Stream: Cohocton River, Steuben County, New York

Reach: Bowles Corner to Painted Post, New York

Drainage basin: Chemung River

Background:

The Stream Biomonitoring Unit sampled the Cohocton River in Steuben County, New York, on July 8-9, 2004. The purpose of the sampling was to assess overall water quality and compare it to previous results. The study was also part of a larger study correlating nutrient levels with macroinvertebrate communities, which will be reported separately. In a riffle area at eight sites, one traveling kick sample for macroinvertebrates was taken using methods described in the Quality Assurance document (Bode, et al., 2002) and summarized in Appendix I. The contents of each sample were field-inspected, to determine major groups of organisms present, and then preserved in alcohol for laboratory inspection of a 100-specimen subsample from each site. Macroinvertebrate community parameters used in the determination of water quality included species richness, biotic index, EPT richness, and percent model affinity (see Appendices II and III). Expected variability of results is stated in Smith and Bode (2004). Table 2 provides a listing of sampling sites and Table 3 provides a listing of all macroinvertebrate species collected in the present survey. This is followed by macroinvertebrate data reports, including raw macroinvertebrate data from each site.

Results and Conclusions:

1. Water quality in the Cohocton River ranged from slightly impacted to non-impacted, gradually improving downstream. Nutrient enrichment was the primary stressor causing the impact.

2. Compared to results of previous samplings, no temporal trends are indicated. Water quality fluctuates between non-impacted and slightly impacted, appearing better during high-flow years.

Discussion:

The Cohocton River originates near Tabor Corners in Livingston County. It flows in a generally southeasterly direction for 55 miles before joining the Tioga River at Painted Post to form the Chemung River. The Cohocton River has been sampled by the Stream Biomonitoring Unit at various sites and at irregular intervals since 1973 (Bode, et al., 2004). Since 1992, all samplings have shown water quality to range between non-impacted and slightly impacted, with water quality usually appearing better during high-flow years, a situation that usually indicates dilution of point sources.

In the present study, water quality ranged from non-impacted to slightly impacted, with water quality gradually improving downstream (Figure 1). Macroinvertebrate communities at most sites were dominated by clean-water mayflies. Midges, algal-scraping riffle beetles, and filter-feeding caddisflies were also numerous at most sites, reflecting abundant algae and elevated nutrient levels.

A new macroinvertebrate measure of nutrient enrichment, the Nutrient Biotic Index (NBI), was recently developed by Smith (see Appendix XI). Indices were developed to reflect the effects of total phosphorous (NBI-P) and nitrate (NBI-N). For the Cohocton River, the NBI-P shows greatest enrichment effects in the reach from Cohocton to Bath - Stations 2 to7A (Figure 2); the NBI-P values at these three sites exceed 6.0, the provisional threshold for eutrophic waters. The index trend is also similar to that for nutrient levels - nitrates and phosphorus - which are shown combined in Figure 2. Impact Source Determination also shows the trend that the upstream sites exhibit more effects of nutrient enrichment (Table 1). Based on the NBI and annual flow-related trends, it appears that upstream enrichment in the Cohocton River is diminished by downstream dilution.

Literature Cited:

Bode, R.W., M.A. Novak, L.E. Abele, D.L. Heitzman, and A.J. Smith. 2002. Quality assurance work plan for biological stream monitoring in New York State. New York State Department of Environmental Conservation, Technical Report, 115 pages.

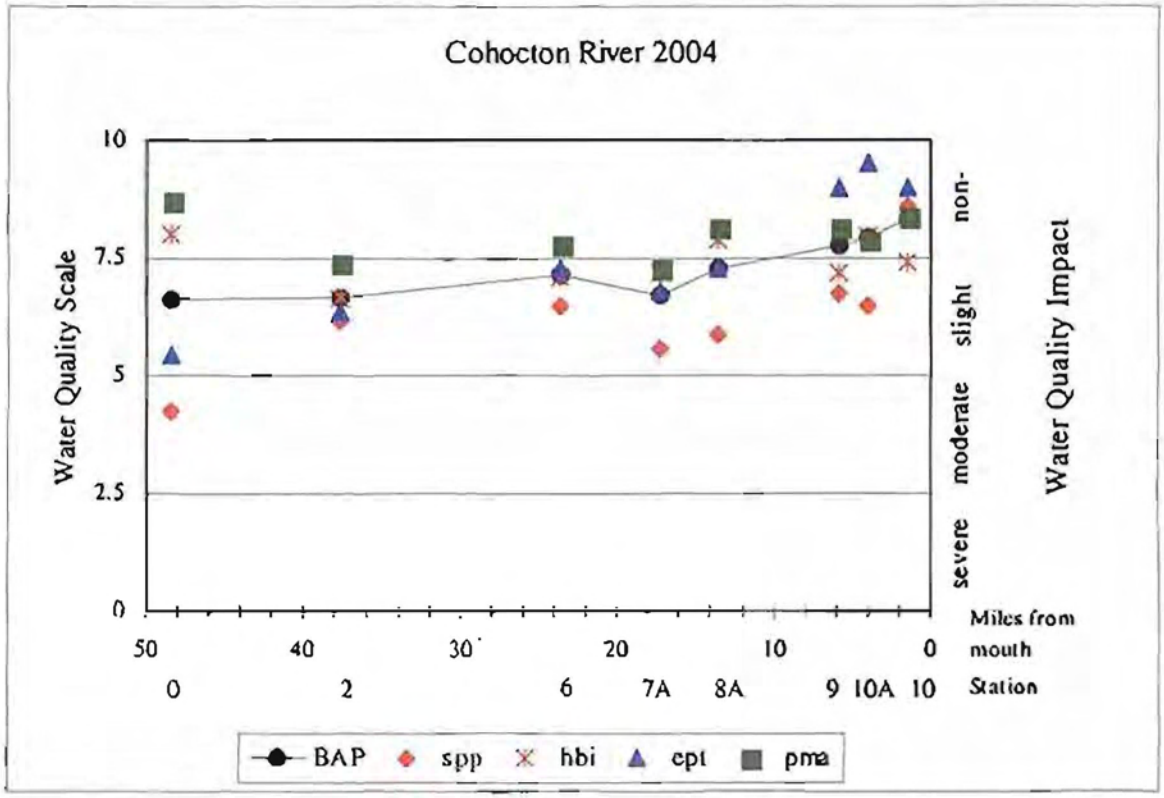
Bode, R.W., M.A. Novak, L.E. Abele, D.L. Heitzman, and A.J. Smith. 2004. Thirty year trends in water quality of rivers and streams in New York State. New York State Department of Environmental Conservation, Technical Report, 384 pages.

