UNNAMED TRIBUTARY TO CONESTOGA RIVER

LANCASTER COUNTY

WATER QUALITY STANDARDS REVIEW

STREAM REDESIGNATION EVALUATION REPORT

Segment: Basin
Stream Code: 07792
Drainage List O

WATER QUALITY MONITORING SECTION (GLW)
DIVISION OF WATER QUALITY STANDARDS
BUREAU OF WATER STANDARDS AND FACILITY REGULATION
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JUNE 2007

INTRODUCTION

The Department conducted an evaluation of an unnamed tributary (Stream Code 07792) to Conestoga River (UNT Conestoga River) in response to a request by the Pennsylvania Fish and Boat Commission (PFBC). The current Chapter 93 designated use for the UNT Conestoga River is Warm Water Fishes (WWF). The PFBC requested that this stream be redesignated as Cold Water Fishes (CWF) based on survey data from August 21, 1996. This designated use evaluation is based on stream survey work conducted by DEP staff on April 30 and October 2, 2003.

GENERAL WATERSHED DESCRIPTION

The UNT Conestoga River, located northwest of Blue Ball, Pennsylvania, is a tributary to Conestoga River in the Susquehanna River drainage (Figure 1). The basin is a limestone creek located in Earl and East Earl Townships in Lancaster County and drains approximately 2.7 mi^2 and flows for 3.2 miles in a northwesterly direction from its origin in East Earl Township to its mouth at the village of Martindale. The surrounding area is characterized by relatively flat topography with some gently rolling hills of low relief.

There are significant impacts to the UNT Conestoga River basin from human activities. Land uses include agricultural activities and some residential development.

WATER QUALITY AND USES

Surface Water

No long-term water quality data were available to allow a direct comparison to water quality criteria. Since the instantaneous nature of grab samples precludes comparison to applicable water quality criteria, no chemical data were collected during this study, except for field pH, dissolved oxygen, temperature, and conductivity. Instead, biological data have been collected to evaluate the long-term water quality conditions of the UNT Conestoga River.

Water Quality. There are no permitted discharges (NPDES) or surface water withdrawals in the UNT Conestoga River basin. Potential for non-point source pollution is extremely high as the basin land use is dominated by agricultural activities that include row crops and cattle pasture with little or no stream buffering or fencing. Instream temperature (53.1 °F) and dissolved oxygen (11.0 mg/l) measured on April 30, 2003 were indicative of cold water conditions (Table 2). In addition, instream temperature (59.2 °F) measured on August 21, 1996 by PFBC staff was also indicative of cold water conditions (Table 2) and was less than the maximum CWF temperature criteria found in § 93.7 (Table 3).

Aquatic Biota

The indigenous aquatic community is an excellent indicator of long-term conditions and is used as a measure of both water quality and ecological significance. Department staff collected habitat, benthic macroinvertebrate, and fish data at station 1UNT on April 30 and October 2, 2003 (Figure 1, Table 1).

Habitat. The results of an instream habitat assessment conducted at station 1UNT is presented in Table 3. The habitat evaluation consists of rating twelve habitat parameters to derive a station habitat score. The habitat score total for the UNT Conestoga River was 100 – generally considered to reflect marginal habitat conditions.

Benthos. Benthic macroinvertebrate collection efforts employed the Department's PaDEP-RBP benthic sampling methodology, which is a modification of EPA's Rapid Bioassessment Protocols (RBPs; Plafkin, et al 1989 and Barbour, et al 1999). Since the purpose of the benthic collection was to characterize the water quality and determine the stream's basic aquatic life use, there was no comparison between UNT Conestoga River's benthic sample and a reference station.

The UNT Conestoga River supports a simple benthic macroinvertebrate population dominated by a number of pollution-tolerant genera. The macroinvertebrate sample revealed a relatively low taxa richness (total # of taxa) value of 10 (Table 4). The benthic sample was dominated by the tolerant taxonomic group Chironomidae. Based on subsample results, this group comprised about 55% of the benthos. This benthic community condition reflects impacts from the previously described land uses observed upstream.

A June 2006 Statewide Surface Water Assessment Program screening determined that this stream was impaired and therefore was listed on Pennsylvania's 2002 Clean Water Act 303(d) list of impaired waters. The impairment source and cause was listed for agriculture and nutrients, respectively.

Fish. The UNT Conestoga River fish populations were also sampled at station 1 UNT on October 2, 2003. Six species of fish were captured in 30 minutes of sampling a 100m section of UNT Conestoga River (Table 5). Most species collected are commonly found in warm water habitats and classified as pollution tolerant taxa. Additional fish data were available from a survey conducted on August 21, 1996 by the PFBC. The PFBC survey documented the presence of 5 fish species (Table 5), including one brook trout and sculpins, which are species associated with cold water conditions.

