

PA FISH AND BOAT COMMISSION
DEP Stream Code: 45404 COMMENTS AND RECOMMENDATIONS
January 30, 2003

J. Aruaf
Higgins Run

WATER: Higgins Run (818E)

RECEIVED

Somerset County

EXAMINED: July 2001

FEB 10 2003

BY: Gary Smith and Rick Lorusso
PA Fish & Boat Commission
Division of Environmental Services

Bureau Director Action: *[Signature]* Date: *2-5-03*

Division Chief Action: *Richard A. Engler* Date: *1-31-03*

WW Unit Leader Action: _____ Date: _____

CW Unit Leader Action: *Russell T. Greene* Date: *1/30/03*

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CWU COMMENTS:

Higgins Run (818E), Sections 01 and 02, were examined during July 2001. Section 01 was sampled to update inventory information pending changes in mining activity in the drainage and Section 02 was examined as part of a five year Federal Aid project to assess trout populations in Class A wild trout waters.

Section 01

Section 01 can be characterized as a small, coldwater stream. A total of seven fish species were captured at two sample sites in 2001. Sampling at site RM 1.96 recorded the presence of a sparse population of wild brown trout, whereas sampling at site RM 1.61 recorded a dense wild brown trout population estimated at 91.05 kg/ha.

Overall, the estimated abundance of legal size (≥ 7 inches) wild brown trout was 55/km. Based on a section length of 1.7 miles (2.7 km) this translated into an estimated total of 149 legal size wild brown trout ranging from seven to twelve inches in length in Higgins Run, Section 01.

Section 02

Section 02 can be characterized as a small, coldwater stream. A total of nine fish species were captured during the 2001 examination, including a fine wild brown trout population estimated at 79.31 kg/ha.

During the 2001 survey the estimated abundance of legal size (≥ 7 inches) wild brown trout was 144/km. Based on a section length of 1.37 miles (2.2 km) this translated into an estimated total of 317 legal size brown trout ranging from seven to fourteen inches in length in Higgins Run, Section 02.

CWU RECOMMENDATIONS:

1. Due to the presence of a Class A wild brown trout population at site RM 1.61, I concur with the Area 8 recommendation stating that the upstream

limit of Section 02 should be extended upstream for a distance of 0.7 km to the Stone Bridge borehole.

2. Higgins Run (818E), Section 01, should be managed as a biomass Class D water under the Natural Yield option. Statewide regulations should apply with no stocking.
3. Higgins Run (818E), Section 02, should continue to be managed as a Class A wild brown trout water. Statewide regulations should apply with no stocking.

PENNSYLVANIA FISH AND BOAT COMMISSION
BUREAU OF FISHERIES
FISHERIES MANAGEMENT DIVISION

Higgins Run (818E) Management Report
Sections 01 and 02

Prepared by
Gary Smith and Rick Lorson

Fisheries Management Database Name: Higgins Rn
Lat/Lon: 400837785754

Date Sampled: July 2001

Date Prepared: December 2002

Introduction

Higgins Run is a 5.0 km coldwater stream located near Stoystown, PA in northcentral Somerset County and is a tributary to Quemahoning Reservoir. The Pennsylvania Department of Environmental Protection (DEP) Chapter 93 designation for Higgins Run, Section 01, (headwaters to the Solar #7 mine coal tipple) is Cold Water Fishes (CWF) (Pennsylvania Department of Environmental Protection 1999). Higgins Run, Section 02, (Solar #7 mine coal tipple to the mouth) is recognized as High Quality - Cold Water Fishes (HQ-CWF) because it contains a Class A wild brown trout population.

Genesis, Inc. Solar #7 mine is located along Higgins Run and was started in 1976. On average, 300 to 400 gallons per minute of mine water was pumped from the mine pool, treated, and released into Higgins Run near their coal tipple (River Mile [RM] 1.37) (P. Parsons Genesis, Inc. personal communication). The raw mine water is alkaline but has a high level of iron. Genesis, Inc. used lime to treat the mine water up until a few years ago and then switched to caustic soda and a conglomerate. The treated mine discharge had a pH around 8.0, total alkalinity of 130 mg/l, total iron of 2 mg/l, total sulfate of 444 mg/l, and low levels of manganese and aluminum based on July, August, and September 2001 and February 2002 monitoring reports provided by DEP. The Solar #7 mine discharge increased Higgins Run pH by 0.6 units, total alkalinity by 6 mg/l, total iron by 0.3 mg/l, total manganese by 0.1 mg/l, and total sulfate by 78 mg/l based on five sampling dates from 1997 to 2002. Mining at the Solar #7 mine ceased on January 31, 2002. Pumping and treating of the mine water continued until February 27, 2002. By the end of April 2002, hydraulic seals will be used to seal the mine entrances. The coal stockyard will be cleaned up and seeded.

Genesis, Inc. started a new mine, Genesis #17 mine, in the fall of 2001, which is projected to last about 15 to 20 years. The Genesis #17 mine is located in the Beaverdam Run watershed, but the Genesis #17 mine water is being treated and discharged into an old deep mine complex (Quemahoning mine pool). The mine water is currently being treated due to a high level of suspended solids with caustic soda and a conglomerate (P. Parsons Genesis, Inc. personal communication). Water in the Quemahoning mine pool comes out at the Stone Bridge borehole along Higgins Run just downstream of SR 0030 (RM 1.81). According to DEP, mine water from the Genesis #17 mine would account for a very small percentage (~1%) of the total amount of water in the Quemahoning mine pool (J. Winter, DEP - McMurray District Office personal communication). The DEP claims that the Genesis #17 mine would have no effect on the quality or quantity of the water coming out of the Stone Bridge borehole. Water quality at the Stone Bridge borehole is stable based on eight samples between 1996 and 2002 provided by DEP. The borehole has a pH around 6.4, total alkalinity of 105 mg/l, total iron less than 0.3 mg/l, total manganese less than 0.2 mg/l, total aluminum less than 0.5 mg/l, and total sulfate of 326 mg/l.

Section 01 of Higgins Run begins at an unnamed pond in the headwaters (RM 3.07) and extends 2.7 km to the Solar #7 mine coal tipple (RM 1.37). The last survey of Higgins Run, Section 01, by the Pennsylvania Fish and Boat Commission (PFBC) was conducted in 1993 (Lorson and Miko 1994).

Section 02 of Higgins Run begins at the Solar #7 mine coal tipple (RM 1.37) and extends 2.2 km to the mouth at Quemahoning Reservoir (RM 0.00) (Figure 1). The last survey of Higgins Run, Section 02, by the PFBC was conducted in 2000 (Smith and Lorson 2000). Total brown trout *Salmo trutta* biomass was estimated at a Class A level of 56.00 kg/ha for Section 02 in 2000. The July 2001 survey of Higgins Run, Section 02, was part of a five-year (1998-2002) statewide study to evaluate Class A wild trout waters. One site in Section 02 will be sampled on an annual basis through 2002. Additional sites were surveyed in Section 01 to update our management data and provide background data for a change in mining operations in the watershed.

Methods

Two sites in Section 01 and one site in Section 02 were surveyed in 2001 to characterize the sections (Figure 1). Site 0101 was located 111 meters downstream of SR 0030 bridge (upstream of the Stone Bridge borehole) at latitude 40°07'27", longitude 78°59'08" (RM 1.96) and was sampled for the first time in 2001. Site 0102 was located 976 meters upstream from T-707 bridge (downstream of the Stone Bridge borehole) at latitude 40°07'49", longitude 78°59'07" (RM 1.61) and was at the same location as in 1993. Site 0201 was located 200 meters downstream from SR 4021 bridge (downstream of the Solar#7 discharge) at latitude 40°08'31", longitude 78°57'59"

(RM 0.13) and was at the same location as in 1993, 1998, 1999, and 2000.

