
<i>Catostomus commersoni</i>	White sucker
<i>Noturus insignis</i>	Margined madtom
<i>Lepomis cyanellus</i>	Green sunfish
<i>Lepomis gibbosus</i>	Pumpkinseed
<i>Etheostoma olmstedii</i>	Tessellated darter
<i>Cottus spp.</i>	Sculpins

Total Species: 18

Table 5. Fish species captured at electrofishing sites in selected tributaries to Tunkhannock Creek (404F) during 1999.

Common name	Unnamed Tributary RM 0.13	Rock Creek RM 1.03	Bear Swamp Creek RM 0.79	Bell Creek RM 0.70	Partners Creek RM 0.02	Tower Branch RM 0.07	Millard Creek RM 0.99	Willow Brook RM 0.56	Utley Brook RM 0.00
Brown trout	X								
Brook trout	X	X		X		X	X	X	X
Central stoneroller					X				
Cutlips minnow	X		X		X		X	X	X
Swallowtail shiner	X								
Blacknose dace	X	X	X	X	X	X	X	X	X
Longnose dace	X	X	X		X	X	X	X	X
Creek chub	X	X	X	X		X	X	X	X
River chub	X								
White sucker							X		
Green sunfish								X	
Pumpkinseed				X					
Tessellated darter	X								
Sculpins	X	X	X		X	X	X	X	X

Total Species:

10

5

5

4

5

5

7

8

6

Table 6. Fish species captured at electrofishing sites in selected tributaries to Tunkhannock Creek (404F) during 1999.

Common name	Horton Creek RM 7.97	Horton Creek RM 5.67	Horton Creek RM 0.89	Field Brook RM 0.52	East Branch Field Brook RM 0.00	Monroe Creek RM 2.67	Monroe Creek RM 1.04	Swale Brook RM 0.64
Rainbow trout			X					
Brown trout			X					
Brook trout			X			X	X	
Central stoneroller	X	X	X	X	X	X		X
Cutlips minnow	X	X	X					
Golden shiner				X				
Common shiner	X	X						
Blacknose dace	X	X	X	X	X	X	X	X
Longnose dace	X	X	X	X	X			
Creek chub	X	X	X	X	X	X	X	X
White sucker	X	X	X			X		X
Margined madtom	X	X						
Pumpkinseed	X	X		X		X		
Tessellated darter	X							
Sculpins	X	X	X	X				
Total Species:	11	10	10	7	4	6	3	4

Table 7. Length-frequency distribution ((M+C)-R) of wild trout captured at electrofishing sites in selected tributaries to Tunkhannock Creek (404F) during 1999.

Stream	River Mile	Species	25	50	75	100	125	150	175	200	225	250	275	300	Total
Unnamed Tributary	0.13	Brook Brown	120 4	86 3	12	20	16	10	11	3	1			2	279 9
Rock Creek	1.03	Brook	31			12	21	4	8	3					79
Bell Creek	0.70	Brook	1				3		3						7
Tower Branch	0.07	Brook	2						1	1					4
Millard Creek	0.99	Brook	1	5		1	1	1	1						10
Willow Brook	0.56	Brook	1												1
Utley Brook	0.00	Brook						3		3					3
Monroe Creek	2.67	Brook										1			1
	1.04	Brook							1						1

Table 8. Estimated population abundance and biomass of wild trout in selected tributaries to Tunkhannock Creek (404F) during 1999.

Stream (Section)	Species	Number/Kilometer		Number/Hectare		Kilograms/Hectare	
		< 175 mm	≥ 175 mm	< 175 mm	≥ 175 mm	< 175 mm	≥ 175 mm
Unnamed Tributary (01)	Brook	1,261	105	2,907	243	21.35	20.97
	Brown	23	7	54	15	0.23	4.71
						Total:	47.26
Rock Creek (01)	Brook	275	53	1,033	200	17.57	18.70
Bell Creek (01)	Brook	27	20	80	60	2.50	5.46
Tower Branch (01)	Brook	13	14	50	50	0.10	5.51
Millard Creek (01)	Brook	54	14	200	50	1.66	3.86
Willow Brook (01)	Brook	7	0	33	0	0.07	0.00
Utle Brook (01)	Brook	0	20	0	100	0.00	6.30
Monroe Creek (01)	Brook	0	5	0	15	0.00	1.94

Table 9. 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 selected tributaries to Tunkhannock Creek (404F).

