

BIOASSESSMENT OF INTERSTATE STREAMS

Abbreviations for water quality standards are provided in Table 19. Summaries of all stations include WQI scores, parameters that exceeded water quality standards, and parameters that exceeded the 90th percentile at each station. RBP III biological and habitat data also are provided, along with graphs depicting historical water quality and biological conditions over the past five years. A white bar indicates fiscal year 2005 WQI scores, and black bars in all WQI graphs indicate previous WQI scores.

New York-Pennsylvania Border Streams

Apalachin Creek (APAL 6.9)

Apalachin Creek at Little Meadows, PA, (APAL 6.9), showed a nonimpaired biological community during fiscal year 2005 for the second consecutive year. Habitat was rated as supporting, with low scores for frequency of riffles and riparian vegetative zone width. Staff noted that substrate had been disturbed due to a recent high water event.

There were no parameters that exceeded water quality standards during August 2004. This is the first time during the past five years that total iron has not exceeded water quality standards in Apalachin Creek. The WQI again decreased slightly from the previous year, reaching its lowest value in six years (Table 20).

Bentley Creek (BNTY 0.9)

A nonimpaired biological community existed at Bentley Creek in Wellsburg, NY, (BNTY 0.9) in August 2004, after a rating of slightly impaired the previous year. This site received a high rating for taxonomic richness, Shannon Diversity Index and EPT Index. Habitat was rated supporting, with low scores given for channel alteration, condition of banks, and vegetative protective cover. The Bradford County Conservation District in Pennsylvania and the U.S. Fish and Wildlife Service conducted a stream stabilization project on this stream. Rock structures, such as cross vanes and single rock vanes, have been constructed in portions of the stream to redirect the force of the flow.

During fiscal year 2000, water quality sampling at BNTY 0.9 was increased to quarterly sampling, and the stream was added to the Group 1 stations. Total iron and total aluminum concentrations exceeded New York standards during February 2005, and dissolved oxygen and temperature each exceeded the 90th percentile one time during the year (Table 21).

Table 19. Abbreviations Used in Tables 20 Through 51

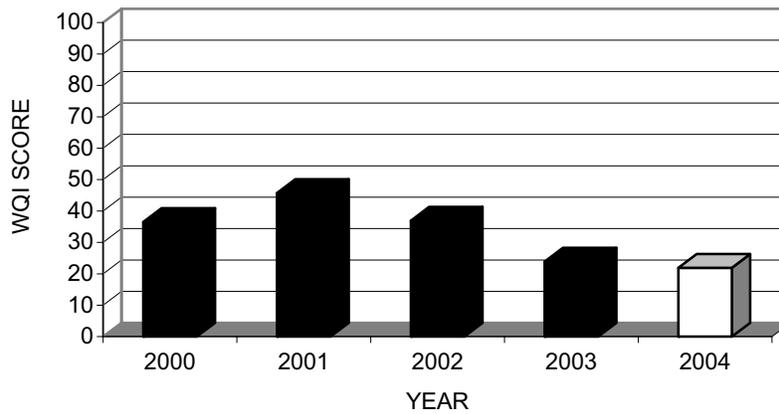
Abbreviation	Parameter	Abbreviation	Parameter
ALK	Alkalinity	TNO3	Total Nitrate
COND	Conductivity	TN	Total Nitrogen
TAI	Total Aluminum	DO	Dissolved Oxygen
TCa	Total Calcium	TP	Total Phosphorus
TCI	Total Chloride	TPO4	Total Orthophosphate
TFe	Total Iron	TS	Total Solids
TMg	Total Magnesium	TSO4	Total Sulfate
TMn	Total Manganese	TOC	Total Organic Carbon
TNH3	Total Ammonia	TURB	Turbidity
TNO2	Total Nitrite	WQI	Water Quality Index
TCIn	Total Chlorine	RBP	Rapid Bioassessment Protocol
SS	Suspended Sediment		

Table 20. Water Quality Summary Apalachin Creek at Little Meadows, Pa.