Physical, chemical, fish occurrence, relative fish abundance, trout abundance, and social data were collected for Higgins Run, Sections 01 and 02. Brown trout abundance and biomass at Site 0102 and Site 0201 were estimated using the Petersen Mark-recapture method. Fish sampling was accomplished with a Coffelt model BP-1C backpack electrofisher operated at 100-200 volts AC and 125-150 watts for 101 m at Site 0101, 200 m at Site 0102, and 210 m at Site 0201. Total electrofishing effort was 19 minutes at Site 0101, 39 minutes for the marking run and 47 minutes for the recapture run at Site 0102, and 49 minutes for the marking run and 48 minutes for the recapture run at Site 0201. The assessment was conducted on July 11 and 12, 2001 according to *Procedures for Stream and River Inventory Information Input* (Marcinko et al. 1986).

Results/Discussion

Section 01

Site 0101 (RM 1.96)

Site 0101 was located just downstream of the SR 0030 bridge and upstream of the Stone Bridge borehole. Trees were the dominant bank vegetation and provided dense shading. Stream banks at Site 0101 were moderately eroded. Silt and rubble were the dominant substrate types. Flow was low, and the mean stream width was 2.5 meters.

At Site 0101 pH was 7.7, total alkalinity was 41 mg/l, total hardness was 100 mg/l, and conductivity was 283 umhos in 2001 (Table 1). The Pennsylvania Department of Environmental Resources (DER) sampled just downstream of SR 0030 in June 1981 (Hughey 1982). Water quality testing was conducted just after a heavy rain and the stream was very turbid from coal dust that had washed off SR 0030. In June 1981 pH was 6.5, total alkalinity was 38 mg/l, and total hardness was 48 mg/l.

The DER fish survey in June 1981 yielded four species: blacknose dace *Rhinichthys atratulus*, creek chub *Semotilus atromaculatus*, white sucker *Catostomus commersoni*, and mottled sculpin *Cottus bairdi* (Hughey 1982). Seven fish species were collected at Site 0101 in 2001 (Table 2). In 2001, 10 wild brown trout in the 50 mm to 175 mm length groups, seven pumpkinseeds *Lepomis gibbosus*, three bluegills *Lepomis macrochirus*, and one yellow perch *Perca flavescens* were captured at the 101 m long site (Table 3). Of the 10 total wild brown trout, 2 were legal size (≥ 175 mm) trout. Total wild brown trout biomass using a one-pass catch estimate was 6.70 kg/ha in 2001. Biomass of wild brown trout less than 150 mm was estimated at 0.80 kg/ha at Site 0101 in 2001.

Site 0102 was located in the lower portion of Section 01, downstream of the Stone Bridge borehole. Trees were the dominant bank vegetation and provided dense shading. Stream banks were heavily eroded. Silt, gravel, and rubble were the major substrate types. Flow was normal, and the mean stream width was 3.2 meters. Water quality at Site 0102 remained relatively the same from 1993 to 2001 (Table 4). The pH level at Site 0102 was 6.9 in 2001 compared to 7.3 in 1993. Total alkalinity and total hardness were 80 mg/l and 388 mg/l in 2001, respectively and were very similar to 1993 levels. Specific conductance in 2001 was high at 781 umhos. All water quality parameter values, except for pH, increased from Site 0101 in 2001 to Site 0102 in 2001.

Wild brown trout and mottled sculpin were captured at Site 0102 in 2001 compared to only wild brown trout in 1993 (Table 5). Total wild brown trout biomass was estimated at a Class A level of 91.05 kg/ha in 2001 (Table 6). Overall, 185 total wild brown trout from length groups 25 mm to 300 mm were captured in 200 meters of electrofishing at Site 0102 in 2001. Of the 185 total wild brown trout, 17 were legal size (≥ 175 mm) trout, including one fish ≥ 300 mm (Table 7). In 1993 a total of five wild brown trout from length groups 200 mm to 275 mm were collected at Site 0102. Total wild brown trout biomass using a one-pass catch estimate was 9.81 kg/ha in 1993. In 2001, 5% of the estimated wild brown trout abundance (N/km) and 44% of the estimated wild brown trout biomass (kg/ha) were composed of legal size (≥ 175 mm) trout.

Section 02

Site 0201 (RM 0.13)

The water quality at Site 0201 in 2001 remained relatively the same from previous surveys (Table 8). The pH of 7.9 and total alkalinity of 97 mg/l were slightly higher than previous years and were the highest recorded. Total hardness, specific conductance, and total dissolved solids in 2001 were within the ranges observed in previous surveys. Flow was normal at the time of the survey. Site 0201 historical mean stream width of 4.9 m was used for the 2001 survey to calculate the site area for trout abundance and biomass estimates.

Nine fish species were collected in 2001, which was comparable to previous surveys (Table 9). Wild brown trout, blacknose dace, and white sucker were captured during all PFBC surveys at Site 0201. Hatchery rainbow trout *Oncorhynchus mykiss* were collected for the second year in a row after fingerling rainbow trout were stocked in Quemahoning Reservoir in the summer of 2000 by the PFBC. Johnny darter *Etheostoma nigrum* was present for the first time in 2001.

Total wild brown trout biomass at Site 0201 in 2001 increased from 2000 and was estimated at a Class A level of 79.31 kg/ha (Table 10)

and Figure 2). The estimated wild brown trout abundance (N/km) of 1,672/km in 2001 was the highest on record for Site 0201. The strong year class in 2000 resulted in 179% increase from 2000 to 2001 in biomass of brown trout from 100-174 mm. Overall, 238 total wild brown trout were captured in 210 meters of electrofishing at Site 0201 in 2001 (Table 11). Of the 238 total wild brown trout, 29 were legal size (≥ 175 mm) trout, including four fish ≥ 300 mm. In 2001, 9% of the estimated wild brown trout abundance (N/km) and 55% of the estimated wild brown trout biomass (kg/ha) were composed of legal size (≥ 175 mm) trout. Total hatchery rainbow trout biomass at Site 0201 was estimated at 4.84 kg/ha in 2001. Fingerling hatchery rainbow trout were stocked in Quemahoning Reservoir on a one-time basis in the summer of 2000 by the PFBC.

The sectioning strategy of Higgins Run will be changed due to the closing of the Solar #7 mine and the Class A wild brown trout population at Site 0102. Starting in 2002 Section 01 of Higgins Run will begin at an unnamed pond in the headwaters (River Mile [RM] 3.07) and extend 2.0 km to the Stone Bridge borehole (RM 1.81) (Figure 1). Section 02 of Higgins Run will begin at the Stone Bridge borehole (RM 1.81) and extend 2.9 km to the mouth at Quemahoning Reservoir (RM 0.00). The resectioning of Higgins Run will increase the length of Section 02, which has a Class A wild brown trout population, from 2.2 km to 2.9 km.

In 2002 most of the new Section 01 of Higgins Run was not accessible from public roads with 39% of the stream within 300 m of a road and 80% of the section in private ownership and closed to fishing (Table 12). Higgins Run, Section 02, was easily accessible with 100% of the section within 300 m of a road. In 2002, 51% of the new Section 02 was publicly owned by Cambria Somerset Authority (CSA) and 48% was privately owned and open to fishing.

The closing of the Solar #7 mine should not change the water quality in Higgins Run, Section 02, to the point of negatively affecting the wild brown trout population. The Solar #7 mine discharge increased Higgins Run pH by 0.6 units and total alkalinity by 6 mg/l based on five sampling dates from 1997 to 2002 provided by DEP. Based on our sampling, pH increased from 7.3 at Site 0102 (upstream of the Solar mine discharge) to 7.7 at Site 0201 (downstream of the Solar mine discharge) in 1993. Total alkalinity was higher at Site 0102 (89 mg/l) than at Site 0201 (83 mg/l) in 1993. During our 2001 sampling, pH and total alkalinity were higher at Site 0201 (7.9 and 97 mg/l) than at Site 0102 (6.9 and 80 mg/l). The water quality upstream of the Solar #7 mine was good enough to support a Class A wild brown trout population at Site 0102 in 2001. The wild brown trout population at Site 0201 was not the result of the treated mine discharge from Solar #7 mine; therefore, the Class A wild brown trout population at Site 0201 should be maintained at a high density after termination of treated mine discharge into the stream.

Several potential problems with the closing of the Solar #7 mine are water quantity during drought years and the possibility of the mine water not being contained in the mine pool. The raw mine water is alkaline but has a high level of iron that may impair aquatic life in Higgins Run if the mine water entered Higgins Run.