Stream (Section)	Classification		Recommended DEP Upgrade	Recommended PFBC Management Program	Angler Expectation Rating
	PFBC	DEP			
Unnamed Tributary (01)	A R3	CWF	HQ-CWF	Wild Trout Waters	Good
Rock Creek (01)	A R4	CWF	HQ-CWF	Wild Trout Waters	Good
Bear Swamp Creek (01)	D R4	CWF	None	Natural Yield	Poor
Bell Creek (01)	D R4	CWF	None	Natural Yield	Poor
Partners Creek (01)	R	CWF	None	Natural Yield	NA
Partners Creek (02)	D R4	CWF	None	Natural Yield	Poor
Sterling Brook (01)	R	CWF	None	Natural Yield	NA
Tower Branch (01)	D R4	CWF	None	Natural Yield	Poor
Millard Creek (01)	D R4	CWF	None	Natural Yield	Poor
Willow Brook (01)	D R4	CWF	None	Natural Yield	Poor
Utley Brook (01)	D R4	CWF	None	Natural Yield	Poor
Horton Creek (01)	D R3	CWF	None	Natural Yield	Poor
Horton Creek (02)	DGR3	CWF	None	Optimum Yield 2	Poor

Continued on next page.

Table 9. Continued.

Stream (Section)	Classification		Recommended DEP Upgrade	Recommended PFBC Management Program	Angler Expectation Rating
	PFBC	DEP			
Field Brook (01)	D R4	CWF	None	Natural Yield	Poor
E Br Field Brook (01)	D R4	CWF	None	Natural Yield	Poor
Monroe Creek (01)	D R4	CWF	None	Natural Yield	Poor
Swale Brook (01)	D R4	CWF	None	Natural Yield	Poor

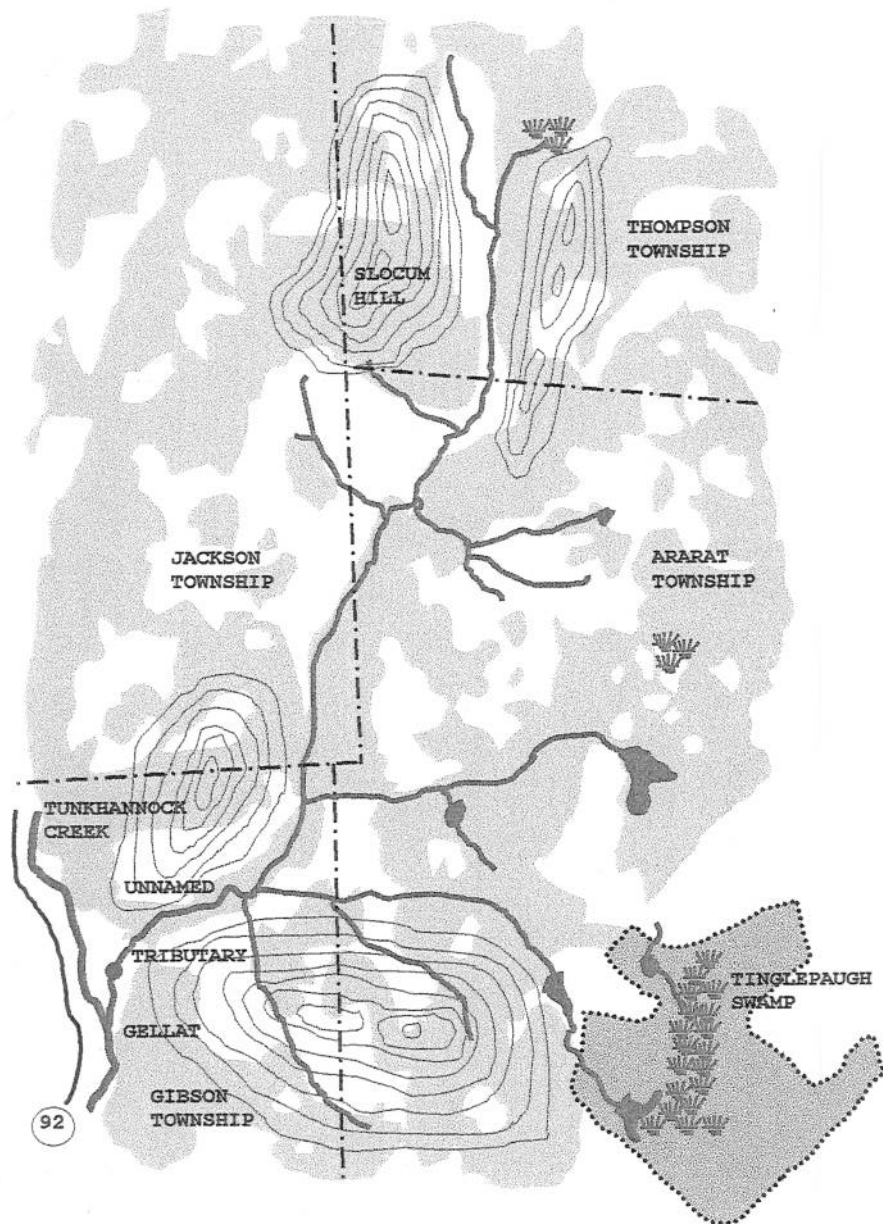
NA = Not Available.