PUBLIC RESPONSE AND PARTICIPATION SUMMARY

The Department provided public notice of this stream designation evaluation and requested any technical data from the general public through publication in the Pennsylvania Bulletin on April 27, 2002 (32 Pa.B 2162). Similar notices were also published in the Intelligencer Journal and Lancaster New Era newspapers (Lancaster,

PA) on April 26, 2002. In addition, Earl and East Earl Townships and County of Lancaster Planning Commission were notified of the redesignation evaluation in a letter dated April 26, 2002. No data on water chemistry, instream habitat, or the aquatic community were received in response to these notices.

The UNT Conestoga River report and original recommendations (June 2007) to redesignate the stream as Cold Water Fishes (CWF) were posted on DEP's web page for public review and comment. Local municipalities, the Lancaster County Planning Commission, and the Lancaster Conservation District were notified of the web report availability by postal mail. No comments were received in response to this web posting.

RECOMMENDATIONS

As indicated by the available physical, benthic macroinvertebrate and fish data, the aquatic habitat found in the UNT Conestoga River supports a cold-water fishery. Based on these findings and applicable regulatory criteria for statewide water uses in 25 Pa Code § 93.4(a), the Department recommends that the UNT Conestoga River basin, from the source to the mouth, be redesignated Cold Water Fishes (CWF).

This recommendation adds approximately 3.2 stream miles of CWF waters to Chapter 93.

REFERENCES

Plafkin, JL, MT Barbour, KD Porter, SK Gross, & RM Hughes. 1989. Rapid Bioassessment Protocols for use in streams and rivers: Benthic Macroinvertebrates and Fish. United States Environmental Protection Agency. EPA/444/4-89-001.

Barbour, Michael T., Jeroen Gerritsen, Blaine D. Snyder, James B Stribling. 1999. Rapid Bioassessment Protocols For Us in Streams and Wadeable Rivers: Periphyton, Benthic Marcroinvertebrates, and Fish. Second Edition. United States Environment Protection Agency. EPA 841-B-99-002

Pennsylvania Fish & Boat Commission. 1997. UNT Conestoga Creek (607J) Fisheries Management August 21, 1996 Survey. File Information.