The new Genesis #17 discharges treated mine water into the Quemahoning mine pool that comes out at the Stone Bridge borehole along Higgins Run just downstream of SR 0030. According to DEP, mine water from the Genesis #17 mine would account for a very small percentage (~1%) of the total amount of water in the Quemahoning mine pool and would have no effect on the quality or quantity of the water coming out of the Stone Bridge borehole. The borehole water quality should be monitored by DEP to ensure that water quality is not degraded and does not negatively affect one of the few Class A wild brown trout waters in southwestern PA.

- 1) Total wild brown trout biomass at Site 0201 increased from 2000 and was estimated at a Class A level of 79.31 kg/ha in 2001. Continue to manage Higgins Run, Section 02, as a Class A Wild Brown Trout water. Toward this end, rainbow trout will not be stocked in Quemahoning Reservoir.
- 2) Total wild brown trout biomass at Site 0102 was estimated at a Class A level of 91.05 kg/ha in 2001. Total wild brown trout biomass using a one-pass catch estimate was 9.81 kg/ha in 1993.
- 3) The sectioning strategy of Higgins Run will be changed due to the closing of the Solar #7 mine and the Class A wild brown trout population movement upstream to Site 0102. Starting in 2002 the Section 01 downstream limit/Section 02 upstream limit will be the Stone Bridge borehole. The resectioning of Higgins Run will increase the length of Section 02, which has Class A wild brown trout population, from 2.2 km to 2.9 km. This change should be made to DEP Chapter 93. A copy of this report should be provided to John Arway, PFBC, Environmental Services Division.
- 4) Ten wild brown trout, including seven young-of-the-year, were collected at Site 0101 in Higgins Run, Section 01, (headwaters to Stone Bridge borehole). Total wild brown trout biomass using a one-pass catch estimate was 6.70 kg/ha in 2001. Biomass of wild brown trout less than 150 mm was estimated at 0.80 kg/ha at Site 0101 in 2001. Higgins Run, Section 01, should be added to the PFBC's listing of surveyed streams having verified trout reproduction.
- 5) Resurvey Higgins Run, Section 02, in 2002 as part of a five-year (1998-2002) statewide study to evaluate Class A wild trout waters.
- 6) The closing of the Genesis, Inc. Solar #7 mine and opening of Genesis, Inc. Genesis #17 mine should be monitored to ensure that water quality is not degraded and does not negatively affect one of the few Class A wild brown trout waters in southwestern PA. A copy of this report should be sent to a) Tom Proch, Aquatic Biologist, Pennsylvania Department of Environmental Protection, 400 Water Front Drive, Pittsburgh, PA 15222, b) Department of Environmental Protection, District Mining Operations - Cambria Office, 286 Industrial Park Road, Ebensburg, PA 15931, c) Len Lichvar, Stonycreek Conemaugh River Improvement Project (SCRIP), P.O. Box 153, Johnstown, PA 15907 and d) James Grecco, Cambria Somerset Authority, 1001 Broad Street, Johnstown, PA 15906.

Literature Cited

- Hughey, R. 1982. Aquatic biological investigation of Higgins Run, Somerset County, PA. DER Bureau of Water Quality Management, Lewistown Field Office. Lewistown, PA.
- Lorson, R., and D. Miko. 1994. Higgins Run (818E) management report, Sections 01 and 02. Pennsylvania Fish and Boat Commission files. Division of Fisheries Management. Fisheries Management Area 8. Somerset, Pennsylvania.
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- Pennsylvania Department of Environmental Protection. 1999. Department of Environmental Protection Chapter 93. Water quality standards. Bureau of Watershed Conservation. Division of Water Quality Assessment and Standards. Harrisburg, Pennsylvania.
- Smith, G., and R. Lorson. 2000. Higgins Run (818E) management report, Section 02. Pennsylvania Fish and Boat Commission files. Division of Fisheries Management. Fisheries Management Area 8. Somerset, Pennsylvania.

Table 1. Chemical characteristics of Site 0101 in Section 01 of Higgins Run (818E), Somerset County; July 2001. Site 0101 was located 111 meters downstream of SR 0030 bridge at latitude 40°07'27", longitude 78°59'08" (River Mile 1.96).

	7/11/01
Water temperature (°C)	19.0
pH (standard units)	7.7
Total Alkalinity (mg/l)	41
Total Hardness (mg/l)	100
Specific Conductance (umhos)	283
Total Dissolved Solids (mg/l)	190

Table 2. Species occurrence at Site 0101 in Section 01 of Higgins Run (818E), Somerset County; July 2001. Site 0101 was located 111 meters downstream of SR 0030 bridge at latitude 40°07'27", longitude 78°59'08" (River Mile 1.96).

Common name	Scientific name
Brown trout	<i>Salmo trutta</i>
Blacknose dace	<i>Rhinichthys atratulus</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Bluegill	<i>Lepomis macrochirus</i>
Yellow perch	<i>Perca flavescens</i>
Goldfish	<i>Carassius auratus</i>
Mottled sculpin	<i>Cottus bairdi</i>
Species Total: 7	

Table 3. Length frequency distribution for wild brown trout at Site 0101 in Section 01 of Higgins Run (818E), Somerset County; July 2001. Site 0101 was located 111 meters downstream of SR 0030 bridge at latitude 40°07'27", longitude 78°59'08" (River Mile 1.96).

Length group (mm)	Brown trout
50	6
75	1
100	--
125	--
150	1
175	2
Total	10

Table 4. Chemical characteristics of Site 0102 in Section 01 of Higgins Run (818E), Somerset County; September 1993 and July 2001. Site 0102 was located 976 meters upstream from T-707 bridge at latitude 40°07'49", longitude 78°59'07" (River Mile 1.61).

	9/16/93	7/11/01
Water temperature (°C)	16.0	13.0
pH (standard units)	7.3	6.9
Total Alkalinity (mg/l)	89	80
Total Hardness (mg/l)	392	388
Specific Conductance (umhos)	906	781
Total Dissolved Solids (mg/l)	613	525

Table 5. Species occurrence at Site 0102 in Section 01 of Higgins Run (818E), Somerset County; September 1993 and July 2001. Site 0102 was located 976 meters upstream from T-707 bridge at latitude 40°07'49", longitude 78°59'07" (River Mile 1.61).

Common name	Scientific name	9/16/93	7/11/01
Brown trout	<i>Salmo trutta</i>	X	X
Mottled sculpin	<i>Cottus bairdi</i>		X
Species Total:		1	2

Table 6. Estimated abundance and biomass using the Petersen Mark-Recapture estimate for wild brown trout at Site 0102 in Section 01 of Higgins Run (818E), Somerset County; July 2001. Site 0102 was located 976 meters upstream from T-707 bridge at latitude 40°07'49", longitude 78°59'07" (River Mile 1.61).

Length group (mm)	Population estimate	N/ha	kg/ha	N/km
25	1	17	0.02	5
50	260	4,333	13.00	1,300
75	5	83	0.33	25
100	1	17	0.32	5
125	14	238	7.39	72
150	41	675	29.70	203
175	7	117	8.52	35
200	4	67	6.53	20
225	2	33	4.53	10
250	2	33	6.60	10
275	2	33	8.43	10
300	1	17	5.68	5
Totals	340	5,663	91.05	1,699

Table 7. Summary information for wild brown trout collected at Site 0102 in Section 01 of Higgins Run (818E), Somerset County; July 2001.

Stream	Higgins Run
Site Number	Site 0102
Site Description	1,067 yards upstream from T-707 bridge at latitude 40°07'49", longitude 78°59'07"
Site River Mile (RM)	RM 1.61
Site Length	219 yards
Site Width	3.5 yards
Site Area	0.16 acre
Month/Year Sampled	July 2001
Total number of wild brown trout captured at the site	185
Total number of legal size (≥ 7 inches) wild brown trout captured at the site	17
Total number of wild brown trout ≥ 12 inches captured at the site	1
Total number of wild brown trout ≥ 14 inches captured at the site	0
Estimated number of wild brown trout from 100 yards of stream	84
Estimated number of legal size (≥ 7 inches) wild brown trout from 100 yards of stream	8
Estimated number of wild brown trout ≥ 12 inches from 100 yards of stream	0
Estimated number of wild brown trout ≥ 14 inches from 100 yards of stream	0

Table 8. Water quality characteristics for Site 0201 in Section 02 of Higgins Run (818E), Somerset County; September 1993, June 1998, June 1999, July 2000, and July 2001. Site 0201 was located 200 meters downstream from SR 4021 bridge at latitude 40°08'31", longitude 78°57'59" (River Mile 0.13).

