DEP Stream Code: 16503 **PA FISH AND BOAT COMMISSION** Halter Creek

COMMENTS AND RECOMMENDATIONS

February 16, 2012

WATER: Halter Creek (711A) Blair County

EXAMINED: July 2005

BY: Miko, Frederick, Greene, Weber, Wagner, Nihart

Bureau Director Action: _____Date: _____

Division Chief Action: _____Date: _____

CW Unit Leader Action: _____Date: _____

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AREA COMMENTS:

Halter Creek is a 12.8 km (7.9 mi) long stream located in sub-subbasin 11A, Freedom and Taylor townships, Blair County, and Bloomfield Township, Bedford County. Section 02 of Halter Creek was examined in May 2006 to further quantify and confirm spatial distribution of the wild brown trout population documented in 2004 and 2005.

Halter Creek is a limestone-influenced stream that receives sediment and additional nutrient loading from agricultural activities and stormwater runoff throughout its length. Improved land use practices including the use of stream bank fencing and stream buffers would be beneficial and should be considered.

Section 01 of Halter Creek supports a Class C wild brown trout population. Expansion of the trout population in this portion of the stream is limited by water temperature in the upper reaches of the section and marginal habitat including stream channelization in the lower reaches (Miko and Frederick 2005).

Section 02 of Halter Creek offers excellent angling opportunities for wild brown trout downstream of Plum Creek. Legal length ($\geq$ 175 mm TL) brown trout were documented at densities of 708 trout/km (1,139 trout/mi) with trout in excess of 500 mm (20 in) available in 2006. Wild brown trout biomass estimates from individual stations located in Section 02 ranged from 133.63 kg/ha to 237.75 kg/ha with a section average of 185.68 kg/ha. This represented an increase in the biomass estimate determined following the 2005 survey. Additionally, wild brown trout biomass estimates for fish < 150 mm (6 inches) ranged from 6.53 kg/ha to 18.66 kg/ha with an average of 12.58 kg/ha. This was slightly less than the 2005 average of 18.60 kg/ha. The reason for the decrease was likely the result of the early survey date making the identification and capture of small juvenile wild brown trout more difficult and natural variation in year class strength caused by changing environmental and habitat conditions.

The Section 02 wild brown trout biomass estimates exceeded the Pennsylvania Fish and Boat Commission's minimum criteria of total wild brown trout biomass

of 40 kg/ha and 0.1 kg/ha of brown trout less than 150 mm for classification as a Class A wild brown trout water. Documented Class A wild trout populations qualify for protection under the Pennsylvania DEP Chapter 93 Water Quality Standards High Quality – Cold Water Fishes (HQ-CWF) classification.

AREA RECOMMENDATIONS:

1. The Pennsylvania Fish and Boat Commission should manage Halter Creek as a Class A wild brown trout water - conventional statewide regulations should apply with no stocking.

2. The Pennsylvania Department of Environmental Protection should upgrade the Chapter 93 Water Quality Standards for Halter Creek from Warmwater Fishes to High-Quality Coldwater Fishes based upon the presence of a reproducing wild brown trout population in Section 01 and a Class A wild brown trout population in Section 02.

3. The Blair and Bedford County Conservation Districts should educate the landowners along Halter Creek about the benefits of stream bank fencing and riparian buffers and work with the landowners in accomplishing these tasks.

DIVISION CHIEF COMMENTS:

I agree with the recommendations of this report. In addition, habitat restoration should be considered for this drainage by the Dam Removal and Habitat Management Section of the Pennsylvania Fish and Boat Commission.

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

Pennsylvania Fish and Boat Commission
Bureau of Fisheries
Fisheries Management Division

Halter Creek (711A)
Fisheries Management Report

Prepared by
D. Miko

Fisheries Management Database Name: Halter Ck
Lat/Lon: 40°22'39" / 78°25'21"

Date Sampled: May 2006 Date Prepared: June 2006

Introduction

Halter Creek is a 12.8 km (7.9 mi) long stream located in sub-subbasin 11A. The stream is located in Freedom and Taylor townships, Blair County and Bloomfield Township, Bedford County. Halter Creek begins at approximately 421 m (1,380 ft) elevation, approximately 6 km (3.7 miles) south of Roaring Spring, Pennsylvania. The stream flows north toward Roaring Spring before turning northwest to its confluence with the Frankstown Branch Juniata River near Leamersville, Pennsylvania at River Mile (RM) 40.73, 40°22'39" Latitude and 78°25'21" Longitude. Map coverage is provided by the Roaring Spring and Hollidaysburg Pennsylvania, United States Geological Survey 7.5 minute Quadrangles (Fig. 1).

