

Distribution

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DEP Stream Code: 03333 PA FISH AND BOAT COMMISSION UNT to Delaware River
COMMENTS AND RECOMMENDATIONS
February 16, 2012

WATER: UNT to Delaware River (RM 179.27) (602D) Northampton County

EXAMINED: August 04, 2011

BY: Fisheries Management Area 6

Bureau Director Action: _____ Date: _____

Division Chief Action: _____ Date: _____

CW Unit Leader Action: _____ Date: _____

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AREA COMMENTS:

UNT to Delaware River (RM 179.27), located south of Easton and northwest of Raubsville, Northampton Co., was surveyed on August 4, 2011 in an attempt to further document that the stream supports a population of reproducing trout and meets the qualification for the statewide list of such waters. Multiple year classes of wild brown trout were collected and the total brown trout biomass was estimated to be 98.26 kg/ha, which met the Pennsylvania Fish and Boat Commission's minimum biomass criteria for a Class A wild brown trout population.

AREA RECOMMENDATIONS:

1. Recognize the UNT to Delaware River (RM 179.27) in its entirety as a stream that supports the natural reproduction of trout (Class A wild brown trout population).
2. Provide a copy of this report to the DEP for consideration of an upgrade to the Chapter 93 Water Quality Standards designation from Trout Stocking and Migratory Fishes to High Quality - Cold Water Fishes and Migratory Fishes based on the presence of a Class A wild brown trout population and several sensitive aquatic macroinvertebrate taxa. By the end of 2012 the agency should also investigate the stream to determine whether or not it qualifies as an EV candidate based on the presence of several sensitive aquatic macroinvertebrate taxa.
3. Provide a copy of this report to the Habitat Management Division for consideration to improving American eel passage to the UNT to Delaware River (RM 179.27) by modification of the culvert entrance under the Delaware Canal should grant monies become available or if an agreement can be reached with the Pa. Dept. of Natural Resources' Delaware Canal State Park. American eel were present during the survey, but not in the numbers that would be expected given the streams proximity to the Delaware River.

DEP Stream Code: 03333

UNT to Delaware River

4. The Northampton County Conservation District should work with landowners and future developers within the basin to implement best management practices for erosion and sediment pollution control.

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

UNT to Delaware River (RM 179.27) (602D)
Section 01
Fisheries Management Report
Unassessed Water

Prepared by
G. Murphy and M. Kaufmann

Fisheries Management Database Name: UNT to Delaware River (RM 179.27)
Lat/Lon: 40°38'47"/75°12'03"

Date Sampled: August 04, 2011 Date Prepared: August 24, 2011

Introduction

UNT to Delaware River (RM 179.27) is a 2.85 km (1.77 mi) long stream located in sub-subbasin 2D, Williams Township, Northampton County. UNT to Delaware River (RM 179.27) begins at approximately 183 m (600 ft) elevation, 3.2 km (2 mi) northwest of Raubsville, Pennsylvania. The stream flows northeast to its confluence with the Delaware River at River Mile (RM) 179.27, 40°38'47" latitude and 75°12'03" longitude. UNT to Delaware River (RM 179.27) can be found on the Easton NJ-PA, U.S. Geological Survey 7.5 minute quadrangle (Figure 1).

UNT to Delaware River (RM 179.27) has a 4.3 km² (1.66 mi²) drainage basin. Land use in the basin consists primarily of deciduous forests, meadows, and rural residences, including large estates with mowed fields. The underlying geology of the basin is the Leithsville Formation, which is comprised of crystalline dolomite, oolite, chert, thin shale and dolomite shale interbeds, and scattered sand grains.

The Pennsylvania Department of Environmental Protection (DEP) Chapter 93 Water Quality Standards lists UNT to Delaware River (RM 179.27) as Trout Stocking and Migratory Fishes (TSF, MF). The TSF designation provides protection for the maintenance of stocked trout from February 15 to July 31 and maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat. The MF designation

provides protection for the passage, maintenance, and propagation of anadromous and catadromous fishes and other fishes which move to or from flowing waters to complete their life cycle in other waters.