Characteristic	9/16/93	6/29/98	6/22/99	7/06/00	7/11/01
Water Temperature (°C)	16.0	14.5	12.0	13.5	14.0
pH (standard units)	7.7	7.7	7.8	7.7	7.9
Total Alkalinity (mg/l)	83	67	74	80	97
Total Hardness (mg/l)	444	324	396	356	408
Specific Conductance (umhos)	1,057	690	925	805	880
Total Dissolved Solids (mg/l)	790	464	622	536	591

Table 9. Fish species occurrence at Site 0201 in Section 02 of Higgins Run (818E), Somerset County; September 1993, June 1998, June 1999, July 2000, and July 2001. Site 0201 was located 200 meters downstream from SR 4021 bridge at latitude 40°08'31", longitude 78°57'59" (River Mile 0.13).

Common name	Scientific name	9/93	6/98	6/99	7/00	7/01
Brown trout	<i>Salmo trutta</i>	X	X	X	X	X
Rainbow trout - hatchery	<i>Oncorhynchus mykiss</i>				X	X
Bluntnose minnow	<i>Pimephales notatus</i>	X		X		
Blacknose dace	<i>Rhinichthys atratulus</i>	X	X	X	X	X
Creek chub	<i>Semotilus atromaculatus</i>	X	X	X		
White sucker	<i>Catostomus commersoni</i>	X	X	X	X	X
Northern hog sucker	<i>Hypentelium nigricans</i>	X				
Yellow bullhead	<i>Ameiurus natalis</i>		X	X	X	X
Brown bullhead	<i>Ameiurus nebulosus</i>	X				
Pumpkinseed	<i>Lepomis gibbosus</i>	X				X
Bluegill	<i>Lepomis macrochirus</i>				X	X
Yellow perch	<i>Perca flavescens</i>	X				
Greenside darter	<i>Etheostoma blennioides</i>				X	
Johnny darter	<i>Etheostoma nigrum</i>					X
Mottled sculpin	<i>Cottus bairdi</i>		X	X	X	X
Species Total		9	6	7	8	9

Table 10. Estimated abundance and biomass using the Zippin three-pass removal estimate in 1993 and the Petersen Mark-Recapture estimate in 1998, 1999, 2000, and 2001 for wild brown trout at Site 0201 in Section 02 of Higgins Run (818E), Somerset County; September 1993, June 1998, June 1999, July 2000, and July 2001. Site 0201 was located 200 meters downstream from SR 4021 bridge at latitude 40°08'31", longitude 78°57'59" (River Mile 0.13).

Length group (mm)	Sept 16, 1993		June 29, 1998		June 22, 1999		July 06, 2000		July 11, 2001	
	N/km	kg/ha	N/km	kg/ha	N/km	kg/ha	N/km	kg/ha	N/km	kg/ha
25	--	--	5	0.01	14	0.03	10	0.02	19	0.04
50	--	--	607	3.82	343	1.44	959	6.04	1,032	6.50
75	161	2.51	38	0.40	--	--	181	2.66	77	1.30
100	26	0.76	33	1.19	10	0.36	57	2.04	61	1.93
125	--	--	134	7.87	122	6.94	14	0.99	166	9.05
150	27	2.98	198	20.35	91	8.06	71	7.05	174	17.17
175	19	3.10	114	16.56	24	3.20	36	4.80	67	9.24
200	14	3.08	14	3.51	82	17.49	24	5.30	14	3.06
225	20	7.29	24	6.25	54	14.63	38	11.76	19	5.00
250	40	18.13	30	13.06	19	6.44	5	1.97	24	10.60
275	16	10.03	29	17.34	5	2.38	10	5.88	--	--
300	--	--	5	3.03	10	6.66	5	3.60	10	6.66
325	5	4.91	10	8.76	10	6.90	5	3.89	5	3.88
350	--	--	--	--	5	4.70	--	--	5	4.88
Total	329	52.79	1,240	102.15	788	79.23	1,413	56.00	1,672	79.31

Table 11. Summary information for wild brown trout collected at Site 0201 in Section 02 of Higgins Run (818E), Somerset County; June 1998, June 1999, July 2000, and July 2001.

Stream	Higgins Run	Higgins Run	Higgins Run	Higgins Run
Site Number	Site 0201	Site 0201	Site 0201	Site 0201
Site Description	219 yards downstream from SR 4021 bridge	219 yards downstream from SR 4021 bridge	219 yards downstream from SR 4021 bridge	219 yards downstream from SR 4021 bridge
Site River Mile (RM)	RM 0.13	RM 0.13	RM 0.13	RM 0.13
Site Length	230 yards	230 yards	230 yards	230 yards
Site Width	5.4 yards	5.4 yards	5.4 yards	5.4 yards
Site Area	0.26 acre	0.26 acre	0.26 acre	0.26 acre
Month/Year Sampled	June 1998	June 1999	July 2000	July 2001
Total number of wild brown trout captured at the site	183	117	178	238
Total number of legal size (≥ 7 inches) wild brown trout captured at the site	43	38	22	29
Total number of wild brown trout ≥ 12 inches captured at the site	3	5	2	4
Total number of wild brown trout ≥ 14 inches captured at the site	0	1	0	1
Estimated number of wild brown trout from 100 yards of stream	80	51	77	103
Estimated number of legal size (≥ 7 inches) wild brown trout from 100 yards of stream	19	17	10	13
Estimated number of wild brown trout ≥ 12 inches from 100 yards of stream	1	2	1	2
Estimated number of wild brown trout ≥ 14 inches from 100 yards of stream	0	0	0	0

Higgins Run

Table 12. Social and physical characteristics of Sections 01 and 02 of Higgins Run (818E), Somerset County.

Characteristics	Section 01	Section 02
USGS Quadrangles	Stoystown (R14) Hooversville (Q14)	Hooversville (Q14)
Social:		
Ownership		
Date Assessed	12/02	12/02
% Public	0	51
% Private (open)	20	48
% Private (closed)	80	1
Road Accessibility		
Date Assessed	12/02	12/02
% within 100 m	16	85
% within 300 m	39	100
% within 500 m	54	100
Human Population		
Census Year	2000	2000
Density (#/sq km)	24	24
Physical:		
Length (km)	2.0	2.9
Gradient (m/km)	21.2	16.7