Smith, A.J., and R.W. Bode. 2004. Analysis of variability in New York State benthic macroinvertebrate samples. New York State Department of Environmental Conservation, Technical Report, 43 pages.

Overview of Field Data:

Based on the July sampling, the Cohocton River at the sites sampled was 4-50 meters wide, 0.2-0.3 meters deep, and had current speeds of 83-143 cm/sec in riffles. Dissolved oxygen was 9.0-12.0 mg/l, specific conductance was 241-716 µmhos, pH was 7.7-8.4 and the temperature was 17.3-21.5 °C (63-71 °F). Measurements for each site (July sampling) are found on the field data summary sheets.

Figures 1and 2. Figure 1 (top) is the Biological Assessment Profile of index values, Cohocton River, 2004. Values are plotted on a normalized scale of water quality. The line connects the mean of the four values for each site, representing species richness, EPT richness, Hilsenhoff Biotic Index, and Percent Model Affinity. See Appendix IV for more complete explanation. Figure 2 (bottom) includes NBI values and nutrient levels.



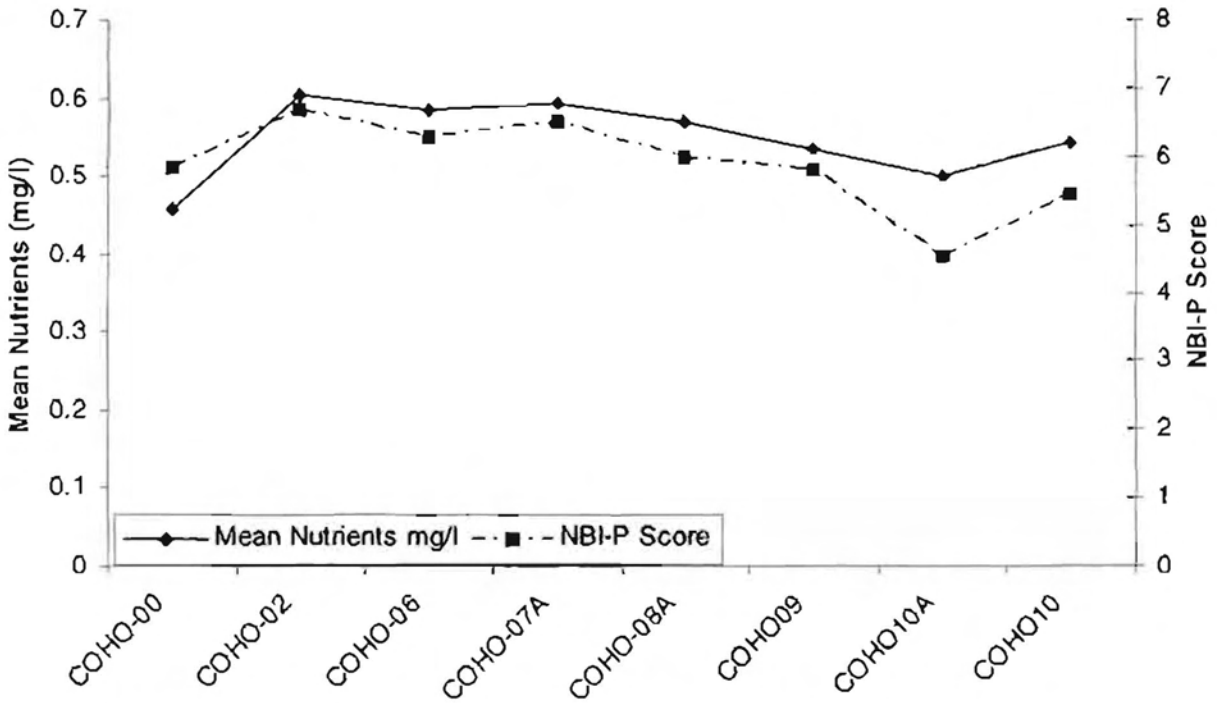


Table 1. Impact Source Determination, Cohocton River, 2004. Numbers represent similarity to community type models for each impact category. The highest average similarities at each station are shaded. Similarities less than 50% are less conclusive. Highest numbers represent probable type of impact. See Appendix X for further explanation.

	Station							
Community Type	00	02	06	07A	08A	09	10A	10
Natural: minimal human impacts	56	52	57	46	57	56	61	53
Nutrient enrichment: usually nonpoint	56	63	57	57	58	60	45	43
Toxic: industrial, municipal, or urban run-off	42	66	53	35	37	52	40	48
Organic: sewage, animal wastes	27	45	54	47	41	56	37	47
Complex: municipal and/or industrial	34	55	46	37	30	47	39	30
Siltation	42	55	50	54	51	60	52	59
Impoundment	34	57	57 *	47	43	50	39	57 *

Table Summary (*Impoundment indications are considered spurious)

STATION	COMMUNITY TYPE
COHO-00	Natural, Nutrients
COHO-02	Toxic, Nutrients
COHO-06	Natural, Nutrients, Toxic, Organic
COHO-07A	Nutrients, Siltation
COHO-08A	Natural, Nutrients
COHO-09	Natural, Nutrients, Organic, Siltation
COHO-10A	Natural
COHO-10	Siltation

Table 2. Station Locations for the Cohocton River, Steuben County, New York

STATION	LOCATION
00	Bowles Corners, NY Rte 21, immediately downstream of bridge 48.4 river miles from mouth latitude/longitude: 42°34'03"; 77°32'09"
02	Cohocton, NY Route 415, below bridge 37.7 river miles from mouth latitude/longitude: 42°30'03"; 77°30'02"
06	Kanona, NY Rte 415 bridge, 150 meters below bridge 23.6 river miles above mouth latitude/longitude: 42°22'10"; 77°21'54"
07A	Bath, NY Rte 11 bridge, 10 meters below bridge 17.3 river miles above mouth latitude/longitude: 42°18'45"; 77°16'51"