UNT to Delaware River (RM 179.27) was surveyed as part of the Unassessed Waters Program to gather baseline information on the resource for management purposes and to verify and document the presence of a reproducing population of trout. Knowledge of the presence of wild trout in streams is important in the proper permitting of land use activities and in the long-term restoration projects such as the Eastern Brook Trout Joint Venture.

Methods

The examination of UNT to Delaware River (RM 179.27) was conducted on August 04, 2011. All procedures were carried out according to those outlined by Weber (2011). One sampling station was chosen to be representative of Section 01.

Physical characteristics, physical-chemical parameters, aquatic macroinvertebrate communities, and fish communities were examined. Rapid bioassessment protocols (RBP) were used to assess habitat quality (Barbour et al. 1999). Aquatic macroinvertebrates were sampled qualitatively by hand picking or kick net and identified to lowest taxonomic level practical, typically family. Fish communities were sampled using a backpack electrofisher equipped with a TAS generator and a Coffelt (BP-1C) variable voltage electrofisher set at 75 volts of alternating current. All fish species were identified. Wild trout were measured and recorded in 25 mm (1.0 in) length groups. Site-specific average weights were calculated for each length group and used to generate the biomass estimate. Wild trout abundance and biomass were estimated using the Petersen method. Other fish species were assigned a subjective abundance index based on the number of individuals observed in 300 m of electrofishing. Scientific and common fish names were referenced in the Integrated Taxonomic Information System (<http://www.itis.gov>).

Results

Station 0101: Site River Mile 0.08

Station 0101 (RM 0.08) was located on the immediate upstream side of Route 611 and extended upstream 300 m. The station averaged 2.3 m in width and covered 11 percent of the section length (Table 1). This portion of the stream flowed primarily through a series of residential properties and a wooded greenbelt at some points. Bank erosion was moderate and the stream substrate consisted mainly of rubble, gravel, and sand.

Anthropogenic debris, such as concrete slabs, old dam ruins, and cinder blocks, was also present. The instream habitat included long, shallow riffles and a few short pocket pools approximately 0.3 m in depth. The stream channel was overly widened by stormwater effects to approximately three times the wetted width. The RBP assessment yielded a final score of 122 (Table 2).

Physical-chemical parameters and their associated values measured under normal flow conditions were as follows: air temperature 28.1°C, water temperature 18.8°C, specific conductance 248 umhos, pH 7.8 standard units, total alkalinity 84 mg/l, and total hardness 124 mg/l (Table 3).

Aquatic macroinvertebrate diversity was good with 21 taxa collected, including several sensitive taxa. The collection included three mayfly families, one stonefly family, and five caddisfly families. The pollution intolerant taxa collected included one mayfly genus (*Epeorus sp.*), one stonefly family (Leuctridae), and two caddisfly families (Glossosomatidae and Rhyacophilidae).

Nine fish species were captured at the site, including wild brown trout *Salmo trutta* and one wild brook trout *Salvelinus fontinalis*. Five stocked brook trout were also captured. Species composition and habitat preferences ranged from fish common in coldwater streams to fish common in an environment that is transitional between cold and warm water. Blacknose dace *Rhinichthys atratulus* and creek chub *Semotilus atromaculatus* were the most abundant fish species other than brown trout and were given a subjective abundance index rating of common and present, respectively. Juvenile and adult American eel *Anguilla rostrata* were also present (Table 5).

Brown Trout

Two-hundred forty-four wild brown trout ranging from 50 to 324 mm total length (TL) were captured during the survey with thirty-four (14 percent) being greater than or equal to the legal harvestable length (175 mm: 7 in). Total brown trout biomass was estimated to be 98.26 kg/ha. Brown trout abundance was estimated at 1,101 trout/km (1,773 trout/mi) with 127 trout/km (204 trout/mi) being of legal length or longer (Table 6). The number of legal size brown trout was between the 75th and 90th percentiles for legal brown trout abundance in Pennsylvania's wild brown trout streams while the abundance of nine inch and longer brown trout (48 trout/mile) was only slightly higher than the statewide median.