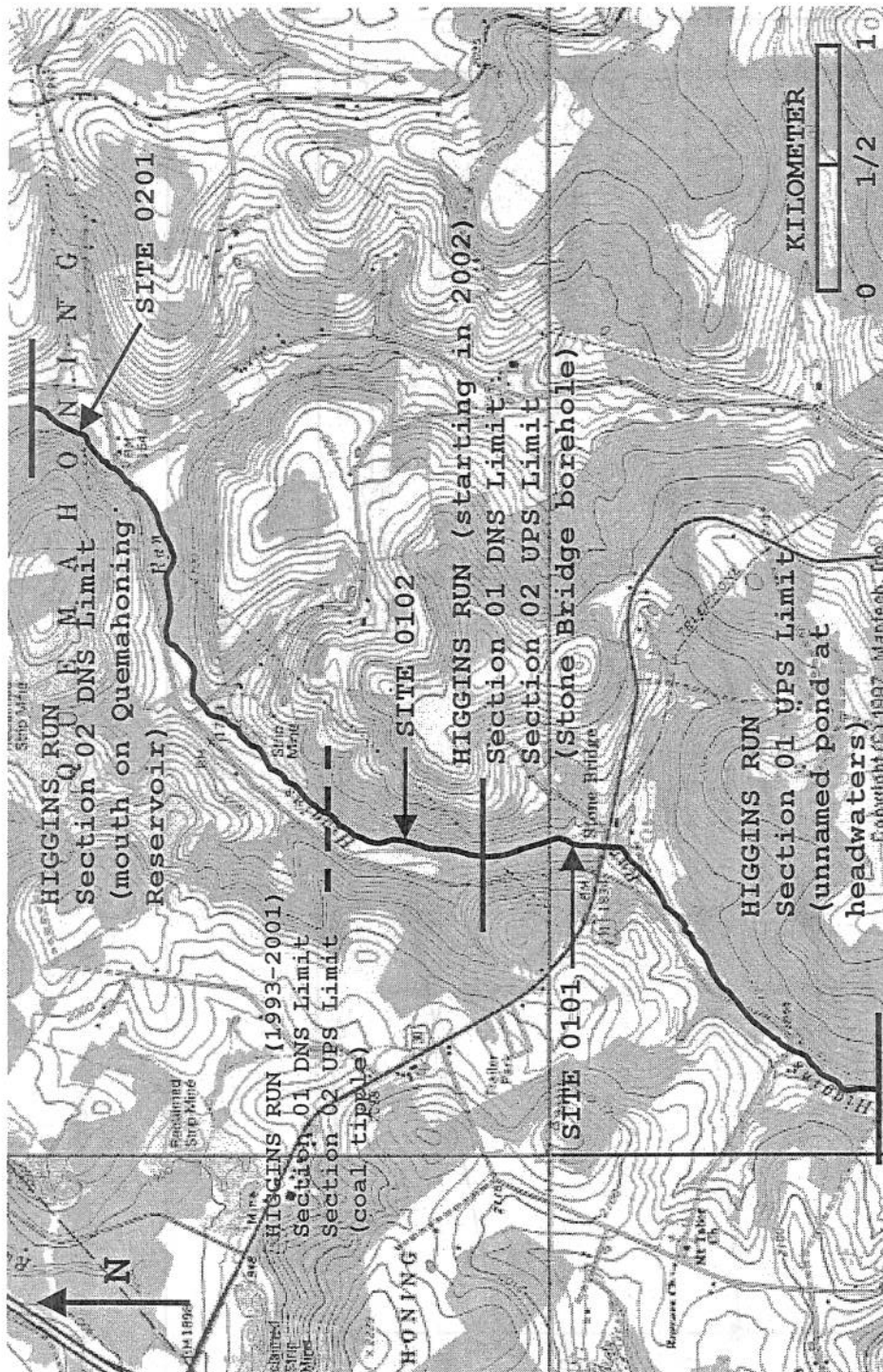


Figure 1. Site locations and section limits for Sections 01 and 02 of Higgins Run (818E), Somerset County; June 2001. Site 0101 was located 111 meters downstream of SR 0030 bridge at latitude 40°07'27", longitude 78°59'08" (RM 1.96). Site 0102 was located 976 meters upstream from T-707 bridge at latitude 40°07'49", longitude 78°59'07" (RM 1.61). Site 0201 was located 200 meters downstream from SR 4021 bridge at latitude 40°08'31", longitude 78°57'59" (RM 0.13).

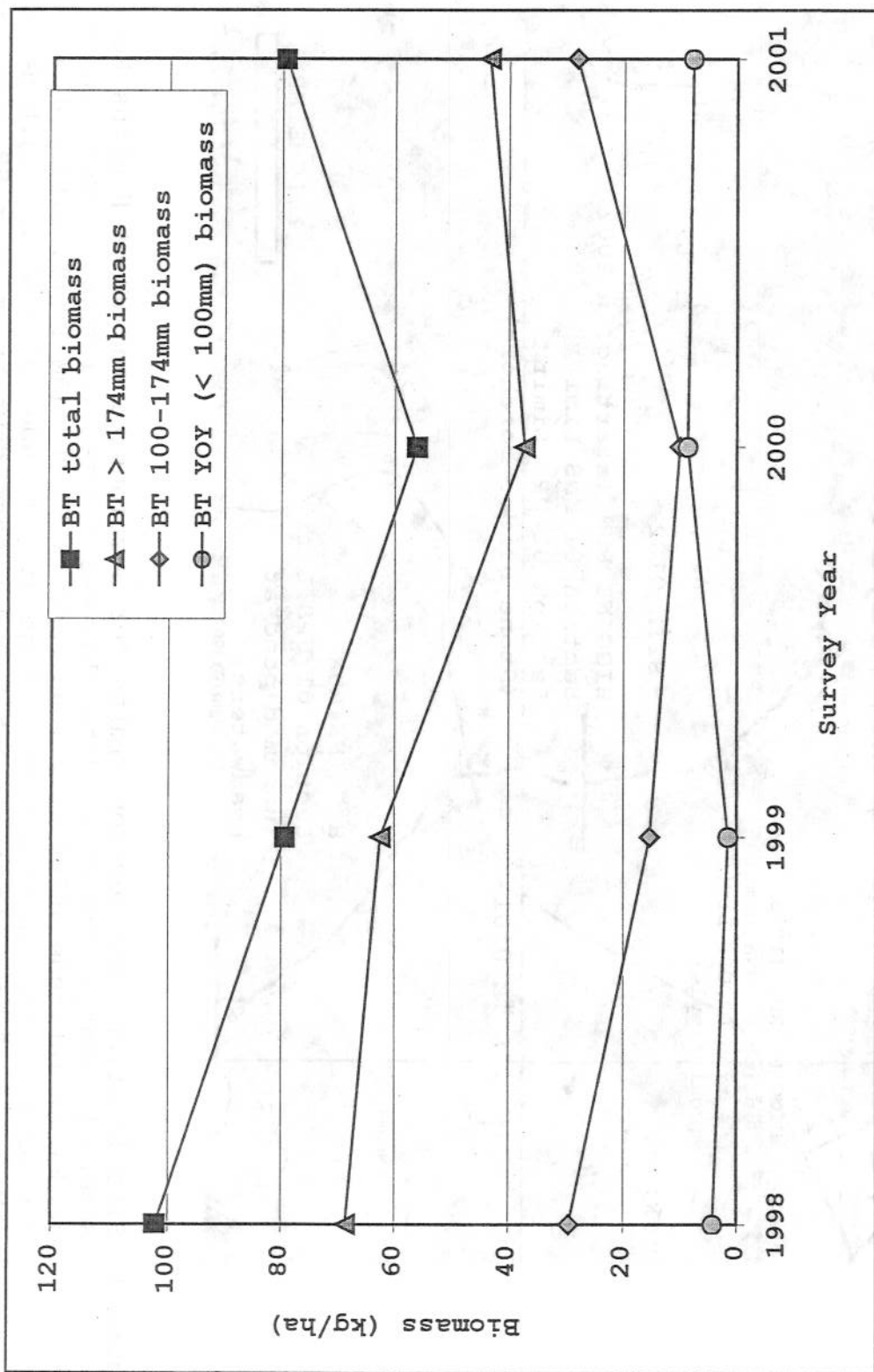


Figure 2. Estimated biomass of wild brown trout at Site 0201 in Section 02 of Higgins Run (818E), Somerset County; June 1998, June 1999, July 2000, and July 2001. Site 0201 was located 200 meters downstream from SR 4021 bridge at latitude 40°08'31", longitude 78°57'59" (River Mile 0.13).

DEP Stream Code: 45404 PA FISH AND BOAT COMMISSION
COMMENTS AND RECOMMENDATIONS
December 7, 2000

Dep via 23
RECEIVED
Higgins Run
DEC 13 2000

WATER: Higgins Run (818E)

PA Fish & Boat Commission
Division of Environmental Services

EXAMINED: July 2000

BY: Gary Smith and Rick Lorson

Bureau Director Action: APPROVED. Deland R. Griffith Date: 12-8-00

Division Chief Action: Richard A. Snyder - concur Date: 12-7-00

WW Unit Leader Action: _____ Date: _____

CW Unit Leader Action: R. Thomas Guinn Date: 12/7/00

=====

CWU COMMENTS:

Higgins Run (818E), Section 02, was examined during July 2000 as part of a five year Federal Aid project to assess Class A wild trout fisheries.