The Pennsylvania Department of Environmental Protection (DEP) Chapter 93 Water Quality Standards lists Halter Creek as Warm Water Fishes (WWF). The WWF designation provides protection for the maintenance and propagation of fish species and additional flora and fauna, which are indigenous to a warm water habitat.

Halter Creek is divided into two sections for fisheries management purposes. Section 01 is 9.17 km (5.7 mi) long and runs from the headwaters to the confluence of Plum Creek at RM 2.25. Section 02 is 3.62 km (2.25 mi) long and runs from the confluence of Plum Creek downstream to the mouth (Figs. 1 & 2). A more detailed introduction is available in (Miko and Frederick 2005).

Methods

The examination of Halter Creek was conducted from May 8 through May 9, 2006, to quantify the wild brown trout *Salmo trutta*

population documented in 2004 and 2005 and to confirm the spatial distribution of the Class A wild brown trout population within Halter Creek documented in 2005. All procedures were carried out according to those outlined by Marcinko et al. (1986). Two representative sampling stations totaling 20% of the section length were sampled in Section 02.

Physical characteristics, physicochemical values, and the fish communities were examined at both of the stations surveyed. The fish communities were sampled using either a backpack electrofisher equipped with a TAS generator and a Coffelt (BP-1C) variable voltage electrofisher set at 125 volts of alternating current or a towed boat electrofishing unit equipped with a Pow'r Gard model 1736DCV generator designed to deliver 125 volts of straight DC current. The physical characteristics of the station being surveyed dictated which sampling gear would be used. All fish captured were identified, recorded for species occurrence and released at the site of capture. Trout were measured and recorded in 25 mm (1.0 in) length groups with ten weights (g) per 25 mm length group recorded. All trout were given an identifying upper caudal fin clip during the initial electrofishing pass to facilitate a mark-recapture population estimate. Trout densities were determined by the Chapman modification of the Petersen estimator or M+C-R when R was less than three.

Results

Station 0201

Station 0201 was located at the Pennsylvania Department of Transportation bridge off of State Route 0036 at RM 2.05 (Table 1; Fig. 2). The 360 m long station averaged 10.2 m wide and closely paralleled SR 0036 for most of its length. Stream bank erosion was considered light within the survey station. However, rapid Bioassessment Protocols (RBP) ratings of embeddedness and sediment deposition were both in the suboptimal range (Table 2). The substrate consisted of boulder, rubble, and sand with some gravel also present. Tree-lined banks provided partial shading to the stream at this station. Flowing water habitat was comprised of short to medium length riffles up to 0.40 m deep, short pools up to 1.0 m deep, and short runs up to 0.75 m deep. The water depth in the pools, riffles, and runs; overhanging trees and shrubs; and some pocket water behind the boulder and rubble substrate provided habitat for adult fish (Miko and Frederick 2005). The RBP ratings for epifaunal substrate/available cover and velocity/depth regime were both rated optimal at this station (Table 2).

Physicochemical parameters and their associated values measured on May 8, 2006, were as follows: water temperature 11.4°C, specific conductance 450 umhos, total alkalinity 180 mg/l, and total hardness 232 mg/l. Dissolved oxygen concentration was 10.6 mg/l (Table 3).

A total of twelve fish species were captured at Station 0201 (Table 4). Fish common in a coldwater environment to fish common in a warmwater environment were collected. Bluegill *Lepomis macrochirus* and pumpkinseed *Lepomis gibbosus*, which are commonly associated with transitional or warmwater habitats were represented by a single individual of each species. Additionally, one koi *Cyprinus sp.* was also collected and presumed to be the result of a release or escape from a private individual.

A total of 622 individual wild brown trout were captured during two electrofishing passes in this 360 m station. Wild brown trout biomass and number of trout/ha were 133.63 kg/ha and 6,405 trout/ha, respectively (Table 5). Sub-legal length (< 175 mm TL) wild brown trout biomass was 54.96 kg/ha, which exceeded the 40 kg/ha requirement for Class A consideration.

Wild brown trout ranged in lengths from 25 mm TL to 399 mm TL with 139 fish (22.3%) being of legal length (175 mm; 7 in) or longer and 14 (2.3%) being 300 mm (12 in) or longer. The estimated number of legal length trout/mi was 895. Sixty-three trout/mi were $\geq$ 300 mm TL. Wild brown trout $\leq$ 74 mm TL (3 in) comprised 49.8% (n=310) of the wild brown trout collected at this station.