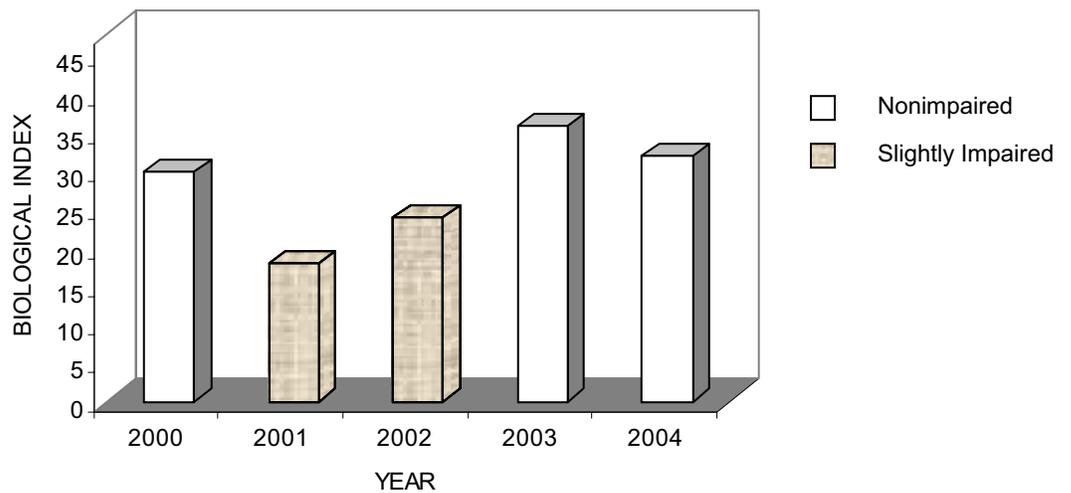
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile						
08/25/04	21.9	None						

Biological and Habitat Summary	
Number of Taxa	25
Diversity Index	2.49
RBP Score	32
RBP Condition	Nonimpaired
Total Habitat Score	139
Habitat Condition Category	Supporting



Water Quality Index



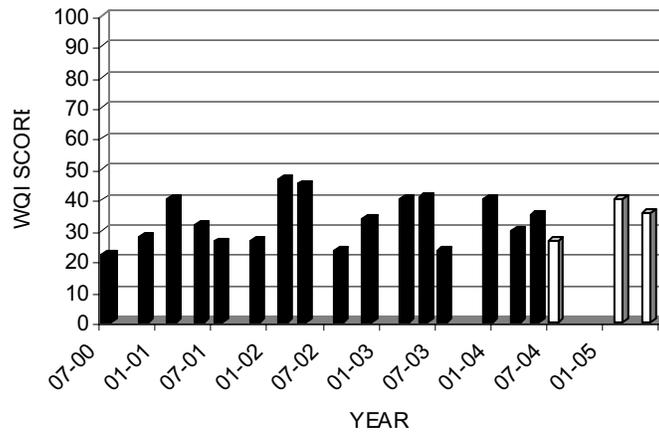
Biological Index

Table 21. Water Quality Summary Bentley Creek at Wellsburg, N.Y.

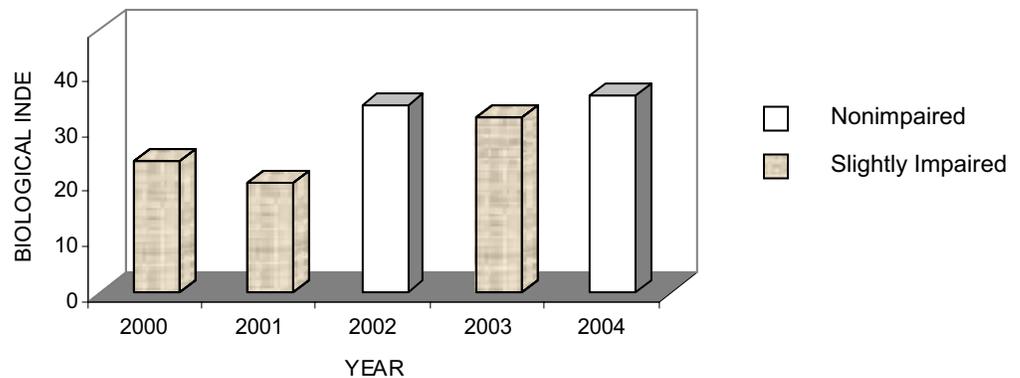
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TAI	02/15/05	298 ug/l	100 ug/l	NY aquatic (chronic)
TFe	02/15/05	337 ug/l	300 ug/l	NY aquatic (chronic)

Date	WQI	Parameters Exceeding 90 th Percentile						
07/20/04	26.6	None						
02/15/05	40.0	DO						
05/10/05	36.0	Temp						

Biological and Habitat Summary	
Number of Taxa	27
Diversity Index	2.65
RBP III Score	36
RBP III Condition	Nonimpaired
Total Habitat Score	136
Habitat Condition Category	Supporting



Water Quality Index



Biological Index

Cascade Creek (CASC 1.6)

Cascade Creek at Lanesboro, PA, (CASC 1.6) served as the reference site for the NY-PA streams in fiscal year 2005 because it had the best combination of biological, habitat, and water quality conditions. It had a nonimpaired biological community with high taxonomic richness and Shannon Diversity Index, as well as low values for percent Chironomidae and percent dominant taxa. Habitat conditions were rated as excellent, with high scores for embeddedness, instream cover, frequency of riffles, and riparian vegetative zone width.