Section 02 can be characterized as a small, coldwater stream. A total of eight fish species were captured during the 2000 inventory, including an excellent Class A wild brown trout fishery estimated at 56 kg/ha. Although total wild brown trout biomass has declined since 1998. It should be noted that the estimated wild brown trout abundance (N/ha) in 2000 was the highest on record for the time series data collection set. This can primarily be attributed to a numerically strong year class in 2000.

CWU RECOMMENDATIONS:

1. Higgins Run (818E), Section 02, should continue to be managed as a Class A wild brown trout fishery. Conventional statewide regulations should apply with no stocking.
2. Section 02 should continue to be monitored on an annual basis as part of the Federal Aid project to assess Class A wild trout fisheries.
3. Due to the presence of a viable Class A wild brown trout fishery, the DEP Water Quality Standards should be upgraded to HQ-CWF. The special protected use classification should be applied to the Higgins Run basin from the Coal Tipple at RM 1.37 downstream to the mouth. A copy of this report should be forwarded to DEP via Environmental Services.

PENNSYLVANIA FISH AND BOAT COMMISSION
BUREAU OF FISHERIES
FISHERIES MANAGEMENT DIVISION
Fisheries Management Area 8

Higgins Run (818E) Management Report
Section 02
(Abstract)

Prepared by
Gary Smith and Rick Lorson

Date Sampled: July 2000

Date Prepared: October 2000

Higgins Run is a 5.0 km coldwater stream located near Stoystown, PA in northcentral Somerset County and is a tributary to Quemahoning Reservoir. Section 02 of Higgins Run begins at the coal tipple (River Mile [RM] 1.37) and extends 2.2 km to the mouth at Quemahoning Reservoir (RM 0.00) (Figure 1). The Department of Environmental Protection Chapter 93 designation for Higgins Run is Cold Water Fishes (CWF) (Pennsylvania Department of Environmental Protection 1999). The last survey of Higgins Run by the Pennsylvania Fish and Boat Commission (PFBC) was conducted in 1999 (Smith and Lorson 1999). Total brown trout (*Salmo trutta*) biomass was estimated at a Class A level of 79.23 kg/ha for Section 02 in 1999.

The July 2000 survey of Higgins Run is part of a five-year (1998-2002) statewide study to evaluate Class A wild trout waters. One site in Section 02 will be sampled on an annual basis. Site 0201, at the same location as in 1993, 1998, and 1999, was located 200 m downstream from SR 4021 bridge at RM 0.13. Brown trout abundance and biomass were estimated using the Petersen Mark-Recapture method. Fish sampling was accomplished with a Coffelt model BP-1C backpack electrofisher operated at 125 volts AC and 150 watts for 210 meters. The assessment at Site 0201 was conducted on July 06 and 07, 2000 according to *Procedures for Stream and River Inventory Information Input* (Marcinko et al. 1986).

The water quality at Site 0201 in 2000 had remained consistent from previous surveys (Table 1). The pH was 7.7, total alkalinity was 80 mg/l, and total hardness was 356 mg/l. Flow was normal.

Eight fish species were collected in 2000, which was comparable to previous surveys (Table 2). Hatchery rainbow trout (*Oncorhynchus mykiss*), bluegill (*Lepomis macrochirus*), and greenside darter (*Etheostoma blennioides*) were collected for the first time in 2000. Total wild brown trout biomass at Site 0201 decreased from 1998 and

1999 levels and was estimated at a Class A level of 56.00 kg/ha in 2000 (Table 3). The drought years of 1998 and 1999 could have contributed to the decline in brown trout biomass for 2000. Total hatchery rainbow trout biomass at Site 0201 was estimated at 7.79 kg/ha in 2000. Fingerling hatchery rainbow trout were stocked in Quemahoning Reservoir in the summer of 2000 by the PFBC. Hatchery rainbow trout will not be stocked in Quemahoning Reservoir in the future. Brown trout fingerlings will continue to be stocked into Quemahoning Reservoir.

Management Recommendations

- 1) Total wild brown trout biomass at Site 0201 decreased from 1998 and 1999 levels and was estimated at a Class A level of 56.00 kg/ha in 2000. Continue to manage Higgins Run, Section 02, as a Class A Wild Brown Trout water.
- 2) Resurvey Higgins Run, Section 02, in the years 2001 and 2002 as part of a five year (1998-2002) statewide study to evaluate Class A wild trout waters.
- 3) A copy of this report should be sent to Tom Proch, Aquatic Biologist, Pennsylvania Department of Environmental Protection, 400 Water Front Drive, Pittsburgh, PA 15222.

Literature Cited

- Marcinko, M.T., R.D. Lorson, and R. Hoopes. 1986. Procedures for stream and river inventory information input. Pennsylvania Fish and Boat Commission files. Division of Fisheries Management. Fisheries Management Area 8. Somerset, Pennsylvania.
- Pennsylvania Department of Environmental Protection. 1999. Department of Environmental Protection Chapter 93. Water quality standards. Bureau of Watershed Conservation. Division of Water Quality Assessment and Standards. Harrisburg, Pennsylvania.
- Smith, G., and R. Lorson. 1999. Higgins Run (818E) Management Report, Section 02. Pennsylvania Fish and Boat Commission files. Division of Fisheries Management. Fisheries Management Area 8. Somerset, Pennsylvania.

Table 1. Water quality characteristics for Site 0201 (RM 0.13) of Section 02 of Higgins Run (818E), Somerset County; September 1993, June 1998, June 1999, and July 2000.

Characteristic	9/16/93	6/29/98	6/22/99	7/06/00
Water Temperature (°C)	16.0	14.5	12.0	13.5
pH (standard units)	7.7	7.7	7.8	7.7
Total Alkalinity (mg/l)	83	67	74	80
Total Hardness (mg/l)	444	324	396	356
Specific Conductance (umhos)	1,057	690	925	805
Total Dissolved Solids (mg/l)	790	464	622	536

Table 2. Fish species occurrence at Site 0201 (RM 0.13) of Section 02 of Higgins Run (818E), Somerset County; September 1993, June 1998, June 1999, and July 2000.

Common name	Scientific name	9/93	6/98	6/99	7/00
Brown trout	<i>Salmo trutta</i>	X	X	X	X
Rainbow trout - hatchery	<i>Oncorhynchus mykiss</i>				X
Bluntnose minnow	<i>Pimephales notatus</i>	X		X	
Blacknose dace	<i>Rhinichthys atratulus</i>	X	X	X	X
Creek chub	<i>Semotilus atromaculatus</i>	X	X	X	
White sucker	<i>Catostomus commersoni</i>	X	X	X	X
Northern hog sucker	<i>Hypentelium nigricans</i>	X			
Yellow bullhead	<i>Ameiurus natalis</i>		X	X	X
Brown bullhead	<i>Ameiurus nebulosus</i>	X			
Pumpkinseed	<i>Lepomis gibbosus</i>	X			
Bluegill	<i>Lepomis macrochirus</i>				X
Yellow perch	<i>Perca flavescens</i>	X			
Greenside darter	<i>Etheostoma blennioides</i>				X
Mottled sculpin	<i>Cottus bairdi</i>		X	X	X
Species Total		9	6	7	8

Table 3. Estimated abundance and biomass using the Zippin three-pass removal estimate in 1993 and the Petersen Mark-Recapture estimate in 1998, 1999, and 2000 for brown trout at Site 0201 (RM 0.13) of Section 02 of Higgins Run (818E), Somerset County; September 1993, June 1998, June 1999, and July 2000.