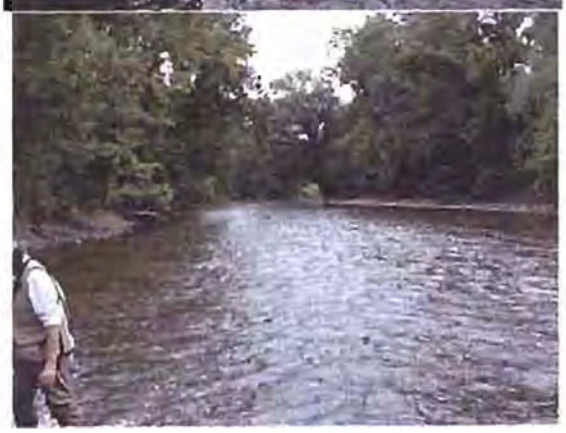


Table 2. Station Locations, cont'd.

08A Savona, NY
County Route 12 bridge,
50 meters above bridge
13.5 river miles above mouth
latitude/longitude:42°17'20";77°13'34"

09 Curtis, NY
Route 4 bridge, 10 meters above bridge
5.9 river miles above mouth
latitude/longitude: 42°12'24"; 77°09'51"

10A Coopers Plains, NY
Smith Road bridge, 200 meters above bridge
4.0 river miles above mouth
latitude/longitude: 42°11'02"; 77°09'07"

10 Painted Post, NY
Canada Road extension, at Fishing Access
1.4 river miles above mouth
latitude/longitude: 42°10'05"; 77°06'19"