Notes to Reviewer:

The following errors exist in D-Base:

<u>Stream</u>	<u>Section</u>	<u>D-Base Section Width</u>	<u>Correct Section Width</u>
Partners Creek	02	0.0 m	3.2 m
Willow Brook	01	1.0 m	1.9 m
Utley Brook	01	0.9 m	1.7 m

We've submitted correction sheets for these errors.



92



Scale:

1 inch = 1316 m

Legend:

-  Mountainous Area
-  Agricultural Area
-  Forested Area
-  State Game Lands 236
-  Township Boundary
-  Major Road
-  Wetlands
-  1999 Sample Site

Figure 2. Rock Creek drainage basin (404F).

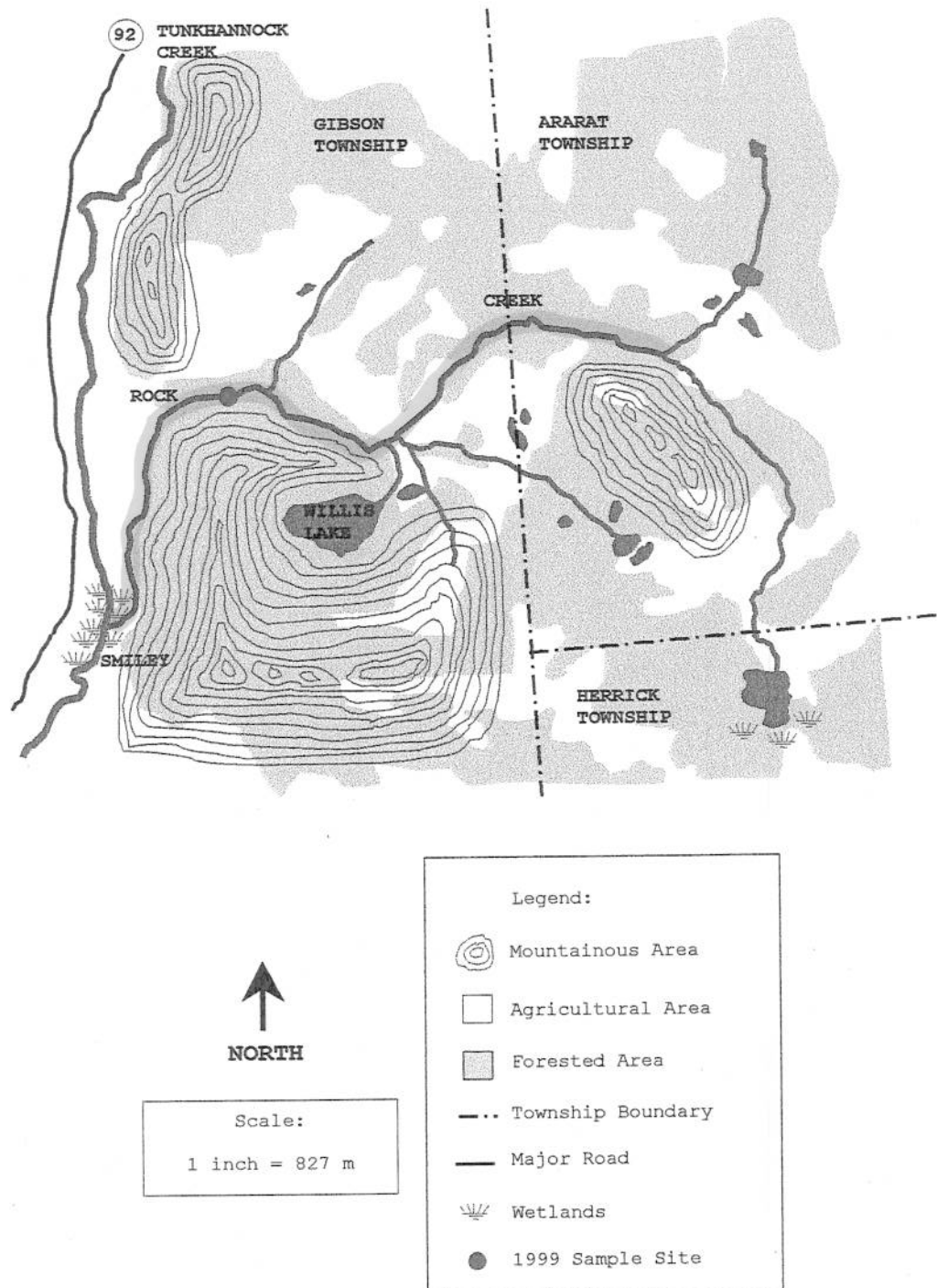
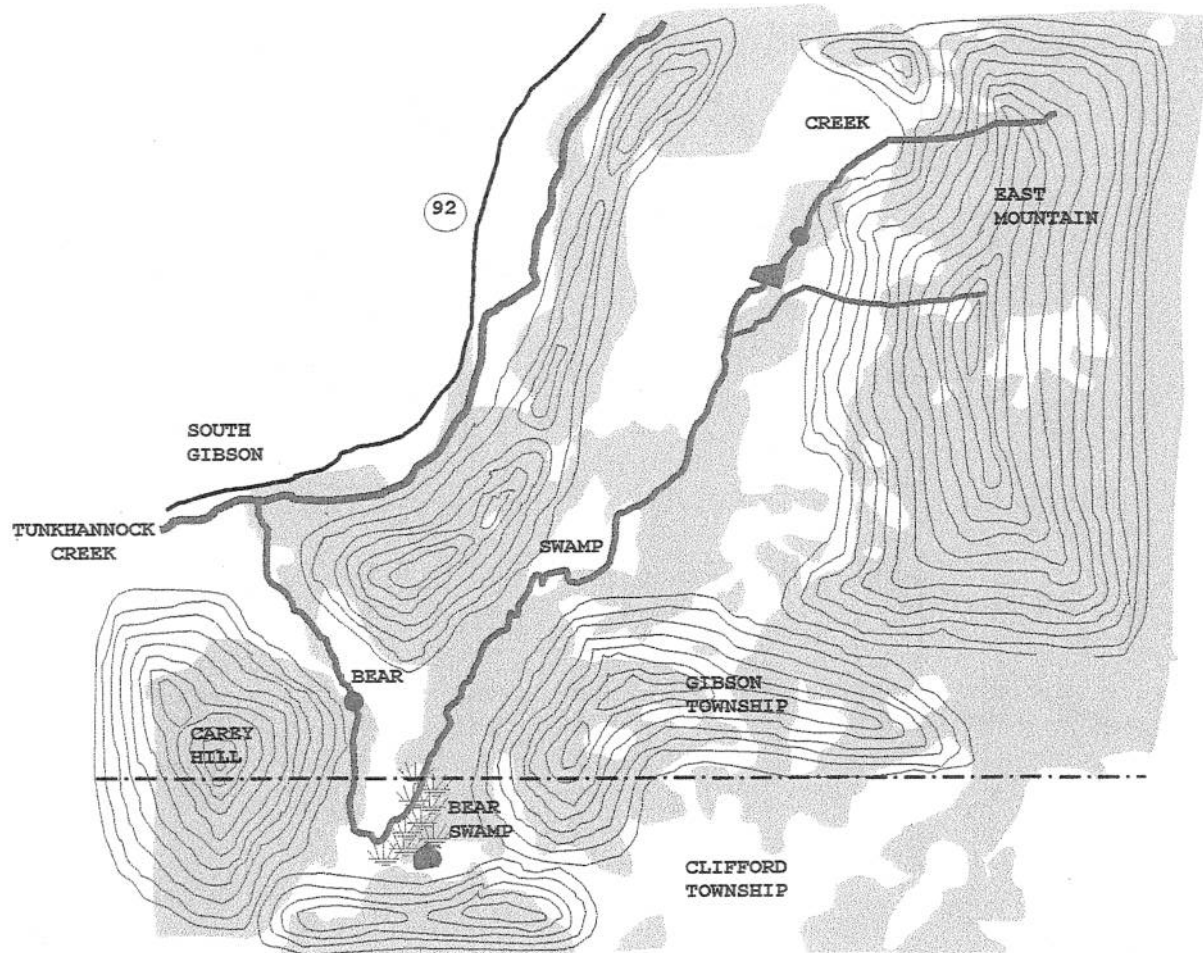