Length group (mm)	September 16, 1993		June 29, 1998		June 22, 1999		July 06, 2000	
	N/ha	Kg/ha	N/ha	Kg/ha	N/ha	Kg/ha	N/ha	Kg/ha
25	--	--	10	0.01	30	0.03	20	0.02
50	--	--	1,274	3.82	720	1.44	2,013	6.04
75	418	2.51	80	0.40	--	--	380	2.66
100	69	0.76	70	1.19	20	0.36	120	2.04
125	--	--	281	7.87	257	6.94	30	0.99
150	71	2.98	415	20.35	192	8.06	150	7.05
175	50	3.10	240	16.56	50	3.20	75	4.80
200	38	3.08	30	3.51	171	17.49	50	5.30
225	52	7.29	50	6.25	114	14.63	80	11.76
250	104	18.13	63	13.06	40	6.44	10	1.97
275	41	10.03	60	17.34	10	2.38	20	5.88
300	--	--	10	3.03	20	6.66	10	3.60
325	13	4.91	20	8.76	20	6.90	10	3.89
350	--	--	--	--	10	4.70	--	--
Total	856	52.79	2,603	102.15	1,654	79.23	2,968	56.00

DEP Stream Code: 45404

PA FISH AND BOAT COMMISSION
COMMENTS AND RECOMMENDATIONS

Higgins Run

DEC 07 1999

December 2, 1999

WATERPA Fish & Boat Commission
Division of Environmental Services

Somerset County

EXAMINED: June 1998 & June 1999

BY: Gary Smith and Rick Lorson

Bureau Director Action: ~~James~~ Delano R. Goff Date: 12-6-99

Division Chief Action: Richard A. Snyder Date: 12-2-99

WW Unit Leader Action: _____ Date: _____

CW Unit Leader Action: R. Thomas Greene Date: 12/2/99

CWU COMMENTS:

Higgins Run (818E), Section 02, was examined during June 1998 and June 1999 as part of a five year Federal Aid project to assess Class A wild trout fisheries.

Section 02 can be characterized as a small coldwater stream. A total of six fish species were recorded during the 1998 evaluation and seven fish species were recorded during the 1999 examination. An excellent Class A wild brown trout fishery was documented during both 1998 (102.15 kg/ha) and 1999 (79.23 kg/ha). Each of these estimates exceeded the estimated standing stock of wild brown trout that was recorded during the qualifying survey in 1993.

CWU RECOMMENDATIONS:

1. Higgins Run (818E), Section 02, should continue to be managed as a Class A wild brown trout fishery. Statewide regulations should apply with no stocking.
2. Section 02 should continue to be monitored on an annual basis as part of the Federal Aid project to assess Class A wild trout fisheries.
3. Due to the presence of a viable class A wild brown trout fishery, the DEP Water Quality Standards should be upgraded to HQ-CWF. The special protected use classification should be applied to the Higgins Run basin from the Coal Tipple at RM 1.37 downstream to the Mouth. A copy of this report should be forwarded to DEP via Environmental Services.

PENNSYLVANIA FISH AND BOAT COMMISSION
BUREAU OF FISHERIES
FISHERIES MANAGEMENT DIVISION
Fisheries Management Area 8

Higgins Run (818E) Management Report
Section 02
(Abstract)

Prepared by
Gary Smith and Rick Lorson

Date Sampled: June 1998 & June 1999 Date Prepared: November 1999

Higgins Run is a 5.0 km coldwater stream located near Stoystown, PA in northcentral Somerset County and is a tributary to Quemahoning Reservoir. Section 02 of Higgins Run begins at the coal tipple (River Mile [RM] 1.37) and extends 2.2 km to the mouth at Quemahoning Reservoir (RM 0.00) (Figure 1). The purpose of a Pennsylvania Department of Environmental Resources survey of Higgins Run in 1981 was to investigate the potential impacts of the Stone Bridge bore hole discharge and to collect background data prior to a proposed coal storage pile at an active deep mine about 0.75 miles upstream of the mouth (Hughey 1982). Hughey (1982) concluded that no harmful chemical characteristics were detected in the Stone Bridge bore hole discharge, but fish and benthic macroinvertebrate communities below the Stone Bridge bore hole discharge seemed limited by a slightly acid or toxic condition. The active deep mine has been around since the 1970s and discharges treated water into Higgins Run. The Department of Environmental Protection Chapter 93 designation for Higgins Run is Cold Water Fishes (CWF) (Pennsylvania Department of Environmental Protection 1998).

The last survey of Higgins Run by the Pennsylvania Fish and Boat Commission (PFBC) was conducted in 1993 (Lorson and Miko 1994). Total brown trout biomass was estimated at a Class A level of 54.43 kg/ha for Section 02 in 1993. Lorson and Miko (1994) concluded that the Stone Bridge bore hole alkaline discharge negatively affected the aquatic life in Higgins Run because only five brown trout were collected at a 200 m site in 1993 from Section 01. They stated that without this impact there would likely be more brown trout in Higgins Run and the brown trout would be farther upstream.

The June 1998 and June 1999 surveys of Higgins Run are part of a five year (1998-2002) statewide study to evaluate Class A wild trout waters. One site in Section 02, at the same location as the 1993 site, will be sampled on an annual basis. Site 0201 was

located 200 m downstream from SR 4021 bridge at RM 0.13 (Figure 1). Brown trout abundance and biomass were estimated using the Petersen Mark-Recapture method. Fish sampling was accomplished with a Coffelt model BP-1C backpack electrofisher operated at 100 volts AC and 150 watts for 210 meters. The assessment at Site 0201 was conducted on June 29 and July 02 of 1998, and June 22 and June 23 of 1999 according to *Procedures for Stream and River Inventory Information Input* (Marcinko et al. 1986).

The water quality at Site 0201 had remained consistent from 1993 to 1999 (Table 1). The pH was 7.7 in 1998 and 7.8 in 1999. Mean total alkalinity from 1998 and 1999 was 71 mg/l and mean total hardness was 360 mg/l.

Habitat at Site 0201 was fair, but bank erosion and sedimentation were excessive. Trees provided partial to dense shading and overhanging shrubs and woody debris provided excellent cover. The streambanks were moderately to heavily eroded. Silt and rubble were the major substrate types. The silt problem may be limiting brown trout reproduction and benthic macroinvertebrate abundance and is probably caused by the eroded stream banks, runoff from the coal storage facility, and recent timbering in the upper watershed. Flow was normal in 1998 and low in 1999. Mean width was 4.9 meters in 1998.

Six species of fish were collected in 1998 compared to seven species in 1999 (Table 2). Total wild brown trout biomass at Site 0201 increased from 1993 and was estimated at a Class A level of 102.15 kg/ha in 1998 and 79.23 kg/ha in 1999 (Table 3). From the 1993 brown trout age data, mean backcalculated length to last annulus at age 1 was 110 mm, 210 mm at age 2, and 303 mm at age 3. Using this information to compare 1998 and 1999 estimates, age-0 fish are 0-99 mm, age-1 fish are 100-199 mm, age-2 fish are 200-299 mm, and age-3 and older fish are greater than 300 mm.

The 22% decrease in biomass from 1998 to 1999 could be linked to the 1998 drought. A PFBC drought study found that wild brown trout biomass declined 24-85% following a drought (Greene and Weber 1993). However, the Class A Wild Brown Trout waters used in the study remained at the Class A level as did Higgins Run in 1999. In 1998, age 0 (1998 year class), age 1 (1997 year class), and age 2 (1996 year class) were strong year classes. In 1999, the biomass estimates from the age-0 (1999 year class) and age-1 (1998 year class) fish were less than in 1998. The strong 1998 year class appeared to experience high mortality from June 1998 to June 1999 (estimated mortality of 62%). Drought conditions in the fall of 1998 probably reduced the young-of-the-year habitat and forced the small trout into adult habitat. The 1998 drought conditions may also have reduced the amount of spawning habitat; hence, a weaker age-0 year class in 1999.

Management Recommendations

1. Total wild brown trout biomass at Site 0201 increased from 1993 and was estimated at a Class A level of 102.15 kg/ha in 1998 and 79.23 kg/ha in 1999. Continue to manage Higgins Run, Section 02, as a Class A Wild Brown Trout water.
2. Resurvey Higgins Run, Section 02, in the years 2000, 2001, and 2002 as part of a five year (1998-2002) statewide study to evaluate Class A wild trout waters.
3. Habitat at Site 0201 was fair, but bank erosion and sedimentation were excessive. The silt problem may be limiting brown trout reproduction and benthic macroinvertebrate abundance and is probably caused by the eroded streambanks, runoff from the coal storage facility, and recent timbering in the watershed. A copy of this report should be sent to Dave Steele, Somerset County Conservation District, 1590 North Center Avenue, Suite 103, Somerset, PA 15501.
4. A copy of this report should be sent to Tom Proch, Aquatic Biologist, Pennsylvania Department of Environmental Protection, 400 Water Front Drive, Pittsburgh, PA 15222.