Figure 3	Site Overview Map	Cohocton River

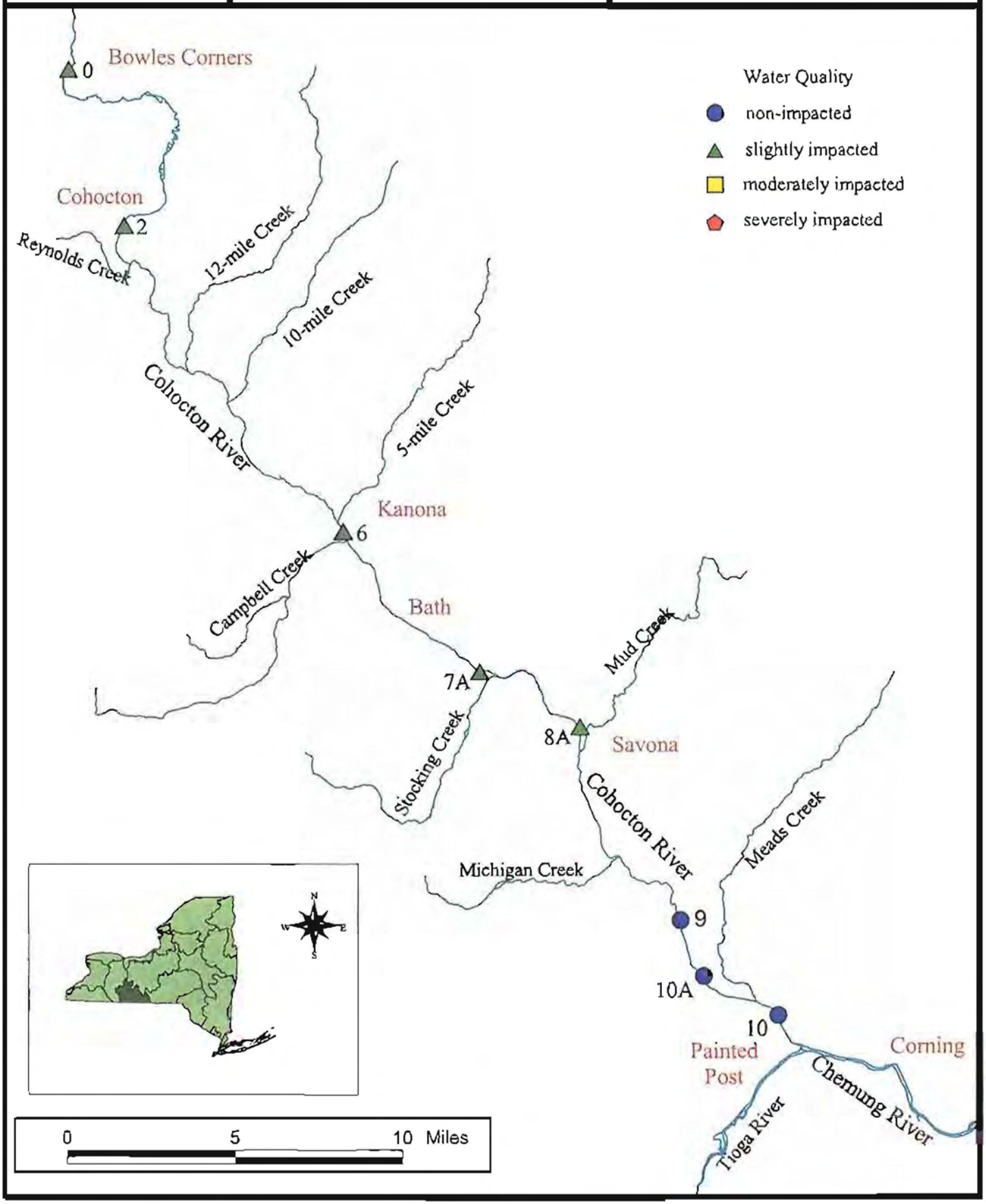


Figure 4a	Site Location