

NEWTOWN CREEK

BUCKS COUNTY

**WATER QUALITY STANDARDS REVIEW
STREAM DESIGNATION EVALUATION REPORT**

**Segment: Basin
Stream Code: 02561
Drainage List E**

**WATER QUALITY MONITORING AND ASSESSMENT SECTION (APF)
DIVISION OF WATER QUALITY ASSESSMENT AND STANDARDS
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

APRIL 2004

INTRODUCTION

It was determined by the Department that during the compilation of Chapter 93, the Newtown Creek basin was not assigned a "designated use." The designated uses listed for the receiving Neshaminy Creek drainage segment is Warm Water Fishes (WWF) and Migratory Fishes (MF) but they do not include Newtown Creek. The purpose of this report is to review the information and data gathered during this investigation in order to determine the proper Chapter 93 designated use for Newtown Creek.

GENERAL WATERSHED DESCRIPTION

Newtown Creek is a tributary to Neshaminy Creek in the Delaware River drainage. The basin is located in Middletown, Newtown, and Wrightstown Townships and the Borough of Newtown in Bucks County. Newtown Creek is a freestone creek that drains approximately 6.3mi² and flows in a southerly direction. The surrounding area is characterized by relatively flat topography with some gently rolling hills of low relief. A section of Newtown Creek is impounded to create a flood control/recreation dam. This impoundment is owned by Bucks County and is located upstream of Route 532.

There are significant impacts to the Newtown Creek basin from human activities. Land uses include agricultural activities, residential developments, and the urban areas of Newtown. There are a significant amount of newly constructed subdivisions in the upper portions of the watershed.

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. Instead, biological data have been collected to evaluate the long-term water quality conditions of Newtown Creek.

Water Quality. There are five permitted groundwater withdrawals and one permitted industrial discharge within the Newtown Creek basin.

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 a single sampling location on January 24, 2002 (Figure 1).

Habitat. Instream habitat conditions were evaluated at the station where benthic macroinvertebrate and fish were sampled (Table 1). The habitat evaluation consists of rating twelve habitat parameters to derive a station habitat score. The habitat score total for Newtown Creek was 165 – generally considered to reflect sub-optimal habitat conditions.

Benthos. Benthic macroinvertebrate collection efforts employed the Department's PaDEP-RBP benthic sampling methodology. The PaDEP-RBP method is a modification of EPA's Rapid Bioassessment Protocols (RBPs; Plafkin, et al 1989). 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 Newtown Creek's benthic sample and a reference station.

Newtown Creek 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 13 (Table 2). Normally, in streams of this size, taxa richness scores > 20 can be expected. The benthic sample was dominated by the tolerant taxonomic group; chironomidae. Based on subsample results, this group comprised about 70% of the benthos. This benthic community condition reflects impacts from the previously described land uses observed upstream.

Fish. Newtown Creek fish populations were also sampled. Six species of fish were captured in 15 minutes of sampling a 100m section of Newtown Creek (Table 3). Abundance of fish was low with 47 total fish captured during sampling. All species collected are commonly found in warm water habitats and classified as pollution tolerant taxa.

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 22, 2000 (30 Pa.B 2071). A similar notice was also published in the Philadelphia Inquirer newspaper (Philadelphia, PA) on April 21, 2000. In addition, Newtown Township, Newtown Borough, and Bucks County Planning Commission were notified of the designation evaluation in a letter dated April 19, 2000. No data on water chemistry, instream habitat, or the aquatic community were received in response to these notices.

RECOMMENDATIONS

The biological data indicate that Newtown Creek supports a warm water fishery. Based on applicable regulatory criteria, the Department recommends that the entire Newtown Creek basin be designated Warm Water Fishes (WWF). Newtown Creek will also be designated Migratory Fishes (MF) since Newtown Creek is an unimpeded tributary to Neshaminy Creek, which is designated MF.

This recommendation adds approximately 9.2 stream miles of WWF and MF 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.

FIGURE 1. NEWTOWN CREEK WATERSHED BUCKS CO.