Literature Cited

- Greene, R.T., and R.J. Weber. 1993. Pennsylvania Fish and Boat Commission statewide 1991 drought study analysis. Pennsylvania Fish and Boat Commission files. Division of Fisheries Management. Bellefonte, Pennsylvania.
- Hughey, R. 1982. Aquatic biological investigation of Higgins Run, Somerset County, PA. DER Bureau of Water Quality Management, Lewistown Field Office, Lewistown, PA.
- Lorson, R., and D. Miko. 1994. Higgins Run (818E) Management Report, Sections 01 and 02. Pennsylvania Fish and Boat Commission files. Division of Fisheries Management. Fisheries Management Area 8. Somerset, Pennsylvania.
- Marcinko, M.T., R.D. Lorson, and R. Hoopes. 1986. Procedures for stream and river inventory information input. Pennsylvania Fish and Boat Commission files. Division of Fisheries Management. Fisheries Management Area 8. Somerset, Pennsylvania.
- Pennsylvania Department of Environmental Protection. 1998. Department of Environmental Protection Chapter 93. Water quality standards. Bureau of Watershed Conservation. Division of Water Quality Assessment and Standards. Harrisburg, Pennsylvania.

Table 1. Water quality characteristics for Site 0201 (RM 0.13) of Section 02 of Higgins Run (818E), Somerset County; September 1993, June 1998, and June 1999.

Characteristic	9/16/93	6/29/98	6/22/99
Water Temperature (°C)	16.0	14.5	12.0
pH (standard units)	7.7	7.7	7.8
Total Alkalinity (mg/l)	83	67	74
Total Hardness (mg/l)	444	324	396
Specific Conductance (umhos)	1,057	690	925
Total Dissolved Solids (mg/l)	790	464	622

Table 2. Fish species occurrence at Site 0201 (RM 0.13) of Section 02 of Higgins Run (818E), Somerset County; September 1993, June 1998, and June 1999.

Common name	Scientific name	9/93	6/98	6/99
Brown trout	<i>Salmo trutta</i>	X	X	X
Bluntnose minnow	<i>Pimephales notatus</i>	X		X
Blacknose dace	<i>Rhinichthys atratulus</i>	X	X	X
Creek chub	<i>Semotilus atromaculatus</i>	X	X	X
White sucker	<i>Catostomus commersoni</i>	X	X	X
Northern hog sucker	<i>Hypentelium nigricans</i>	X		
Yellow bullhead	<i>Ameiurus natalis</i>		X	X
Brown bullhead	<i>Ameiurus nebulosus</i>	X		
Pumpkinseed	<i>Lepomis gibbosus</i>	X		
Yellow perch	<i>Perca flavescens</i>	X		
Mottled sulpin	<i>Cottus bairdi</i>		X	X
Species Total		9	6	7

Table 3. Estimated abundance and biomass using the Zippin three-pass removal estimate in 1993 and the Petersen Mark-Recapture estimate in 1998 and 1999 for brown trout at Site 0201 (RM 0.13) of Section 02 of Higgins Run (818E), Somerset County; September 1993, June 1998, and June 1999.

Length	<u>September 16, 1993</u>		<u>June 29, 1998</u>		<u>June 22, 1999</u>	
	N/ha	Kg/ha	N/ha	Kg/ha	N/ha	Kg/ha
25	--	--	10	0.01	30	0.03
50	--	--	1,274	3.82	720	1.44
75	419	2.51	80	0.40	--	--
100	69	0.76	70	1.19	20	0.36
125	--	--	281	7.87	257	6.94
150	71	2.98	415	20.35	192	8.06
175	70	4.31	240	16.56	50	3.20
200	41	3.37	30	3.51	171	17.49
225	52	7.38	50	6.25	114	14.63
250	104	18.15	63	13.06	40	6.44
275	41	10.05	60	17.34	10	2.38
300	--	--	10	3.03	20	6.66
325	13	4.92	20	8.76	20	6.90
350	--	--	--	--	10	4.70
Total	880	54.43	2,603	102.15	1,654	79.23

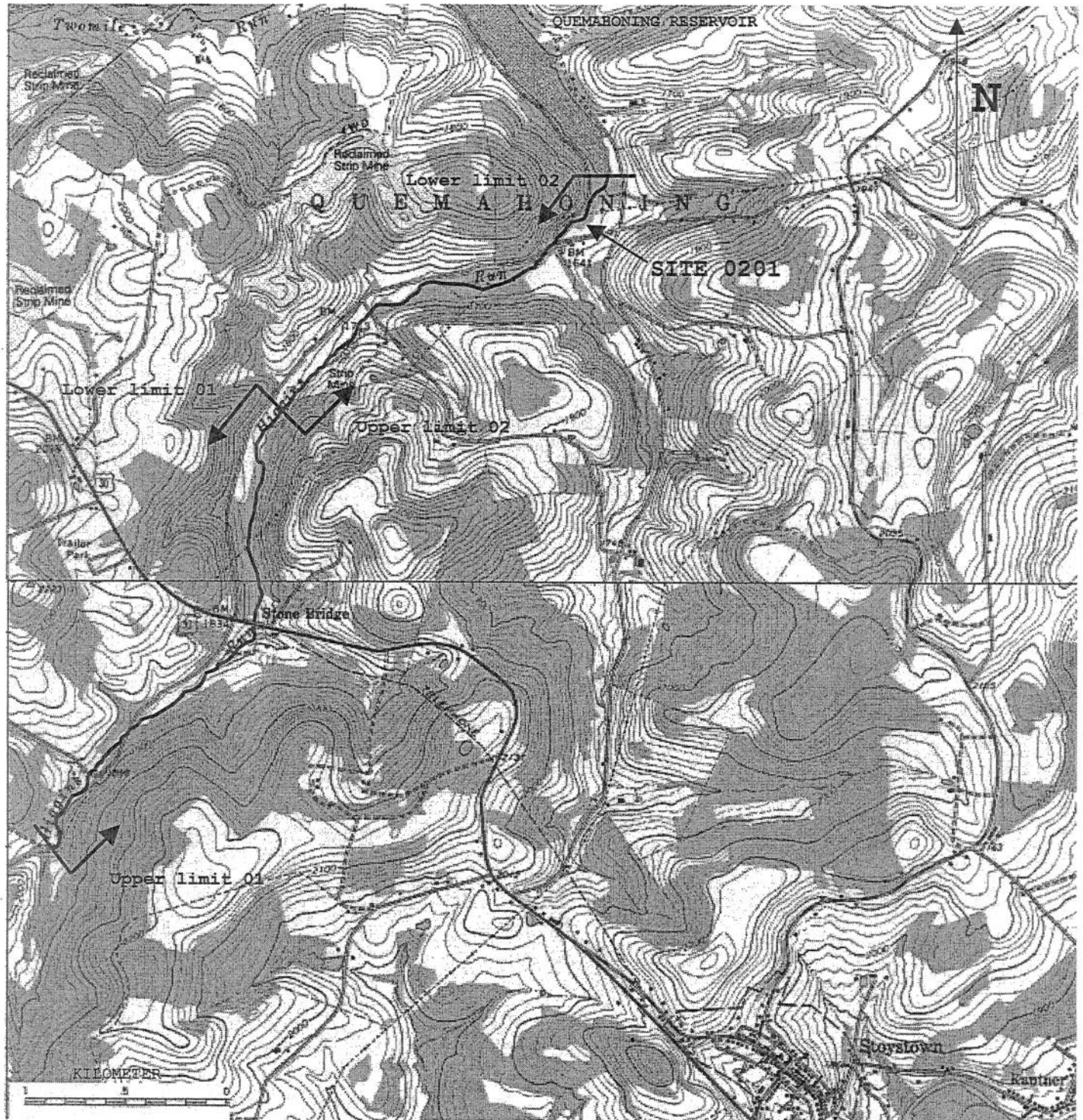


Figure 1. Site location and section limits for Section 02 of Higgins Run (818E), Somerset County; June 1998 and June 1999.