Figure 3. Bear Swamp Creek drainage basin (404F).

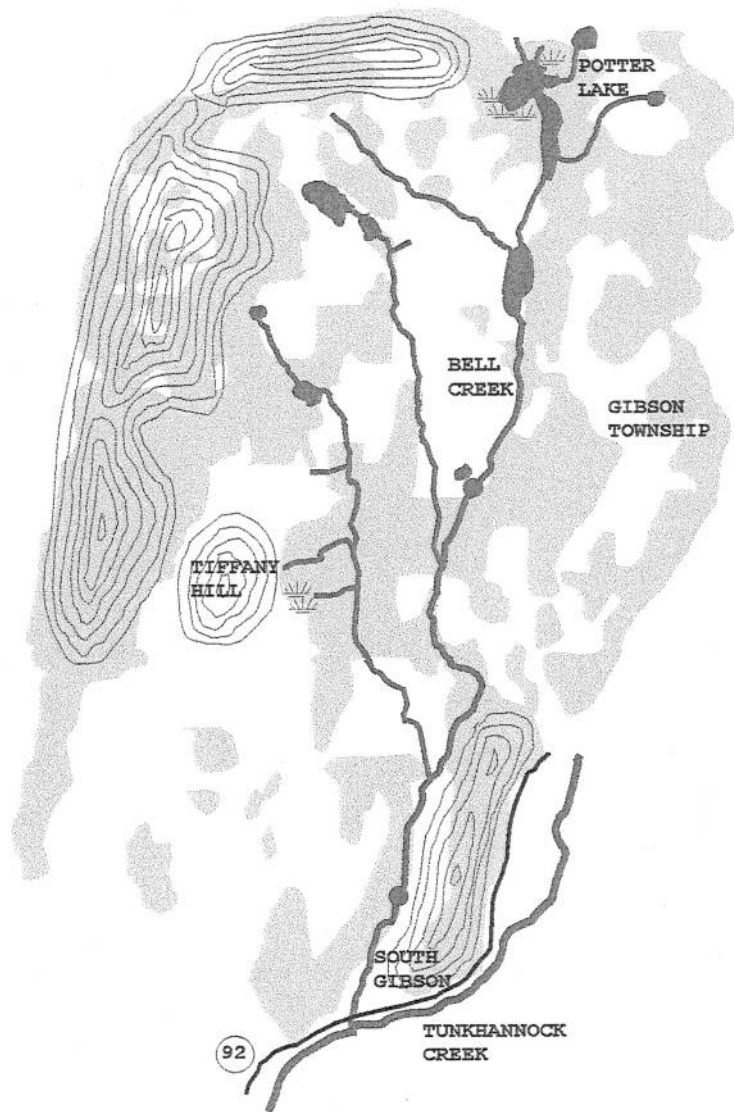


Scale:
1 inch = 1056 m

Legend:

-  Mountainous Area
-  Agricultural Area
-  Forested Area
-  Township Boundary
-  Major Road
-  Wetlands
-  1999 Sample Site

Figure 4. Bell Creek drainage basin (404F).