One hatchery reared brook trout and eleven hatchery reared brown trout were also collected at this station. Wild and hatchery brown trout were differentiated from one another by a combination of fin wear or deformities and to a lesser extent by differences in coloration of hatchery trout as compared to wild trout, with hatchery trout exhibiting a less vibrant coloration. In no instance was coloration used as the sole determining factor in differentiating hatchery brown trout from wild brown trout (Photos 1 & 2).

Station 0202

Station 0202 was located at the SR 0036 bridge at RM 0.25 (Table 1; Fig. 2). The 364 m long station averaged 9.05 m wide and was boarded by pastures, tree lined banks, and one rural residence. The tree-lined portions of the station provided partial shading to the stream. Although stream bank erosion was considered light within the surveyed station the RBP ratings of embeddedess and sediment deposition were both in the suboptimal range (Table 2). Stream substrate consisted primarily of rubble, gravel, and sand. A few boulders were also present at this station. Evidence of storm water runoff was apparent with gravel bars present along the inside stream bends and at the tail end of the pools (Miko and Frederick 2005).

Flowing water habitat at this station was comprised of short to medium length riffles up to 0.40 m deep, medium to long pools up to 1.25 m deep, and short runs up to 0.50 m deep. Habitat for adult fish was good and was provided by the water depth in pools, undercut banks, and overhanging trees, shrubs, and grasses (Miko

and Frederick 2005). The RBP ratings for epifaunal substrate/available cover and velocity/depth regime were both optimal (Table 2).

Physicochemical parameters and their associated values measured on May 09, 2006, were as follows: Water temperature 14.8°C, specific conductance 521 umhos, total alkalinity 170 mg/l, and total hardness 320 mg/l. Dissolved oxygen concentration was 11.4 mg/l (Table 3).

A total of eight fish species were captured at Station 0202 (Table 4). Fish common in coldwater and transitional environments were present in the fish community. Bluegill *Lepomis macrochirus*, and yellow bullhead *Ameiurus natalis*, typically associated with warmwater habitats were collected in 2005 and not in 2006.

A total of 353 individual wild brown trout were captured during two electrofishing passes in this 364 m station. Wild brown trout biomass and number of trout/ha were 237.75 kg/ha and 2,612 trout/ha, respectively (Table 6). Sub-legal length (< 175 mm TL) wild brown trout biomass was 77.48 kg/ha, which exceeded the 40 kg/ha requirement for Class A consideration.

Wild brown trout ranged in lengths from 25 mm TL to 524 mm TL with 218 fish (61.8%) being of legal length or longer and 32 (9.1%) being 300 mm or longer. The estimated number of legal length trout/mi was 1,391. One hundred sixty-one trout/mi were $\geq$ 300 mm TL. Wild brown trout $\leq$ 74 mm TL (3 in) comprised 1.1% (n=4) of the wild brown trout collected at this station. Twenty hatchery reared rainbow trout and nine hatchery reared brown trout were also collected at this station.

A dense wild brown trout population was documented at both stations surveyed in Section 02 of Halter Creek. The mean Section 02 biomass estimate was 185.68 kg/ha (Table 7). In comparison, wild brown trout biomass was estimated at 162.38 kg/ha in 2005 and 112.93 kg/ha at one sample site within Section 02 in 2004 (Table 8). The increase in total wild brown trout biomass in Halter Creek documented during the 2006 survey was largely the result of the survival and movement of the large 2005 year class into the larger size groups. This large year class is evident on the length frequency histogram presented in Figure 3.

Discussion

Physicochemical values collected in Section 02 were indicative of the limestone geology found throughout the region. Total alkalinity and pH measurements indicated that the stream possessed sufficient buffering capacity against the effects of acid precipitation and runoff. Although stream bank erosion was considered light at the specific sampling stations surveyed, the RBP ratings reflected some impairment resulting from agricultural, rural, and suburban influences located throughout the watershed. As such, portions of

Halter Creek would benefit from stream bank fencing designed to restrict or control livestock access to the stream and increased riparian buffers to filter sediments from runoff.

The fish species diversity was similar between stations during the 2006 survey with the upstream station supporting 12 species and the downstream station supporting 8 species. Occurrences of a single individual koi and common carp plus the presence of fantail darter *Etheostoma flabellare* and hatchery brook trout *Salvelinus fontinalis* accounted for the increased fish species abundance at Station 0201. As was documented during the 2005 survey, mottled sculpin *Cottus bairidi* were collected only at Station 0202. The relative abundance of the fish species collected in Halter Creek was greatest for coldwater fish with wild brown trout comprising the majority of the catch.