Cascade Creek was added to the Group 1 streams during the 2000 sampling season to monitor conditions in the stream during the winter months. Cascade Creek did exceed the water quality standard for total iron in July 2004 and for alkalinity in October, February, and May (Table 22). High values for total iron and low alkalinity values are not uncommon in headwater glacial streams such as Cascade Creek and do occur naturally resulting from the local hydrogeology.

Cayuta Creek (CAYT 1.7)

Biological conditions of Cayuta Creek at Waverly, NY (CAYT 1.7) were rated nonimpaired, as they were during fiscal year 2004. This site had the lowest percent Chironomidae of all streams along the Pennsylvania-New York border. Habitat conditions were rated as supporting, with low scores for riparian vegetative zone width, channel alteration, and conditions of banks as Cayuta Creek is located in an urbanized area of Waverly, NY. Abundant algal growth was noted on the stream substrate as it has been in previous years.

CAYT 1.7 exceeded the New York aquatic (chronic) standard for total aluminum in February 2005; however, all other Cayuta Creek total aluminum samples for 2004-2005 remained below the detection limit of 200 micrograms per liter ($\mu\text{g/l}$). New York state standards for total iron were exceeded at CAYT 1.7 in February 2005. Several parameters exceeded the 90th percentile including dissolved oxygen, total phosphorus, total orthophosphate, total nitrate, and total solids (Table 23). The total chlorine values were 0.06 milligrams per liter (mg/l) in August, 0.04 mg/l in October, 0.1 mg/l in February and 0.04 mg/l in May. These values all exceed the New York aquatic life standard for total residual chlorine. This site is downstream of wastewater discharges from the Waverly sewage treatment facility. Additional concerns in the watershed include runoff from the City of Waverly, malfunctioning septic systems, and agriculture.

Choconut Creek (CHOC 9.1)

The biological index score for Choconut Creek at Vestal Center, NY, (CHOC 9.1) remained nonimpaired for the third consecutive year. The habitat was rated excellent; however it was given low ratings for riparian vegetative zone width and conditions of banks.

Total aluminum and total iron exceeded water quality standards in July 2004 with values of 226 $\mu\text{g/l}$ and 442 $\mu\text{g/l}$, respectively. However, no parameters exceeded the 90th percentile (Table 24). The WQI increased slightly in 2005, indicating a decrease in overall water quality.

Holden Creek (HLDN 3.5)

The biological community at Holden Creek at Woodhull, NY (HLDN 3.5) was designated nonimpaired for the third consecutive year. During the July 2004 sampling event, Shannon Diversity Index and EPT index were both among the highest of all the NY-PA border streams. HLDN 3.5 was not sampled from in 2000 and 2001 due to low flow conditions.

No parameters exceeded water quality standards or the 90th percentile at HLDN 3.5 during July 2004. The WQI score was consistent with the WQI score that was calculated the past two years. The habitat was rated excellent, with high scores for epifaunal substrate, instream cover, and frequency of riffles. A salvage yard was located upstream of the sampling site.

Little Snake Creek (LSNK 7.6)

Little Snake Creek at Brackney, PA, (LSNK 7.6) was designated nonimpaired in July 2004 after being slightly impaired the previous summer. LSNK 7.6 had one of the lowest scores for percent Chironomidae of any of the NY-PA border streams. Little Snake Creek was not sampled during 2001 due to low flow conditions.

Water quality values exceeded water quality standards for total iron in three out of the four sampling periods (Table 26). Aluminum and alkalinity also exceeded water quality standards. Dissolved oxygen was above the 90th percentile in February 2005. Habitat was mostly forested with logging activities occurring upstream of the site. The habitat at LSNK 7.6 was rated excellent during 2004 with high scores for sediment deposition, instream cover, and frequency of riffles.

North Fork Cowanesque River (NFCR 7.6)

North Fork Cowanesque River at North Fork, PA, (NFCR 7.6) had a slightly impaired biological community for the second consecutive year. This rating was due mainly to a very low EPT Index and low taxonomic richness. The Hilsenhoff Index was low, probably due to the large number of organic-pollution intolerant stonefly, *Leuctra* (Plecoptera: Leuctridae), as was the case in 2003.

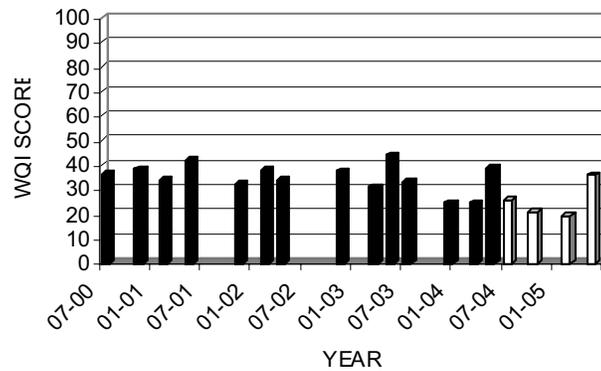
Total iron and total aluminum both exceeded the New York water quality standards, and total nitrogen and total nitrate exceeded the 90th percentile (Table 27). Habitat was rated excellent with the highest overall habitat score of all the NY-PA border streams. High scores were given for epifaunal substrate, instream cover, riparian vegetative zone width, and frequency of riffles. Land use at NFCR 7.6 was predominantly forest. This sampling site is often dry during July and August when Group 1 and 2 sampling is performed; therefore, macroinvertebrate samples have not been collected every year.