Discussion

Section 01 of UNT to Delaware River (RM 179.27) supported natural reproduction of brown trout and brook trout. The wild brown trout density determined from the survey met the Pennsylvania Fish and Boat Commission's minimum biomass criteria for a Class A wild brown trout population. The capture of a wild brook fingerling may indicate that brook trout inhabit upstream reaches of Section 01 or one of the small, un-named tributaries to UNT to Delaware River (RM 179.27). The fish may also have been a product of reproduction by hatchery brook trout that annually escape from a private pond into the stream.

The abundance of American eel was low given the proximity of the stream to the Delaware River. Approximately 40 m from the confluence with the Delaware River, UNT to Delaware River (RM 179.27) is piped through a culvert under Route 611 and the Delaware Canal. The culvert entrance is elevated above the river water surface and most likely presents a potential barrier for migratory fishes, such as American eel, under low to normal river flow conditions.

The current 25 PA Code Chapter 93 Water Quality Standards listing of Trout Stocking and Migratory Fishes for the UNT to Delaware River (RM 179.27) does not adequately protect the existing flora and fauna present within the basin. Due to the presence of a Class A wild brown trout population, the DEP should consider upgrading the designation to High Quality - Cold Water Fishes and Migratory Fishes (HQ-CWF, MF). The presence of several pollution intolerant macroinvertebrate taxa (e.g., *Epeorus* sp., Glossosomatidae, and Rhyacophilidae) provides additional support for this upgrade and a future DEP investigation to determine whether or not the stream would qualify for the Exceptional Value (EV) designation.

Management Recommendations

1. Recognize the UNT to Delaware River (RM 179.27) in its entirety as a stream that supports the natural reproduction of trout (Class A wild brown trout population).
2. Provide a copy of this report to the DEP for consideration of an upgrade to the Chapter 93 Water Quality Standards designation from Trout Stocking and Migratory Fishes to High Quality - Cold Water Fishes and Migratory Fishes based on the presence of a Class A wild brown trout population and several sensitive aquatic macroinvertebrate taxa. By the end of 2012 the agency should also investigate the stream to determine whether or not it qualifies as an EV candidate based on the presence of several sensitive

aquatic macroinvertebrate taxa.

3. Provide a copy of this report to the Habitat Management Division for consideration to improving American eel passage to the UNT to Delaware River (RM 179.27) by modification of the culvert entrance under the Delaware Canal should grant monies become available or if an agreement can be reached with the Pa. Dept. of Natural Resources' Delaware Canal State Park. American eel were present during the survey, but not in the numbers that would be expected given the streams proximity to the Delaware River.
4. The Northampton County Conservation District should work with landowners and future developers within the basin to implement best management practices for erosion and sediment pollution control.

Literature Cited

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid bioassessment protocols for use in wadeable streams and Rivers. USEPA. Report 814-99-002 Washington, DC

Weber, R.J. 2011. Sampling procedures for unassessed streams in Pennsylvania. Pennsylvania Fish and Boat Commission files, 450 Robinson Lane, Bellefonte, PA.

Table 1. UNT to Delaware River (RM 179.27) (602D), Northampton County. Site sampling location, length surveyed, average site width and site area.

Site Date	Rivermile	Downstream limit description	Length (m)	Ave. Width (m)	Site Area (ha)
8/4/2011	0.08	Site starts on upst side of 611 and extends upst 300 m	300	2.3	0.07

Table 2. High Gradient Rapid Bioassessment Protocol ratings for the UNT to Delaware River (RM 179.27) (602D), Northampton County conducted at RM 0.08 on August 04, 2011.