The wild brown trout biomass estimates documented in Section 02 of Halter Creek during surveys conducted from 2004 through 2006 exceeded the Pennsylvania Fish and Boat Commission's minimum criteria (total biomass of 40 kg/ha and 0.10 kg/ha of brown trout less than 150 mm) for a Class A wild brown trout water. Furthermore, the biomass estimates of sub-legal length (< 174 mm; 7 in) at Station 0201 was 54.96 kg/ha and in and of itself exceeded the total Class A biomass criteria. Wild brown trout biomass estimates for fish < 150 mm (6 inches) ranged from 6.53 kg/ha to 18.66 kg/ha with an average of 12.58 kg/ha. This was slightly less than the 2005 average of 18.60 kg/ha. The reason for the decrease was likely the result of the early survey date making the identification and capture of small juvenile wild brown trout more difficult and natural variation in year class strength caused by changing environmental and habitat conditions.

The Commission is aware of past stocking efforts on the stream, as documented by the presence of stocked trout both in this and previous years. To create a similar adult trout population density to the wild trout density estimates for Section 02 of Halter Creek stocking at a rate of 299 trout/ac or 2,563 total adult trout would be necessary. The current Pennsylvania Fish and Boat Commission maximum stocked trout allocation rate for streams similar to Halter Creek is 250 trout/ac.

Low to moderate numbers of hatchery-reared trout including rainbow trout, brook trout, and brown trout were found throughout Section 02. As occurred in 2005, the greatest densities of hatchery-reared trout were documented at the downstream most station (0202). Following discussions with a landowner at this station, it was discovered that the landowner typically relocated hatchery reared adult trout captured from other nearby stocked streams into this station of Halter Creek. Additionally, the Blair County Chapter of Trout Unlimited annually stocks Halter Creek with adult trout from their cooperative trout nursery. According to information provided by the Blair County Chapter of Trout Unlimited approximately 1,500 adult brown trout ranging between 350 mm (14 in) and 400 mm (16 in)

were stocked in the vicinity of Station 0202 from 2000 through 2002. The club also stocked a total of approximately 955 adult brook and brown trout between 175 mm (7 in) and 200 mm (8 in) near the mouth of Halter Creek between 2004 and 2005. These are the most likely sources of the hatchery trout collected within Halter Creek.

Based upon the documented Class A wild brown trout resource in Section 02, the current DEP Chapter 93 designation of Warmwater Fishes is not sufficient to protect the documented coldwater fish species assemblage present in Halter Creek. To provide adequate protection to this resource, the Pennsylvania DEP should consider a Chapter 93 upgrade to High-Quality Coldwater Fishes for the Halter Creek basin.

Management Recommendations

1. The Pennsylvania Fish and Boat Commission should continue to manage Halter Creek as a Class A wild brown trout water - conventional statewide regulations should apply with no stocking.

2. The Pennsylvania Department of Environmental Protection should consider an upgrade to the Chapter 93 Water Quality Standards for Halter Creek from Warmwater Fishes to High-Quality Coldwater Fishes based upon the presence of a reproducing wild brown trout population in Section 01 and a Class A wild brown trout population in Section 02.

3. The Blair and Bedford County Conservation Districts should educate the landowners along Halter Creek about the benefits of stream bank fencing and riparian buffers and work with the landowners in accomplishing these tasks.

Literature Cited

Marcinko, M., R. Lorson and R. Hoopes. 1986. Procedures for stream and river inventory information input. Pennsylvania Fish and Boat Commission publication, Bellefonte, PA.

Miko, D.A. and J.R. Frederick. 2005. Halter Creek (711A) Fisheries Management Report. Pennsylvania Fish and Boat Commission files. Big Spring, PA.

Table 1. Halter Creek (711A), Blair County. Station location, length electrofished, and average width in May 2006.

Station	Downstream limit description	Length (m)	Ave. Width (m)
0201	Penn DOT bridge off of State Route 0036	360	10.2
0202	State Route 0036 bridge	364	9.05

Table 2. Rapid Bioassessment Protocols rankings for Halter Creek (711A) stations 0201 and 0202, Blair County documented May 8, 2006.

Habitat Parameter	Rapid Bioassessment Protocol Rank	
	Station 0201	Station 0202
Epifaunal Substrate/Available Cover	Optimal	Optimal
Embeddedness	Suboptimal	Suboptimal
Velocity/Depth Regime	Optimal	Optimal
Sediment Deposition	Suboptimal	Suboptimal
Channel Flow Status	Optimal	Optimal
Channel Alteration	Suboptimal	Suboptimal
Frequency of Riffles or Bends	Suboptimal	Optimal
Left Bank Stability	Suboptimal	Suboptimal
Right Bank Stability	Suboptimal	Marginal
Left Bank Vegetative Protection	Optimal	Optimal
Right Bank Vegetative Protection	Suboptimal	Suboptimal
Left Bank Riparian Zone Width	Optimal	Optimal
Right Bank Riparian Zone Width	Suboptimal	Suboptimal

Table 3. Physicochemical parameters and their associated values measured in Halter Creek (711A) in May 2006.