Map	Cohocton River

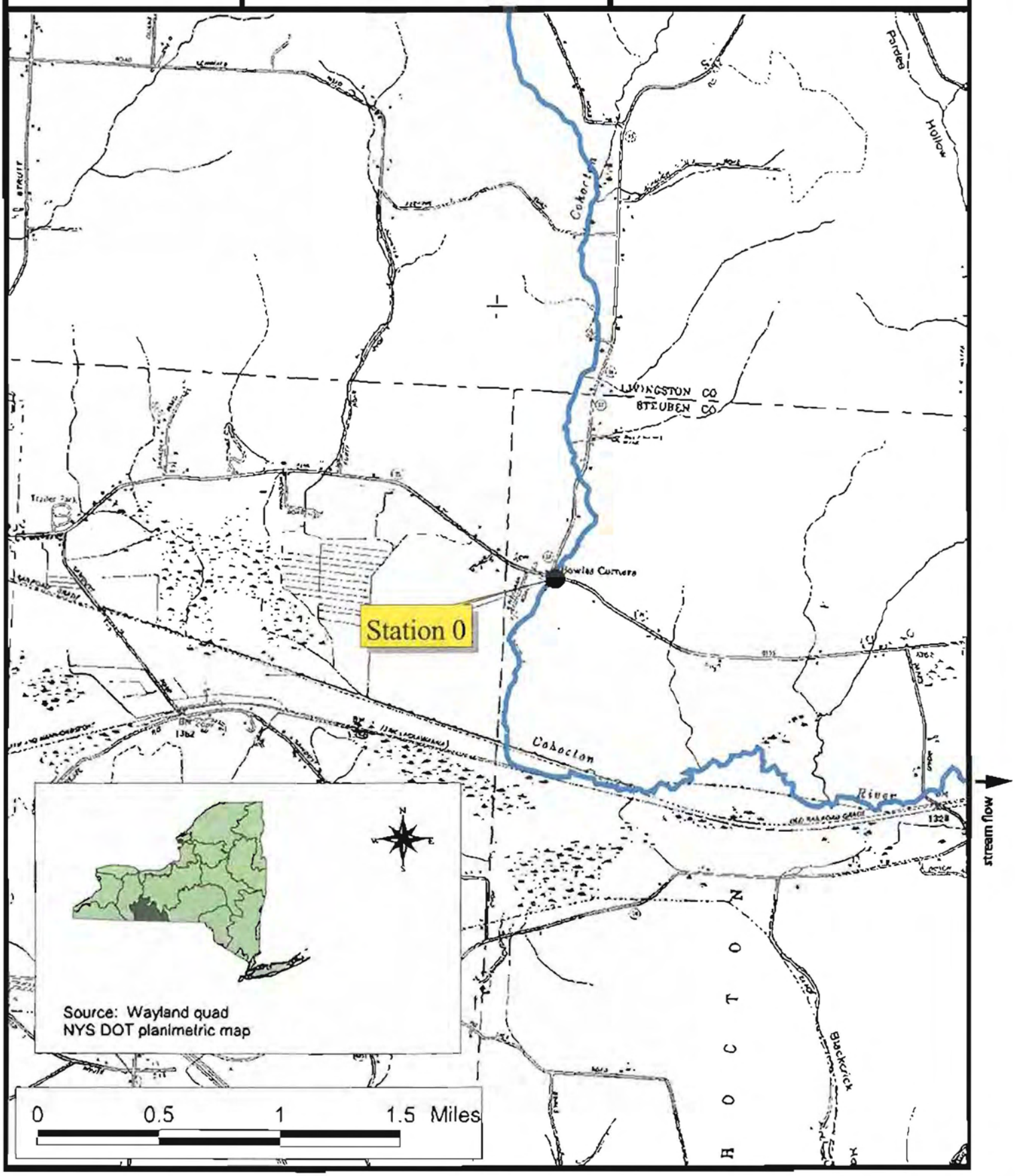
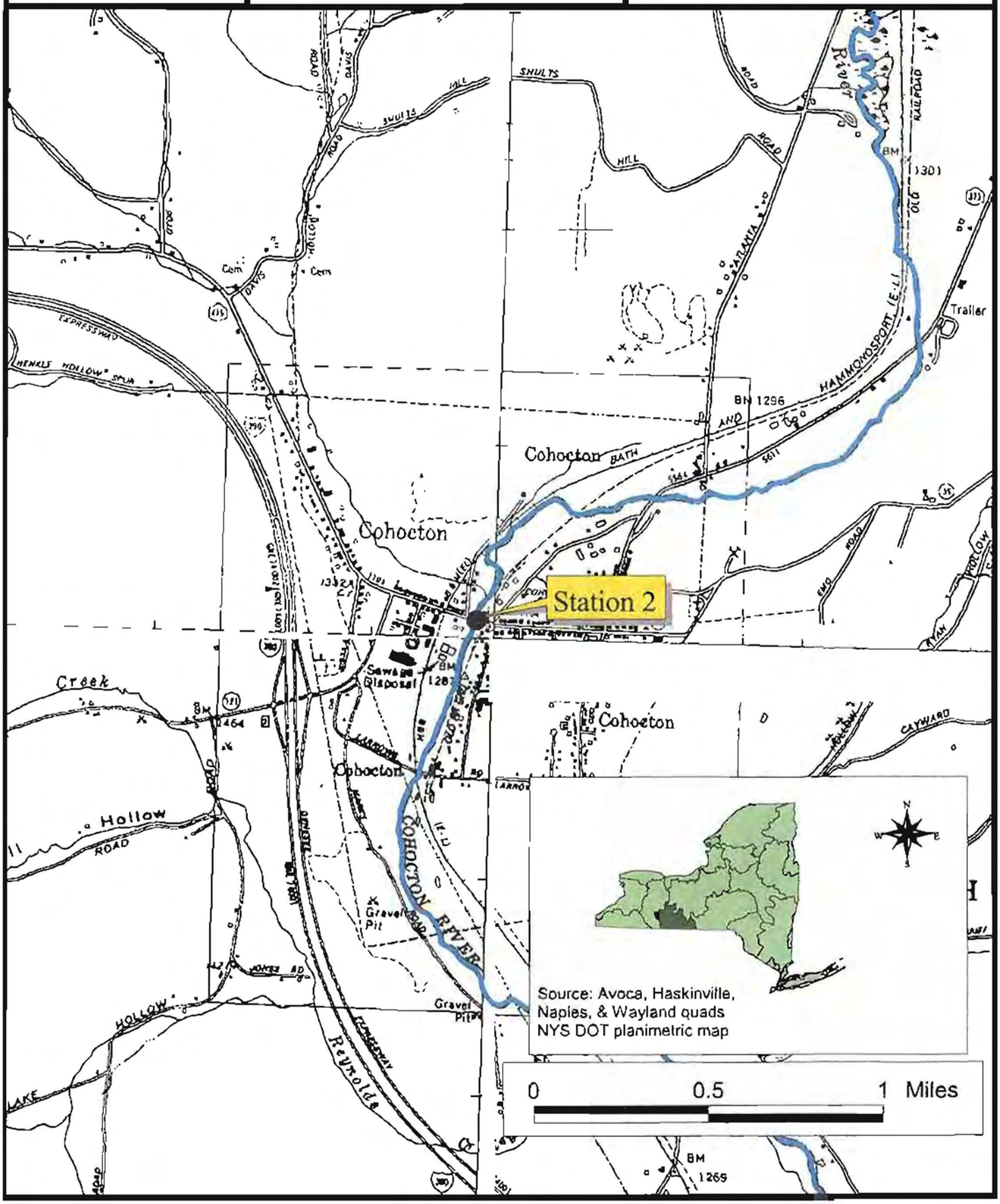