NORTH

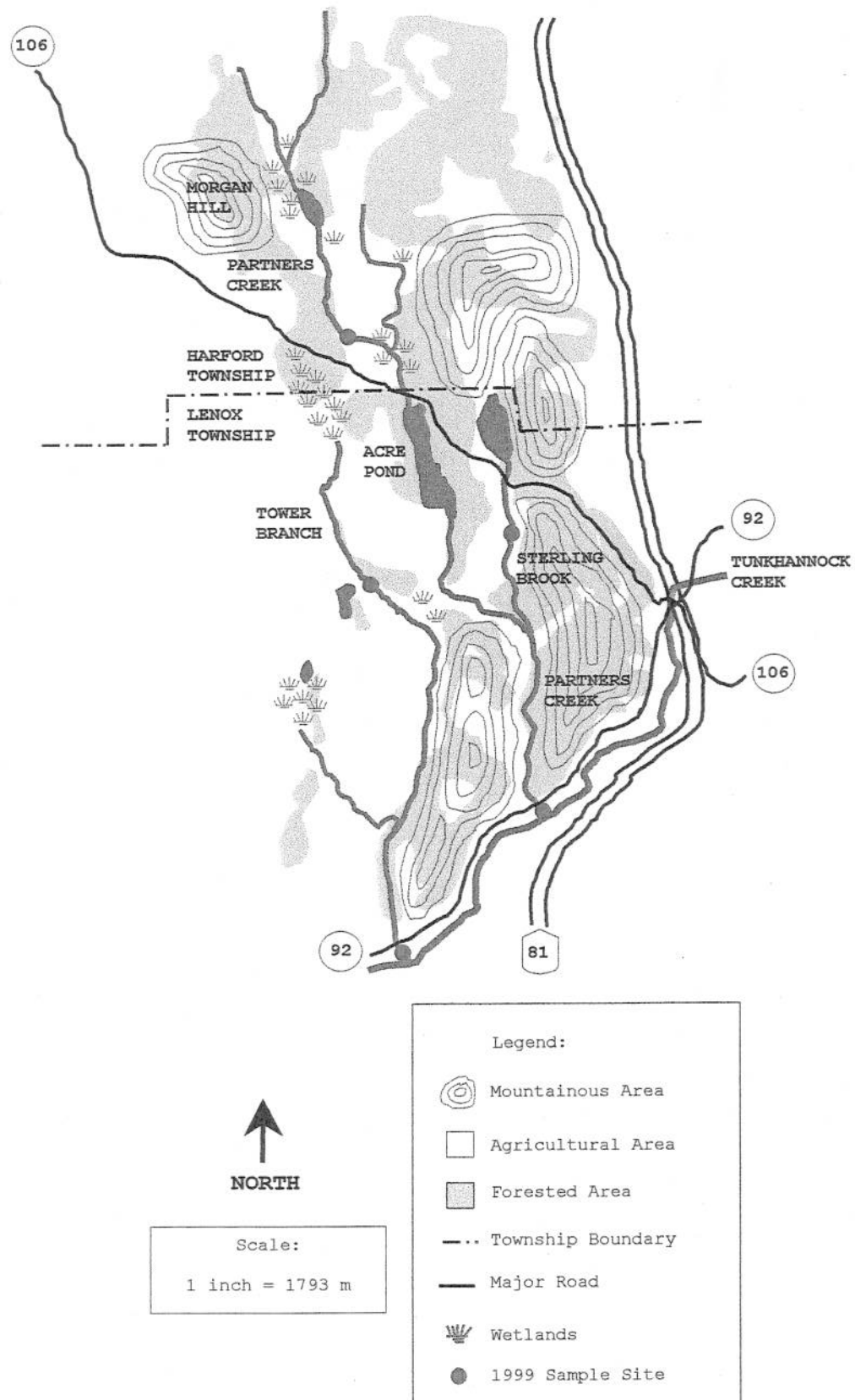
Scale:

1 inch = 1390 m

Legend:

-  Mountainous Area
-  Agricultural Area
-  Forested Area
-  Major Road
-  Wetlands
-  1999 Sample Site

Figure 5. Partners Creek and Tower Branch (404F) drainage basins.