	Station	
Parameter	**0201**	**0202**
Date	05/08/06	05/09/06
Time (24 hour)	940	1512
Air temperature (°C)	N/A	N/A
Water temperature (°C)	11.4	14.8
Specific conductance (umhos)	450	521
Total alkalinity (mg/l)	180	170
Total hardness (mg/l)	232	320
Dissolved oxygen (mg/l	10.64	11.39

Table 4. Fish species occurrence in Halter Creek (711A) determined by backpack and towed boat electrofishing in May 2006.

Scientific name	Common name	Station 0201	Station 0202
Oncorhynchus mykiss	Rainbow trout – hatchery		X
Salmo trutta	Brown trout – wild	X	X
Salmo trutta	Brown trout – hatchery	X	X
Salvelinus fontinalis	Brook trout – hatchery	X	
Cyprinus carpio	Common carp	X	
Rhinichthys atratulus	Blacknose dace	X	X
Rhinichthys cataractae	Longnose dace	X	X
Catostomus commersoni	White sucker	X	X
Ambloplites rupestris	Rock bass	X	X
Lepomis gibbosus	Pumpkinseed	X	
Lepomis macrochirus	Bluegill	X	
Cottus bairdi	Mottled sculpin		X
Exoglossum maxillingua	Cutlips minnow	X	X
Etheostoma flabellare	Fantail darter	X	
Cyprinus sp.	Koi	X	
Total species		**12**	**8**

Table 5. Estimated abundance and biomass of wild brown trout from Halter Creek (711A), using a Petersen estimator. Station located at River Mile 2.05 (Station 0201) with a station Lat/Lon of 402124/782451. Station currently located within section 2. Survey Date: 5/8/2006.

Size Group	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
25	1206	492	3014	3284	4.28	3350
50	545	327	965	1184	2.97	1514
100	4			11	0.16	11
125	125	78	213	340	11.25	347
150	272	146	556	741	36.30	756
175	69	38	139	188	14.65	192
200	20	9	46	54	6.26	56
225	48	26	99	131	18.30	133
250	31	14	78	84	15.28	86
275	18	7	45	49	11.38	50
300	9			25	6.56	25
325	1			3	0.98	3
350	3			8	3.68	8
375	1			3	1.58	3
Totals:	2352			6405	133.63	6534

Table 6. Estimated abundance and biomass of wild brown trout from Halter Creek (711A), using a Petersen estimator. Station located at River Mile 0.25 (Station 0202) with a station Lat/Lon of 402224/782523. Station currently located within section 2. Survey Date: 5/8/2006.

Size Group	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
25	1			3	0.00	3
50	3			9	0.03	8
100	2			6	0.09	5
125	64	26	159	194	6.41	176
150	477	225	1100	1448	70.95	1310
175	111	68	192	337	26.29	305
200	25	10	62	76	8.74	69
225	36	19	75	109	15.30	99
250	63	41	100	191	34.61	173
275	43	23	89	131	30.30	118
300	13	6	30	39	10.56	36
325	9	4	21	27	9.71	25
350	7	3	15	21	9.59	19
375	4			12	6.07	11
400	1			3	2.00	3
425	1			3	2.88	3
500	1			3	4.22	3
Totals:	861			2612	237.75	2366

Table 7. Mean abundance statistics for wild brown trout from Halter Creek (711A), Blair County, using a Petersen estimator. A total of 2 stations located within Section 2 were used in this analysis. Survey Date: 5/8/2006.

Size Group	Population Estimate	Sites Averaged	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
25	604	2	1644	2.14	1676
50	274	2	747	1.49	761
100	3	2	8	0.13	8
125	95	2	267	8.82	262
150	375	2	1094	53.63	1033
175	90	2	262	20.47	248
200	23	2	65	7.50	62
225	42	2	120	16.80	116
250	47	2	138	24.95	130
275	31	2	90	20.83	84
300	11	2	32	8.57	30
325	5	2	15	5.35	14
350	5	2	15	6.63	14
375	3	2	7	3.83	7
400	1	2	2	1.00	1
425	1	2	2	1.44	1
500	1	2	2	2.10	1
Totals:	1611		4510	185.68	4448

Table 8. Mean biomass estimates for wild brown trout from Halter Creek (711A), Blair County, using a Petersen estimator. Estimates are for survey years 2004, 2005, and 2006. One station was sampled in 2004 while two stations were sampled in 2005 and 2006.