Figure 4b	Site Location Map	Cohocton River



stream flow

Figure 4c	Site Location Map	Cohocton River

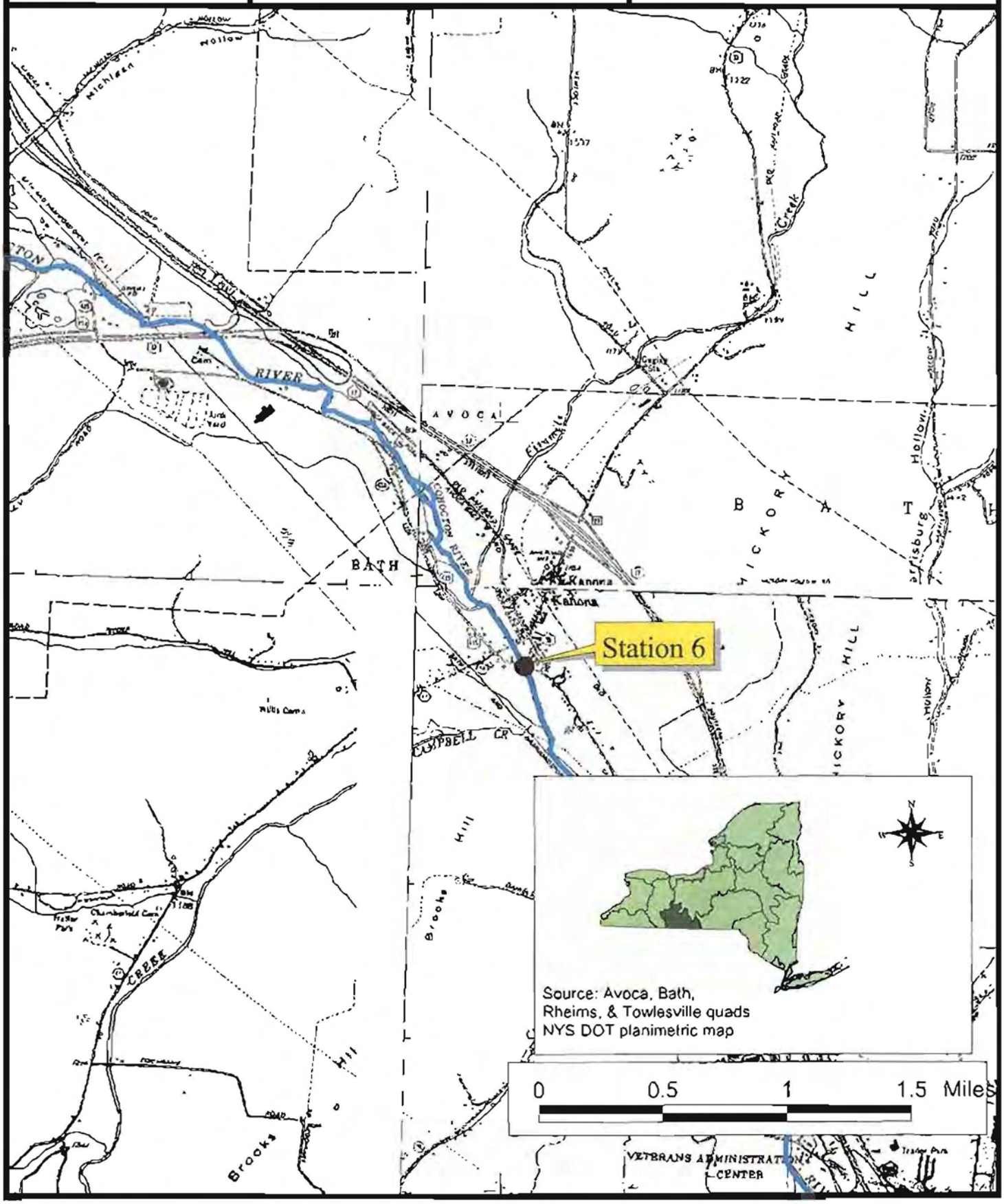