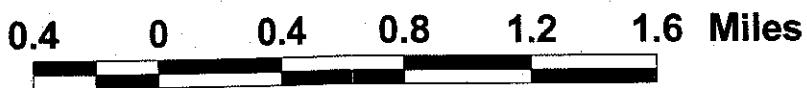
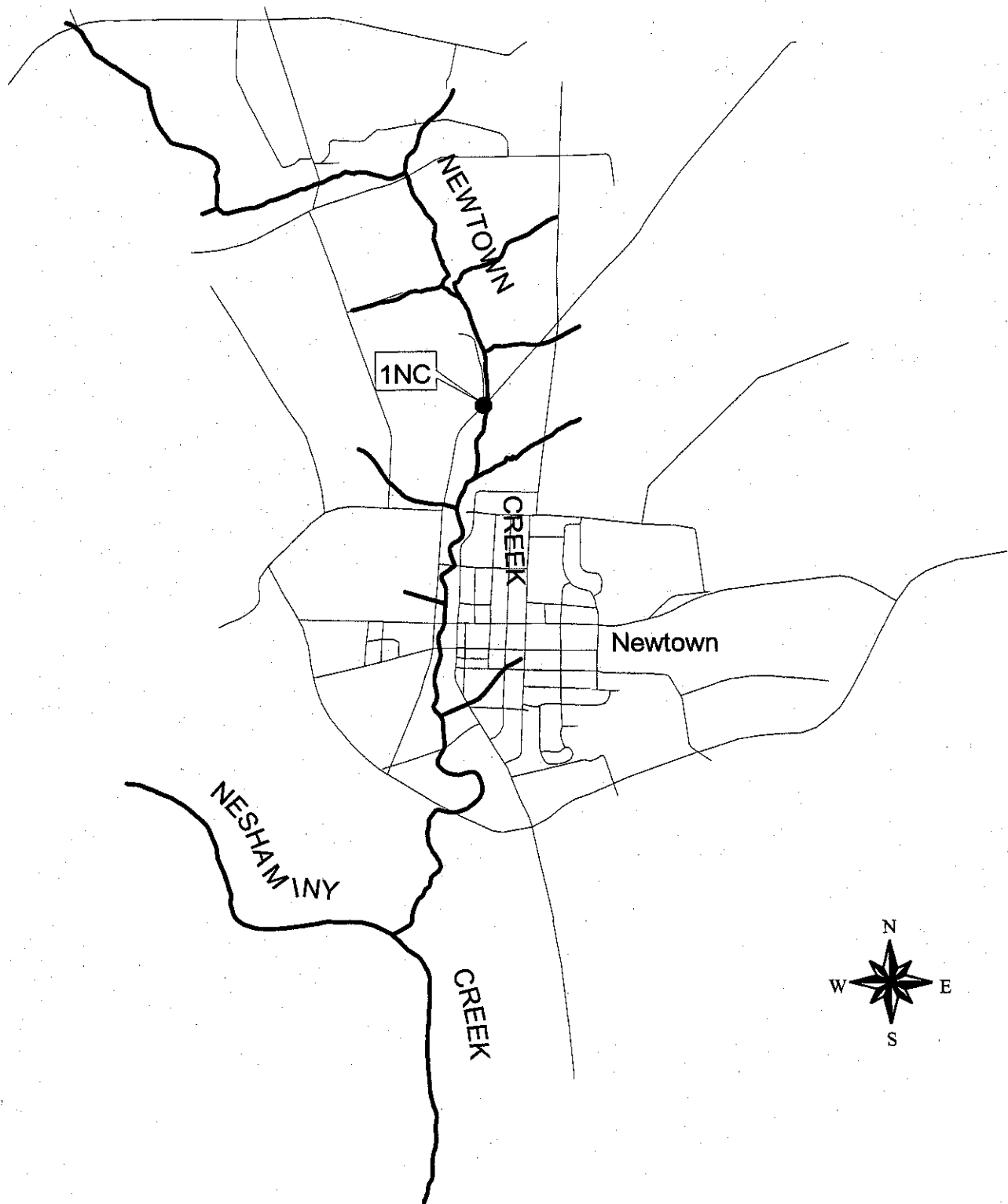


TABLE 1
HABITAT ASSESSMENT SUMMARY
NEWTOWN CREEK, BUCKS COUNTY
JANUARY 24, 2002

HABITAT PARAMETER	scoring range	STATION 1NC
1 . instream cover	0 - 20	14
2 . epifaunal substrate	0 - 20	15
3 . embeddedness	0 - 20	11
4 . velocity/depth	0 - 20	11
5 . channel alterations	0 - 20	16
6 . sediment deposition	0 - 20	13
7 . riffle frequency	0 - 20	13
8 . channel flow status	0 - 20	16
9 . bank condition	0 - 20	16
10 . bank vegetation protection	0 - 20	16
11 . grazing/disruptive pressures	0 - 20	13
12 . riparian vegetation zone width	0 - 20	11
Total Score	0 - 240	165

TABLE 2
D-FRAME RESULTS
NEWTOWN CREEK, BUCKS COUNTY
January 24, 2002

TAXA	Station	1NC ¹	Relative Abundance ^{2,3}
<u>Mayflies</u>			
Caenidae	<i>Caenis</i>	-	R
<u>Stoneflies</u>			
Capniidae	<i>Allocaenia</i>	1	R
<u>Caddisflies</u>			
Hydropsychidae	<i>Cheumatopsyche</i>	9	P
	<i>Hydropsyche</i>	1	R
<u>True Flies</u>			
Chironomidae		69	A
Simuliidae	<i>Simulium</i>	-	R
<u>Misc. Insect Taxa</u>			
Coenagrionidae	<i>Argia</i>	1	R
Elmidae	<i>Stenelmis</i>	2	R
Hydrophilidae	<i>Berosus</i>	2	R
<u>Non-Insect Taxa</u>			
Isopoda	<i>Caecidotea</i>	12	C
Mollusca	<i>Corbiculidae</i>	-	R
	<i>Physidae</i>	-	R
	<i>Sphaeriidae</i>	3	R
total # individuals		100	-
taxa richness		9	13

¹ - Compilation of 100 count subsample

² - Based on scan of the total sample

³ - Occurrence; R - rare (<3), P - present (3-9), C - common (10-24), A - abundant (25-100)

TABLE 3
FISHES¹
NEWTOWN CREEK, BUCKS COUNTY
January 24, 2002

	Station 1NC
<i>Semotilus atromaculatus</i> , creek chub	C
<i>Catostomus commersoni</i> , white sucker	C
<i>Etheostoma olmstedii</i> , tessellated darter	C
<i>Fundulus diaphanus</i> , banded killifish	C
<i>Rhinichthys atratulus</i> , blacknose dace	P
<i>Lepomis macrochirus</i> , bluegill	R
TOTAL TAXA	6

¹ - Occurrence: R - rare (<3), P - present (3-9), C - common (10-24), A - abundant (25-100)