DEP Stream Code: 29191
 Figure 6. Millard Creek and Willow Brook (404F) drainage basins.

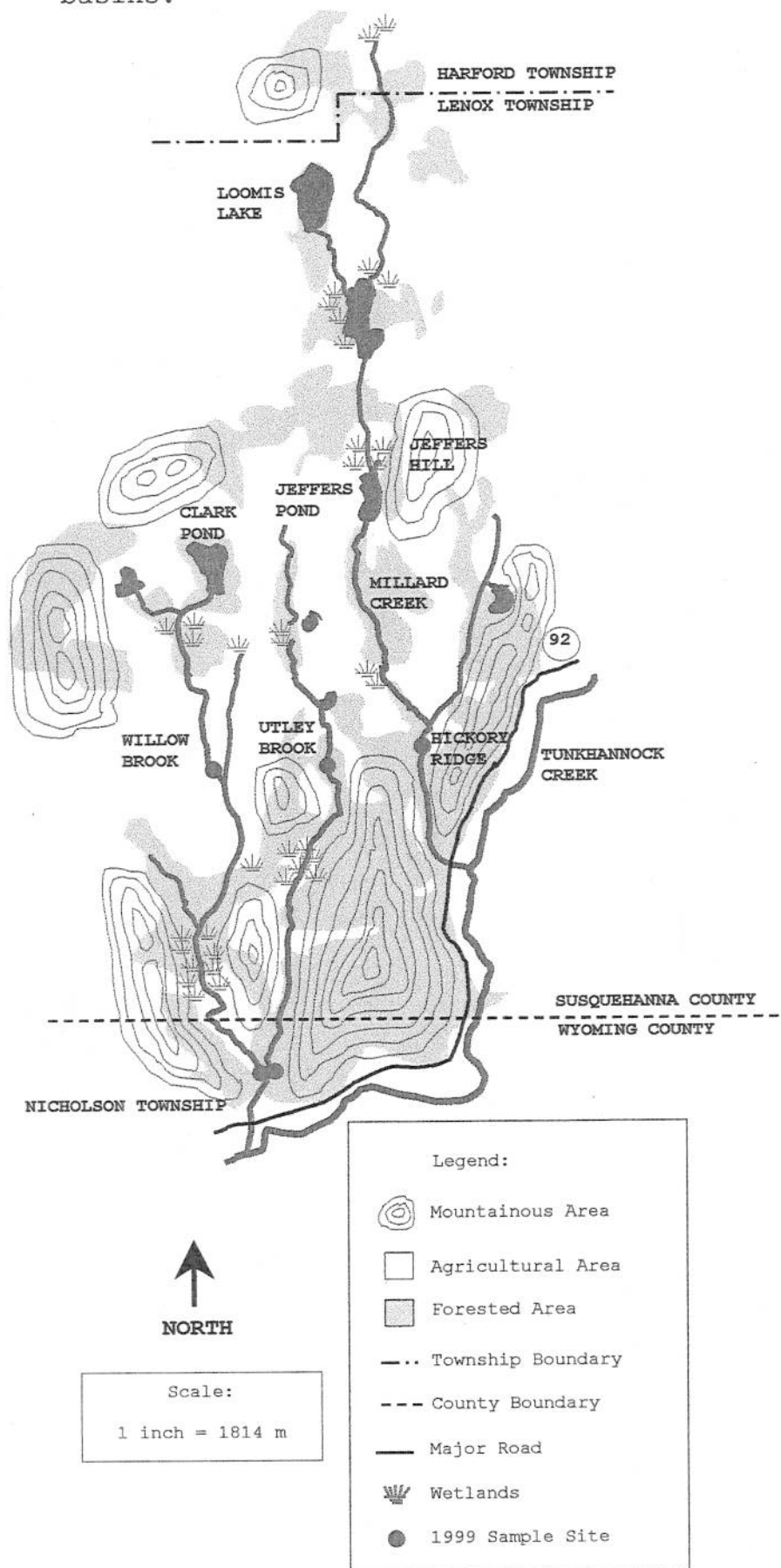


Figure 7. Horton Creek, Field Brook, and Monroe Creek (404F) drainage basins.