Figure 4d	Site Location Map	Cohocton River

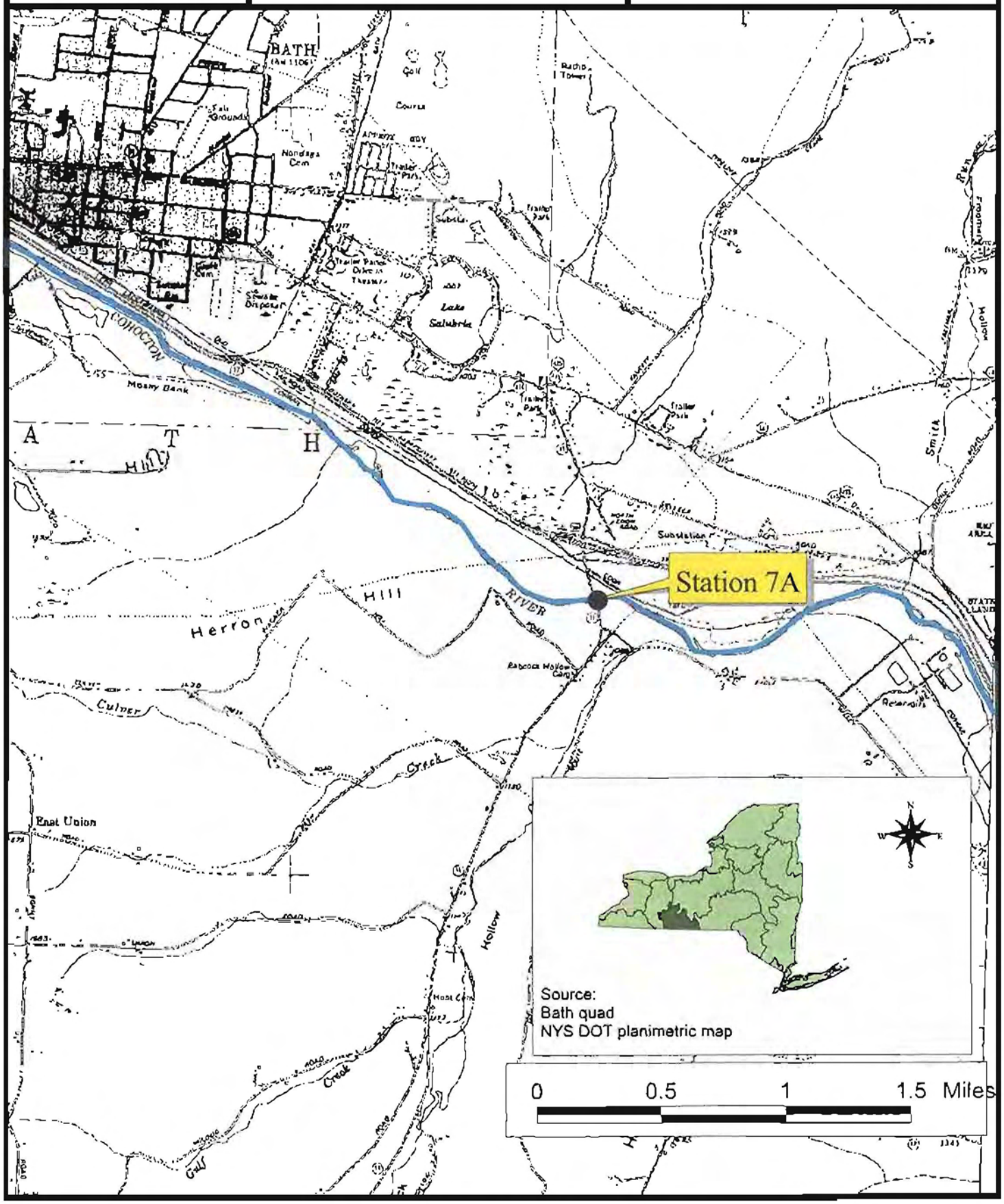
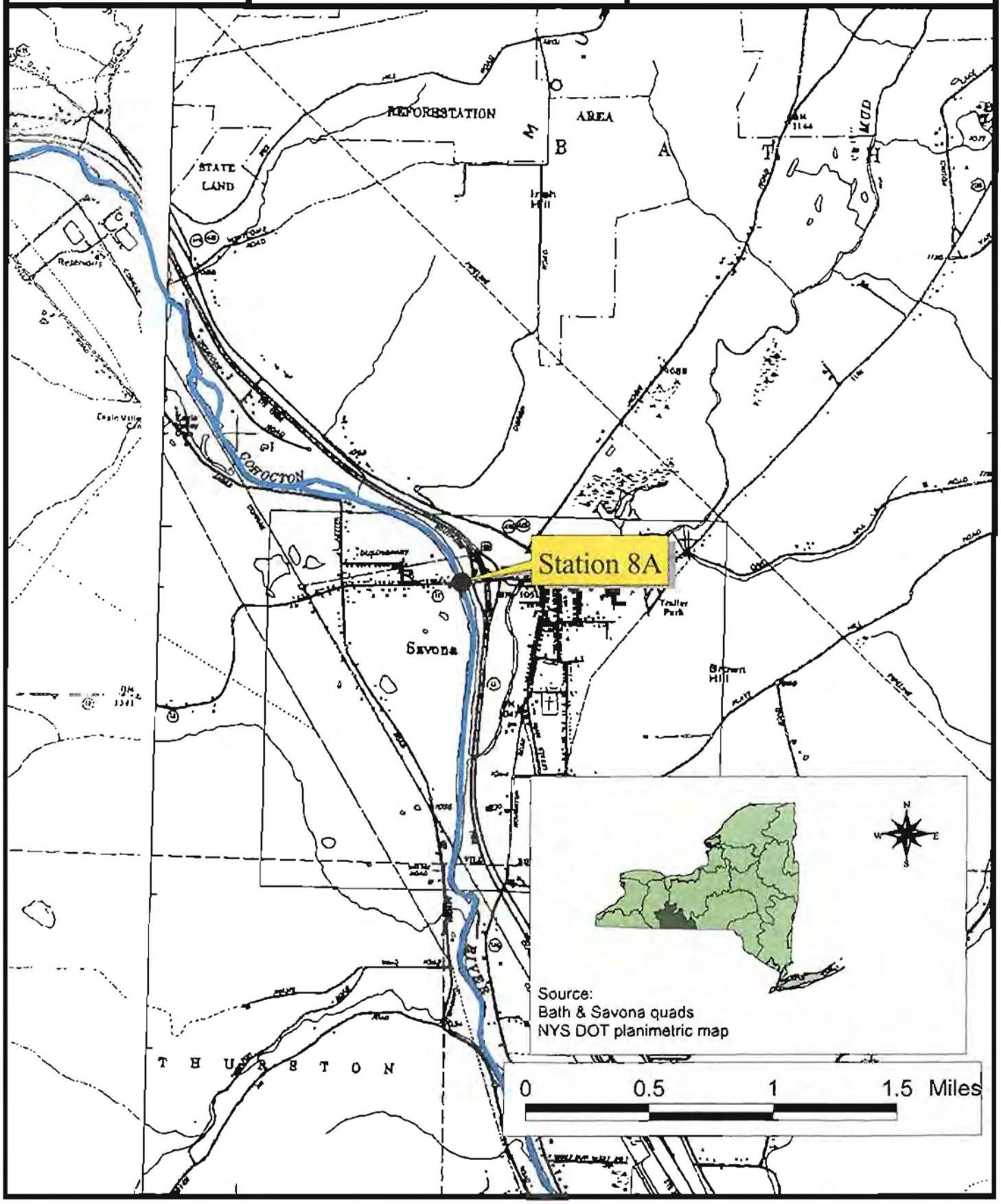