Size Group	Estimated Number/Ha			Estimated Kg/Ha		
	2004	2005	2006	2004	2005	2006
25	9	0	1644	0.03	0.00	2.14
50	2865	286	747	8.61	0.86	1.49
75	70	1968	0	0.37	16.62	0.00
100	0	98	8	0.00	1.08	0.13
125	0	1	267	0.00	0.04	8.82
150	3	8	1094	0.12	0.44	53.63
175	34	115	262	2.45	9.18	20.47
200	141	357	65	14.80	37.89	7.50
225	86	211	120	12.78	34.08	16.80
250	86	56	138	18.01	10.07	24.95
275	77	37	90	20.22	8.55	20.83
300	37	51	32	12.65	15.95	8.57
325	9	10	15	3.80	3.96	5.35
350	18	21	15	9.62	9.74	6.63
375	6	9	7	3.46	5.35	3.83
400	3	6	2	2.21	4.10	1.00
425	0	2	2	0.00	1.38	1.44
450	0	0	0	0.00	0.00	0.00
475	3	0	0	3.80	0.00	0.00
500	0	0	2	0.00	0.00	2.10
575	0	1	0	0.00	3.09	0.00
Totals	3447	3237	4510	112.93	162.38	185.68

DEP Stream Code: 16503 Halter Creek

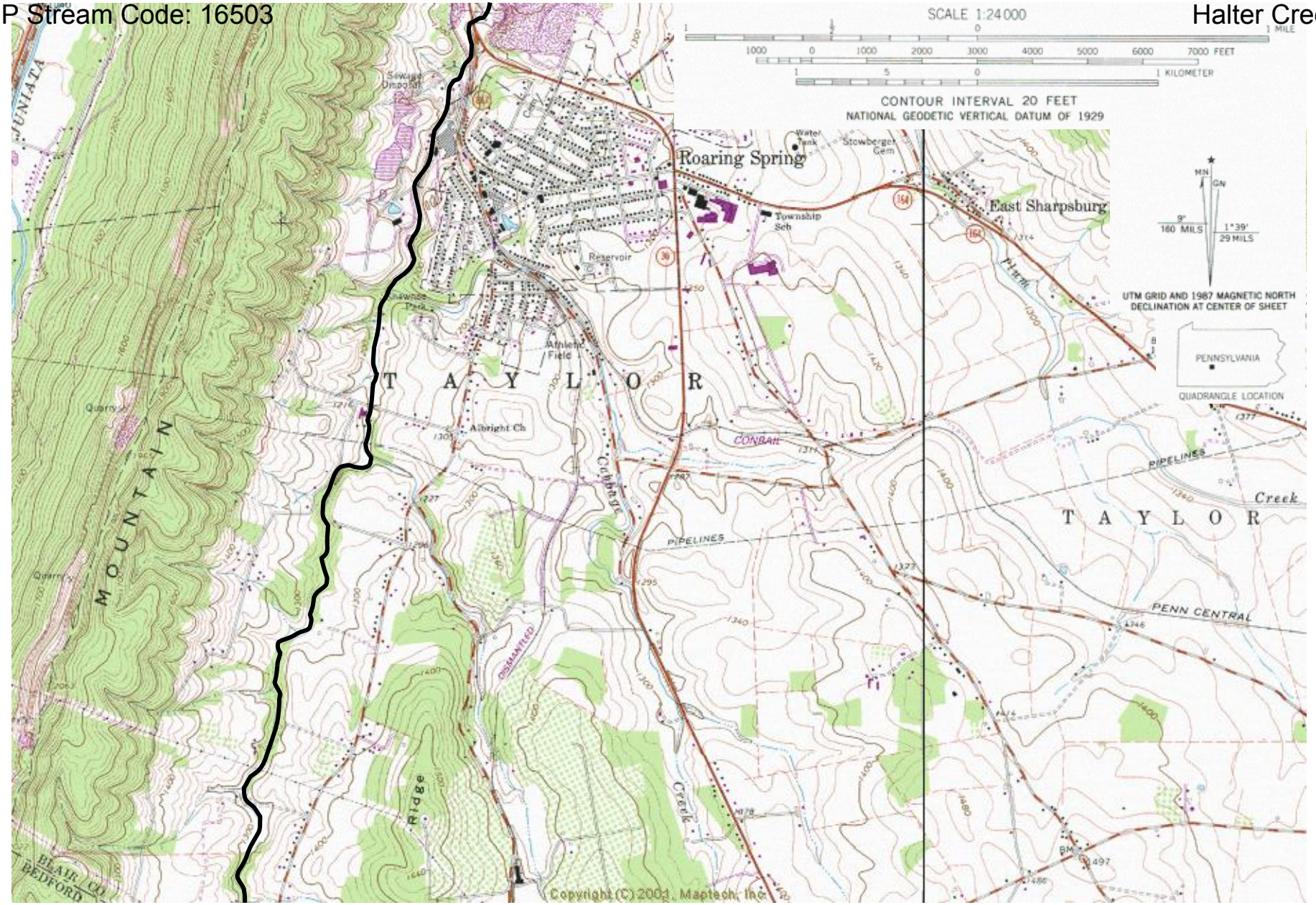

Figure 1. Location map for Halter Creek (11A), Blair County.

DEP Stream Code: 16503 Halter Creek

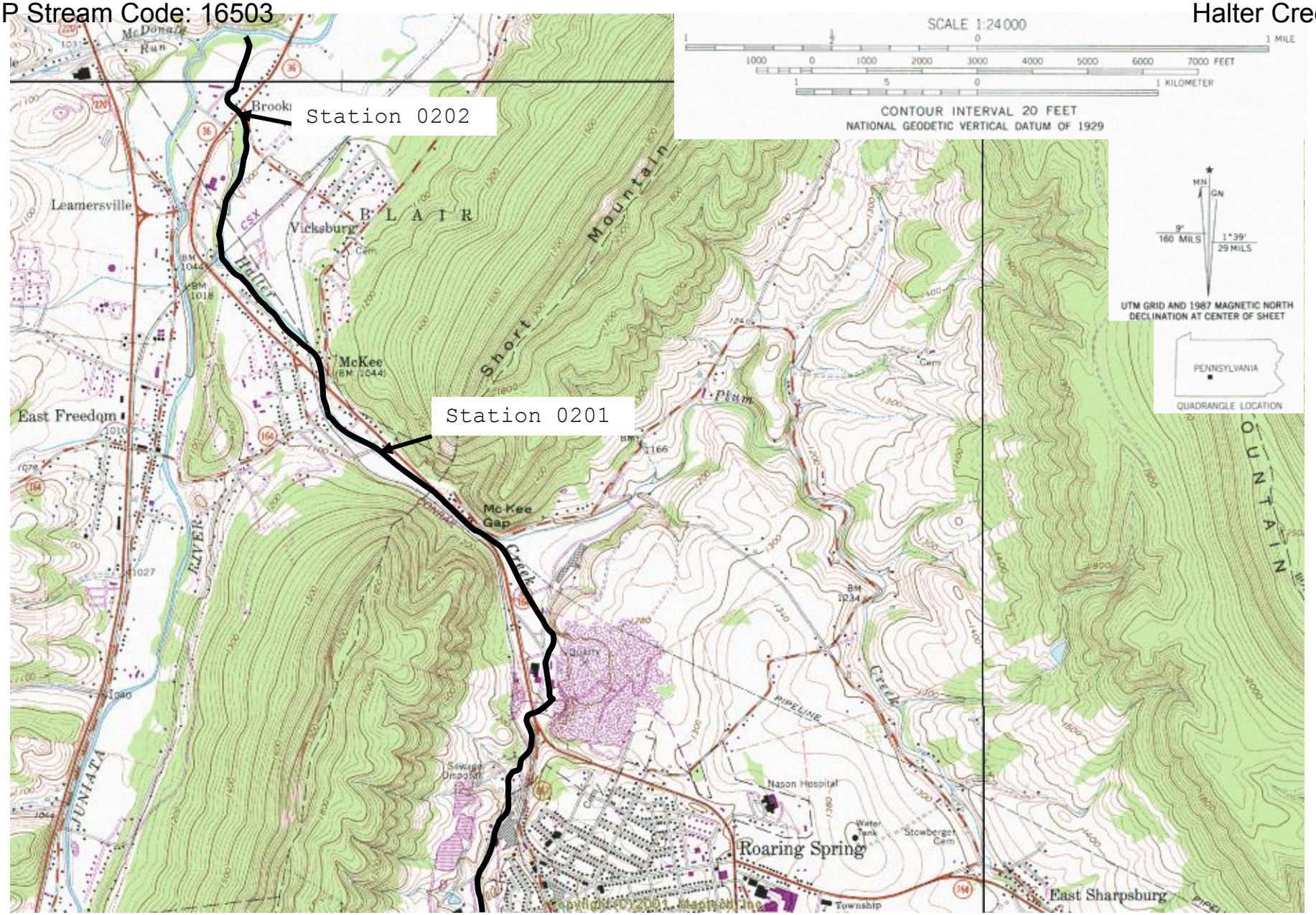

Figure 2. Location map for Halter Creek (11A), Blair County.