Habitat Parameter	Score	Habitat Parameter	Score
Epifaunal Substrate / Available Cover	12	Left Bank Stability	7
Embeddedness	13	Right Bank Stability	7
Velocity / Depth Regime	12	Left Bank Vegetative Protection	6
Sediment Deposition	10	Right Bank Vegetative Protection	6
Channel Flow Status	8	Left Bank Riparian Vegetative Width	6
Channel Alteration	14	Right Bank Riparian Vegetative Width	6
Frequency of Riffles or bends	15	Total Score	122

Table 3. Chemical parameters and their associated values in the UNT to Delaware River (RM 179.27) (602D), Northampton County. The sample site was within Section 01, Station 01, in 2011 sample year.

Parameter	Site 1
Site RM	0.08
Sample Date	08/04/2011
Time (24 hour)	1240
Water Temperature (C)	18.8
pH Field Colorimetric (SU)	7.8
Specific Conductance (UMHOS)	248
Total Alkalinity Field Mixed Indicator (MG/L)	84
Total Hardness Field EDTA (MG/L)	124
Air Temperature (C)	28.1

Table 4. Aquatic macroinvertebrate taxa collected at Station 0101 in UNT to Delaware River (RM 179.27) (602D), Northampton County.

Taxon	PTI
Ephemeroptera	
Baetidae	7
Ephemeridae	4
Heptageniidae	4
<i>Epeorus</i>	0
Plecoptera	
Leuctridae	1
Coleoptera	
Elmidae	8
Psephenidae	6
Trichoptera	
Glossosomatidae	0
Hydropsychidae	4-8
Polycentropodidae	6
Psychomyiidae	2
Rhyacophilidae	0
Odonata	
Aeshnidae	8
Calopterygidae	5
Diptera	
Other Chironomids	0-10
Simuliidae	0-10
Tipulidae	4
Hemiptera	
Gerridae	NA
Veliidae	NA
Amphipoda	
Gammaridae	2-8
Gastropoda	
Physidae	NA

X = Present at Station. PTI = Pollution Tolerance Index. PTI ranges from 0 (very intolerant of pollution) to 10 (very tolerant of pollution). NA = not available.

DEP Stream Code: 03333 occurrence and relative abundance of fish in the
 Delaware River (RM 179.27) (602D), Northampton County at Station
 0101 (RM 0.08) on August 04, 2011.

Common Name	Scientific Name	Subjective Abundance Index
American Eel	<i>Anguilla rostrata</i>	P
Blacknose Dace	<i>Rhinichthys atratulus</i>	C
Brook Trout	<i>Salvelinus fontinalis</i>	R
Brook Trout - Hatchery	<i>Salvelinus fontinalis</i>	P
Brown Trout	<i>Salmo trutta</i>	A
Creek Chub	<i>Semotilus atromaculatus</i>	P
Green Sunfish	<i>Lepomis cyanellus</i>	P
Longnose Dace	<i>Rhinichthys cataractae</i>	P
Margined Madtom	<i>Noturus insignis</i>	R
White Sucker	<i>Catostomus commersonii</i>	R

Subjective Abundance Index (based on a 300 m long station):

A = Abundant (> 100); C = Common (26 - 100); P = Present (3 - 25); R = Rare (< 3).

DEP Stream Code: 03333

UNT to Delaware River

Date: 08/04/2011 Trout Petersen abundance and biomass estimate
Station 0101, RM 0.08, on UNT to Delaware River (RM 179.27)
(602D), Northampton County, on August 04, 2011.