Figure 4e	Site Location Map	Cohocton River



 stream flow

Figure 4f	Site Location Map	Cohocton River

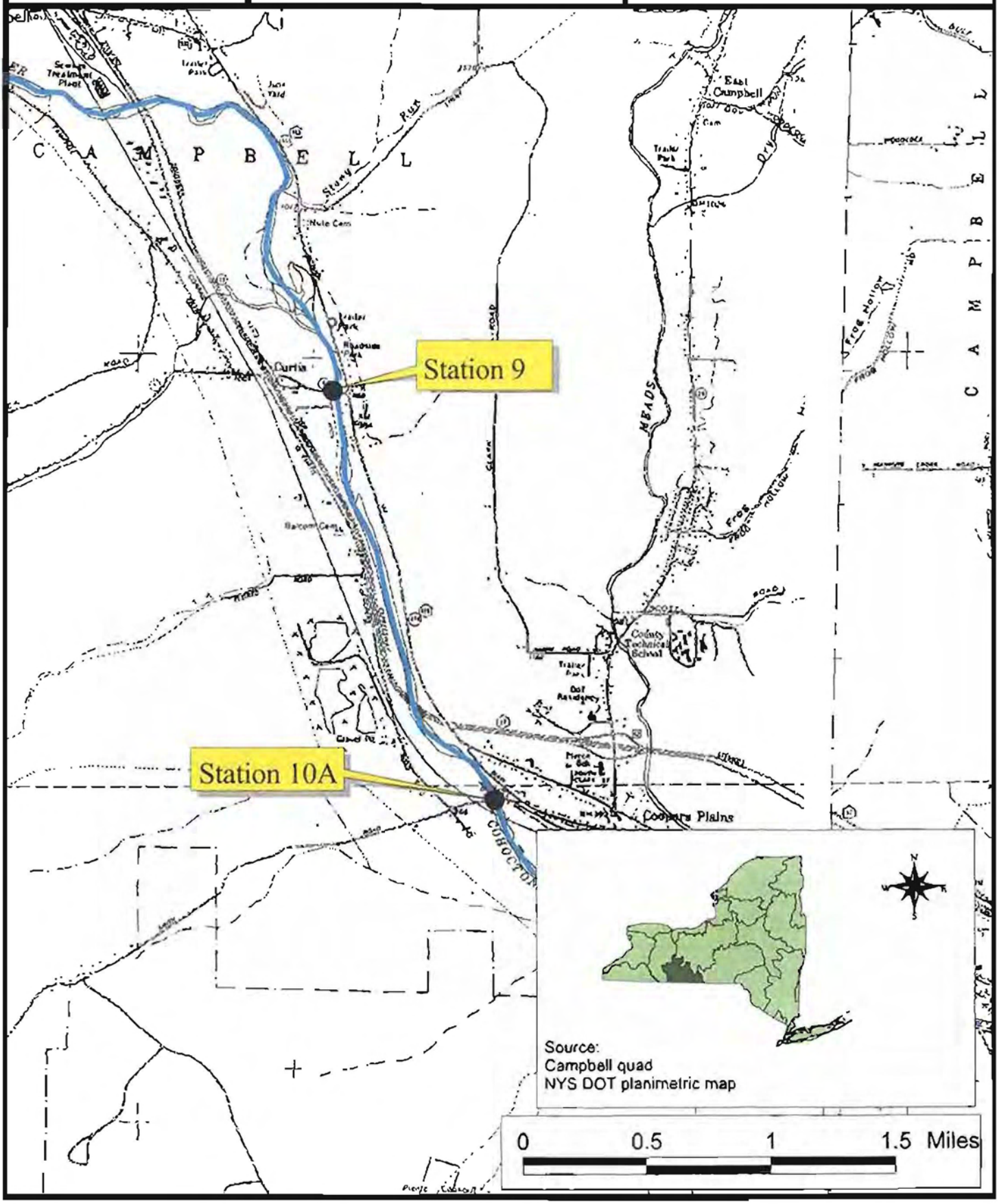


Figure 4g	Site Location Map	Cohocton River

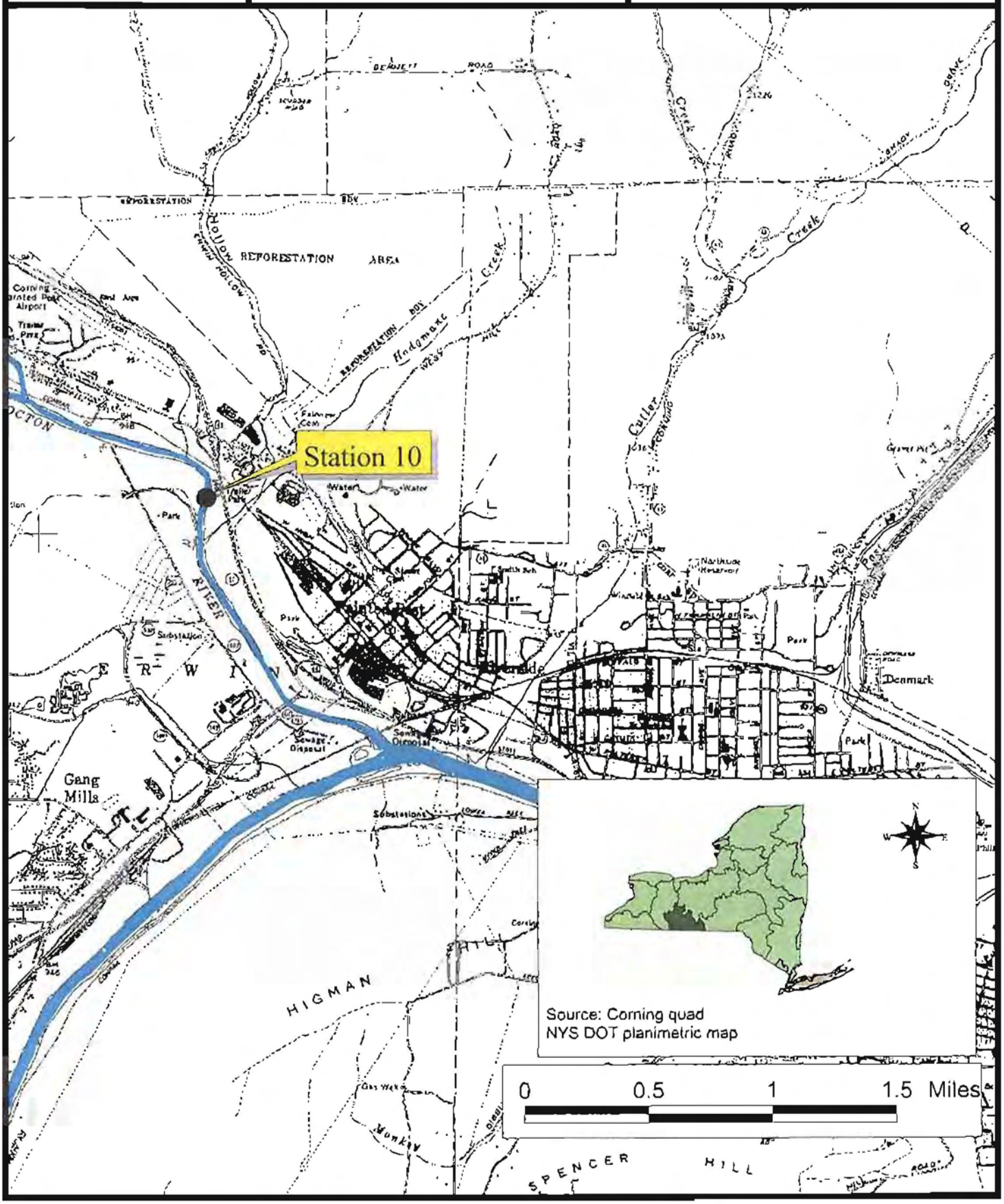


Table 3. Macroinvertebrate Species Collected in the Cohocton River, Steuben County, New York, 2004

ANNELIDA
- OLIGOCHAETA
  - LUMBRICIDA
    - Undetermined Lumbricina
  - LUMBRICULIDA
    - Lumbriculidae
      - Undetermined Lumbriculidae
- HIRUDINEA
  - Glossiphoniidae
    - Undetermined Hirudinea

MOLLUSCA
- PELECYPODA
  - Sphaeriidae
    - *Sphaerium sp.*
    - Undetermined Sphaeriidae

CRUSTACEA
- AMPHIPODA
  - Gammaridae
    - *Gammarus* sp.

ARTHROPODA
- INSECTA
  - EPHEMEROPTERA
    - Isonychiidae
      - *Isonychia bicolor*
    - Baetidae
      - *Acentrella sp.*
      - *Baetis flavistriga*
      - *Baetis intercalaris*
    - Heptageniidae
      - *Leucrocuta sp.*
      - *Nixe (Nixe) sp.*
      - *Rhithrogena sp.*
      - *Stenonema sp.*
    - Ephemerellidae
      - *Ephemerella sp.*
      - *Serratella deficiens*
      - *Serratella serratoides*
    - Leptohyphidae
      - *Tricorythodes sp.*
    - Caenidae
      - *Caenis sp.*
  - PLECOPTERA
    - Leuctridae
      - *Leuctra sp.*
    - Perlidae
      - *Agnetina capitata*
      - *Paragnetina media*
  - COLEOPTERA
    - Psephenidae
      - *Ectopria nervosa*
      - *Psephenus herricki*
    - Elmidae
      - *Optioservus fastiditus*
      - *Optioservus trivittatus*
      - *Stenelmis cheryl*
      - *Stenelmis crenata*
  - TRICHOPTERA
    - Philopotamidae
      - *Chimarra aterrima?*
      - *Chimarra obscura*
      - *Dolophilodes sp.*
    - Psychomyiidae
      - *Psychomyia flavida*
    - Hydropsychidae
      - *Cheumatopsyche sp.*
      - *Hydropsyche bronta*
      - *Hydropsyche leonardi*
      - *Hydropsyche morosa*
      - *Hydropsyche scalaris*
      - *Hydropsyche slossonae*
      - *Hydropsyche sparna*
    - Hydroptilidae
      - *Hydroptila sp.*
    - Uenoidae
      - *Neophylax sp.*
    - Limnephilidae
      - *Pycnopsyche sp.*
  - DIPTERA
    - Tipulidae
      - *Antocha sp.*
      - *Dicranota sp.*
    - Simuliidae
      - *Simulium tuberosum*
      - *Simulium vittatum*
      - *Simulium sp.*
    - Chironomidae
      - *Thienemannimyia group spp.*
      - *Pagastia orthogonia*
      - *Cardiocladius albiplumus*
      - *Cardiocladius obscurus*
      - *Cricotopus tremulus gr.*
      - *Cricotopus trifascia gr.*
      - *Cricotopus vierriensis*
      - *Eukiefferiella devonica gr.*
      - *Orthocladius nr. dentifer*
      - *Orthocladius dubitatus*
      - *Orthocladius sp.*
      - *Parakiefferiella sp.*
      - *Tvetenia bavarica gr.*
      - *Tvetenia vitracies*
      - *Cryptochironomus fulvus.*
      - *Microtendipes pedellus gr.*
      - *Polypedilum aviceps*
      - *Polypedilum flavum*
      - *Rheotanytarsus exiguus gr.*
      - *Sublettea coffmani*
      - *Tanytarsus sp.*