DEP Stream Code: 16503 Halter Creek

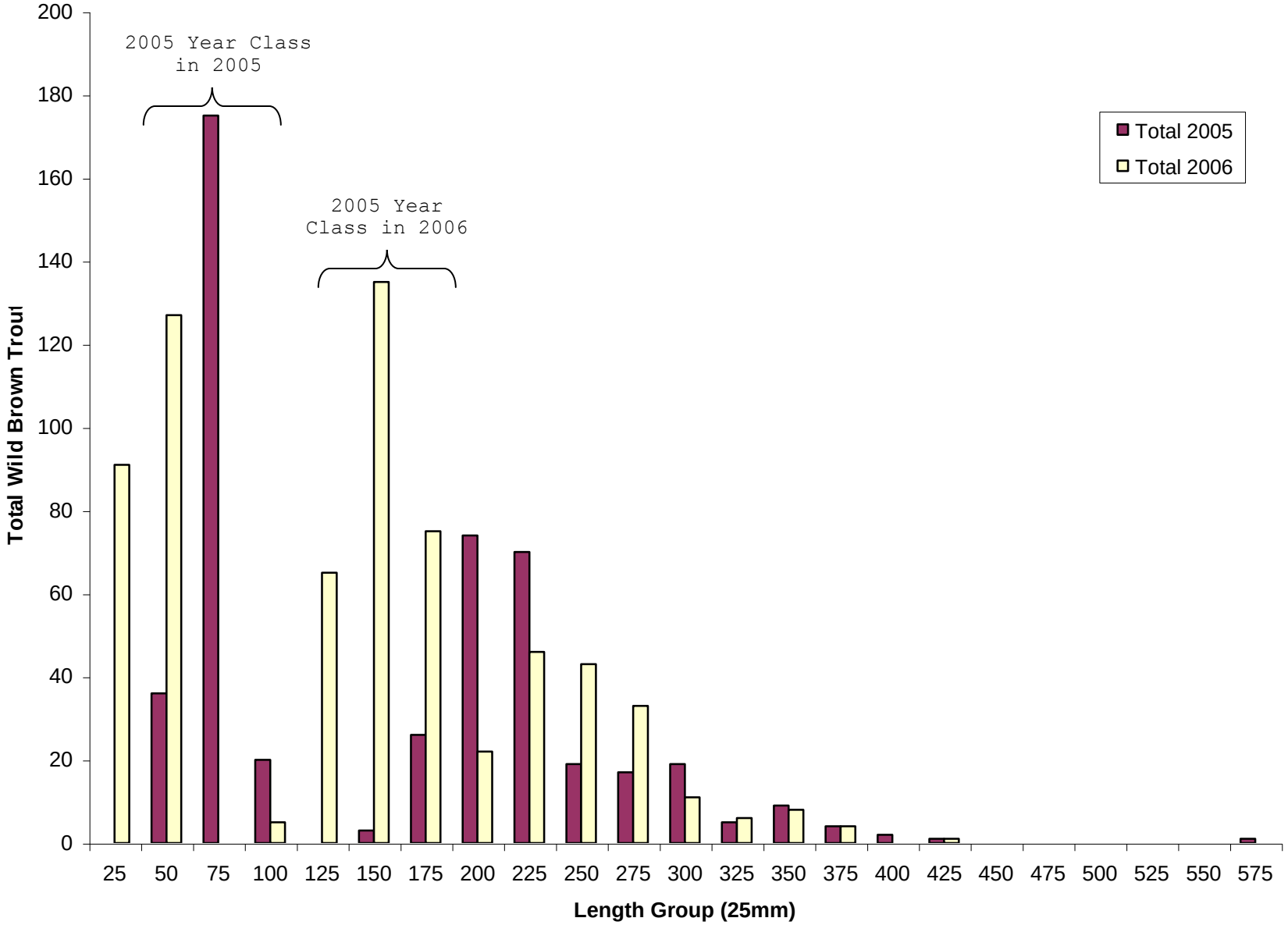

Figure 3. Total wild brown trout collected at stations 0201 and 0202 of Halter Creek (711A), Blair County during surveys conducted in 2005 and 2006.

Photo 1. Top fish identified as wild brown trout the bottom two fish were identified as hatchery reared brown trout. Identification keyed on curled pectoral fin, rounded caudal lobes, and coloration.

Photo 2. Four age 0+ wild brown trout collected from Halter Creek on May 9th, 2006.