Size Group	Estimate	low95CI	High95CI	Num/Ha	Kg/Ha	Num/Km
50	80	50	133	1159	3.48	267
75	156	110	229	2261	11.76	520
100	2			29	0.54	7
125	22	11	48	319	8.77	73
150	32	20	51	464	18.37	107
175	21	12	42	304	18.84	70
200	8	4	18	116	11.42	27
225	3			43	6.07	10
250	3			43	7.78	10
275	2			29	7.14	7
300	1			14	4.09	3
Totals	330			4781	98.26	1101

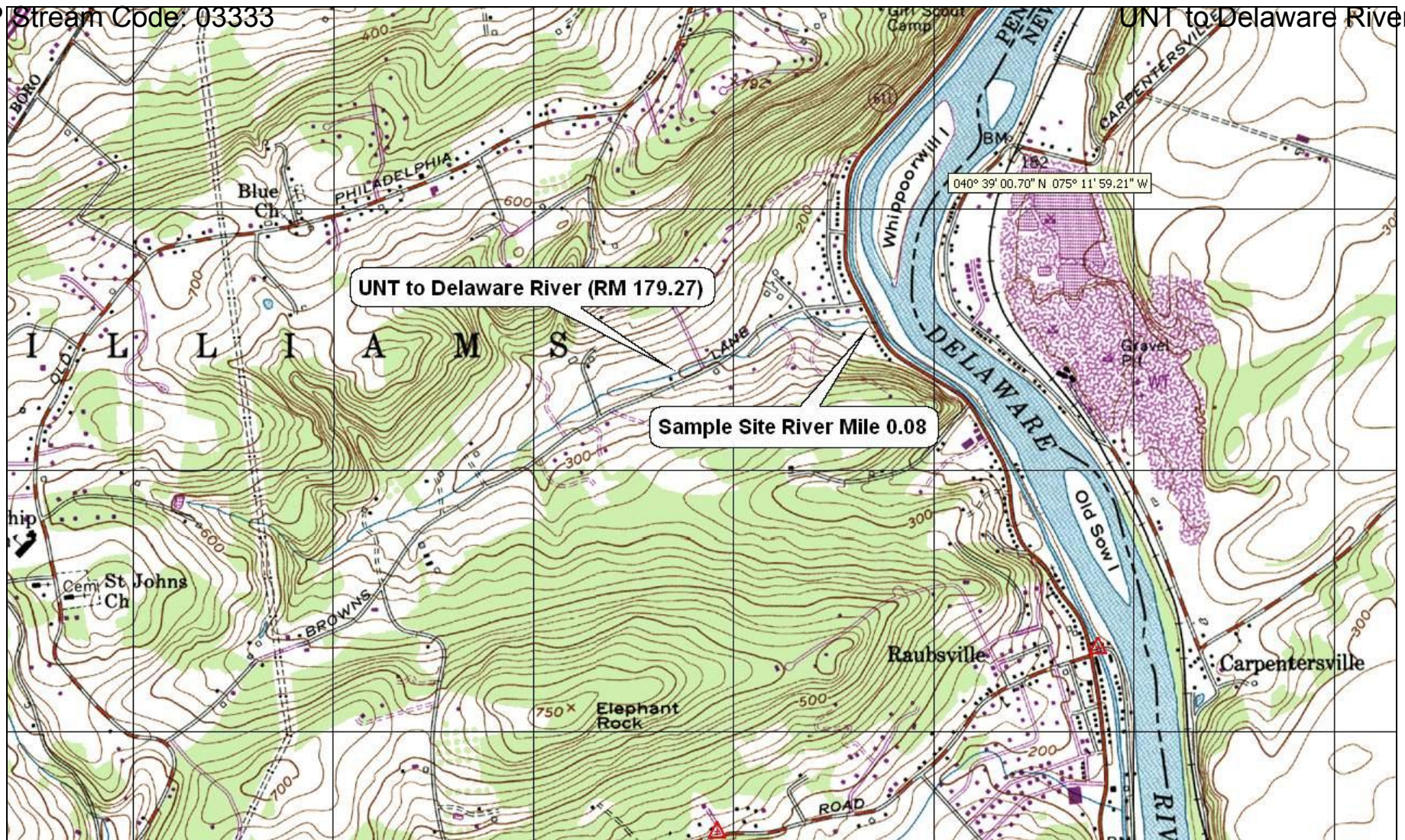


Figure 1. Location map for sample site river mile 0.08 on UNT to Delaware River (RM 179.27) (602D), Northampton County.