Figure 1
Station Locations
UNT Conestoga River
Lancaster County

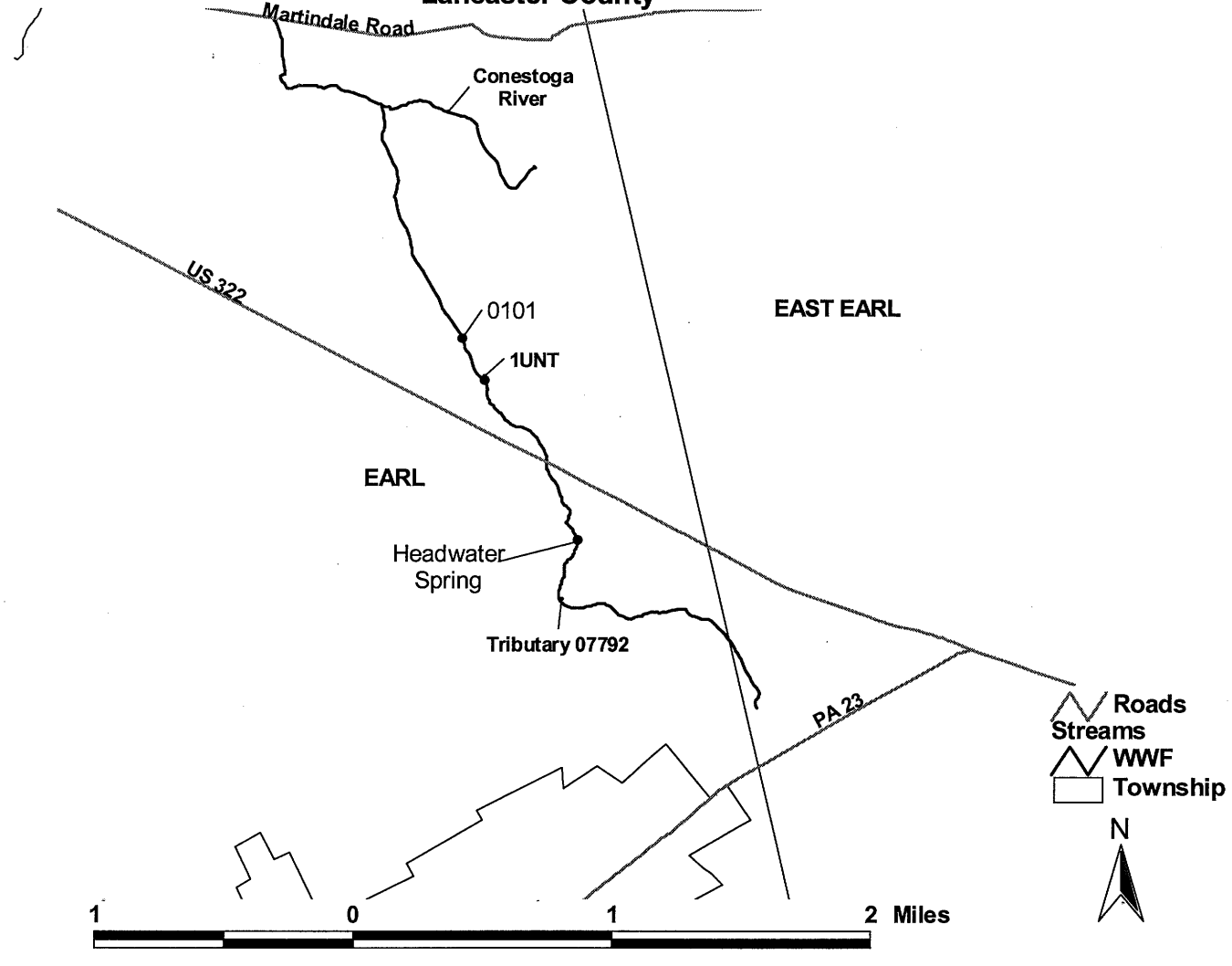

TABLE 1
STATION LOCATIONS
UNT CONESTOGA RIVER
LANCASTER COUNTY

STATION	LOCATION
0101	Downstream of private drive crossing located approximately 1 upstream of mouth. Earl Township, Lancaster County Stream Code 07792 Lat: 40° 08' 11" Long: 76° 05' 06" RMI: 0.96
1UNT	Upstream of private drive crossing located 1.2 miles upstream of mouth. Earl Township, Lancaster County Stream Code 07792 Lat: 40° 08' 01" Long: 76° 04' 59" RMI: 1.18
Headwater Spring	Upstream of US 322 approximately 0.34 miles. East Earl Township, Lancaster County Stream Code 07792 Lat: 40° 07' 30" Long: 76° 04' 36" RMI: 1.96

UNT = UNT Conestoga River

TABLE 2
FIELD WATER CHEMISTRY
UNT CONESTOGA RIVER
LANCASTER COUNTY
APRIL 30, 2003

PARAMETER	STATIONS[1]	
	1UNT	0101[2]
Temperature (°C)	11.7	15.1
pH (Field)	6.79	7.6
DO (mg/l)	11.0	Not Available
Conductivity (µS/cm)	783	590

[1]Refer to Figure 1 and Table 1 for station locations
[2]PFBC survey data August 21, 1996

TABLE 3
HABITAT ASSESSMENT SUMMARY
UNT CONESTOGA RIVER
LANCASTER COUNTY
APRIL 30, 2003

HABITAT PARAMETER	STATION[1] 1UNT
1. instream cover	8
2. epifaunal substrate	2
3. embeddedness	1
4. velocity/depth	11
5. channel alterations	13
6. sediment deposition	2
7. riffle frequency	8
8. channel flow status	20
9. bank condition	11
10. bank vegetative protection	11
11. grazing/disruptive pressures	11
12. riparian vegetation zone width	12
Total Score	100
Rating[2]	MAR

[1] Refer to Figure 1 and Table 1 for station location.
[2] MAR=Marginal

TABLE 4
SEMI-QUANTITATIVE BENTHIC MACROINVERTEBRATE DATA
UNT CONESTOGA RIVER, LANCASTER COUNTY
APRIL 30, 2003

TAXA	STATION[1] 1UNT
Ephemeroptera (mayflies)	
Baetidae; ***Baetis***	1
Trichoptera (caddisflies)	
Hydropsychidae; ***Cheumatopsyche***	19
Diptera (true flies)	
Chironomidae;	131
Empididae; ***Hemerodromia***	4
Simuliidae; ***Simulium***	10
Coleoptera (aquatic beetles)	
Elmidae; ***Dubiraphia***	26
Macronychus	1
Optioservus	23
Stenelmis	4
Non-Insect Taxa	
Amphipoda; ***Crangonyx***	21
Number of taxa in total sample	10

[1]Refer to Figure 1 and Table 1 for station location.

TABLE 5
FISHES
UNT CONESTOGA RIVER
LANCASTER COUNTY
OCTOBER 2, 2003

SPECIES NAME	STATION[1, 2, 3]		
	1UNT	0101[4]	Headwater Spring[4]
Sculpin, ***Cottus sp.***			A
Spotfin shiner, ***Cyprinella spiloptera***	X		
Blacknose dace, ***Rhinichthys atratulus***	X	A	
Creek chub, ***Semotilus atromaculatus***	X	C	
White sucker, ***Catostomus commersoni***	X	C	
Brook Trout, ***Salvelinus fontinalis***		R	
Bluegill, ***Lepomis marochirus***		R	
Green sunfish, ***Lepomis cyanellus***	X		
Largemouth bass, ***Micropterus salmoides***[5]	R		
TOTAL TAXA	6	5	1

[1]Refer to Figure 1 and Table 1 for station location.
[2]X = Present but abundance not recorded
[3] Letters refer to relative abundances: A = Abundant (>100); C = Common (26-100); P = Present (3-25); R = Rare (<3)
[4]PFBC survey data August 21, 1996
[5]Young of the year