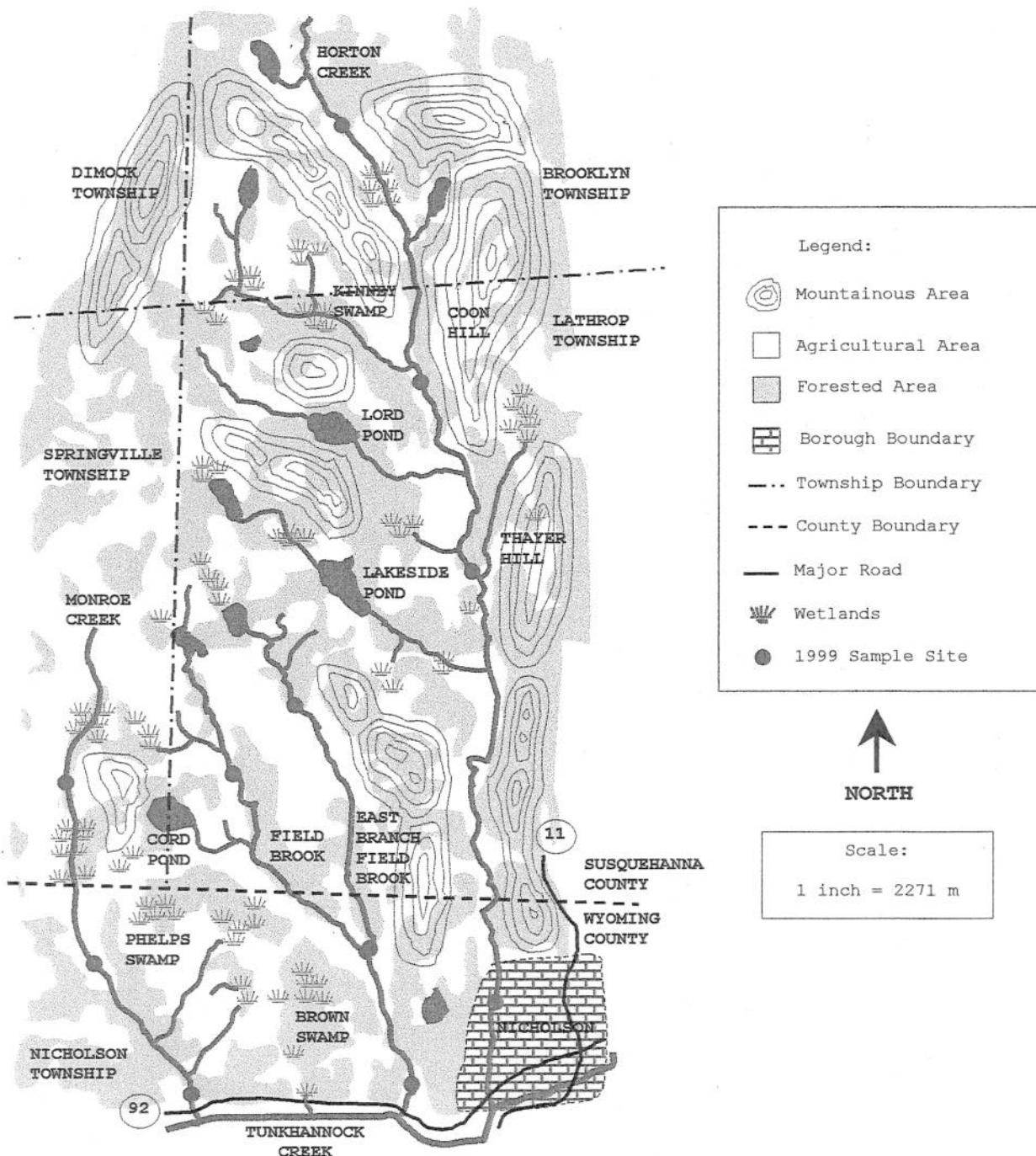


Figure 8. Swale Brook (404F) drainage basin.