Table 22. Water Quality Summary Cascade Creek at Lanesboro, Pa.

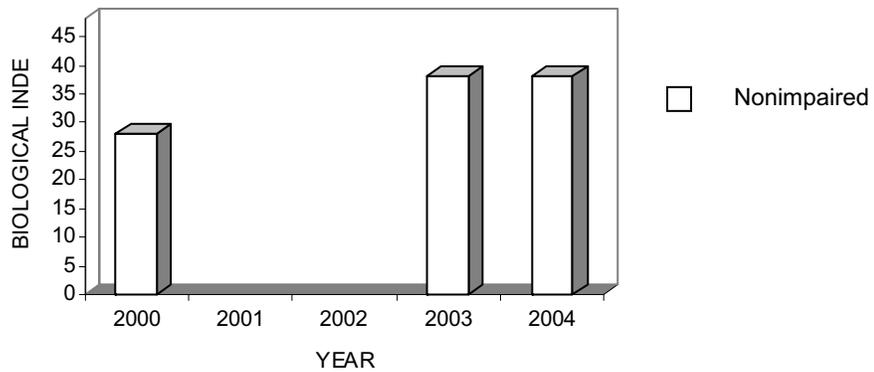
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TFe	07/19/04	868 ug/l	300 ug/l	NY aquatic (chronic)
ALK	10/20/04	12 mg/l	20 mg/l	PA aquatic life
ALK	02/14//05	16 mg/l	20 mg/l	PA aquatic life
ALK	05/9/05	10 mg/l	20 mg/l	PA aquatic life

Date	WQI	Parameters Exceeding 90 th Percentile							
7/19/04	25.8	DO							
10/20/04	21.0	None							
2/14/05	19.4	DO							
5/9/05	35.9	TFe							

Biological and Habitat Summary	
Number of Taxa	25
Diversity Index	2.72
RBP III Score	38
RBP III Condition	Reference
Total Habitat Score	171
Habitat Condition Category	Reference



Water Quality Index



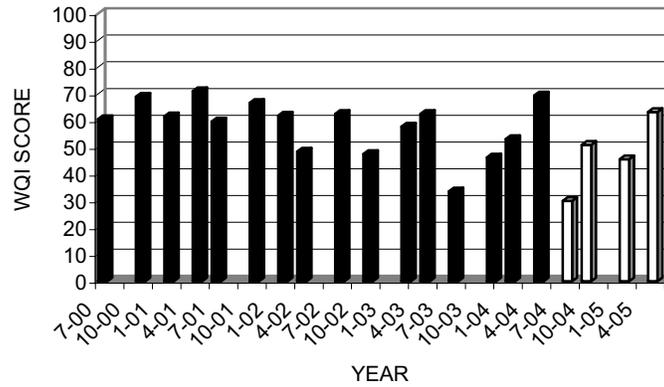
Biological Index

Table 23. Water Quality Summary Cayuta Creek at Waverly, N.Y.

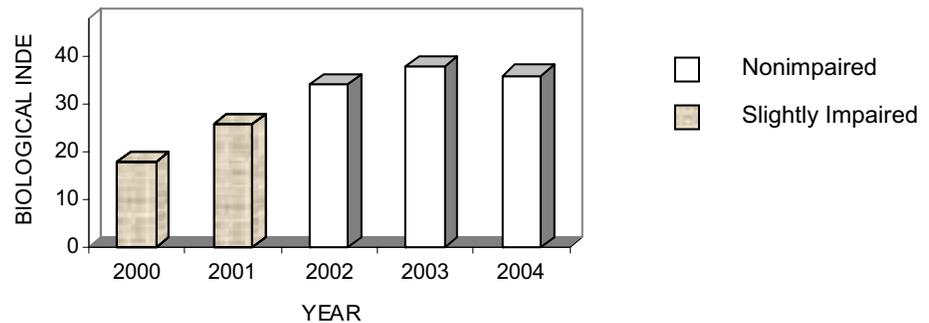
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TCl _n	08/26/04	0.06 mg/l	0.019 mg/l	NY aquatic (acute)
TCl _n	10/21/04	0.04 mg/l	0.019 mg/l	NY aquatic (acute)
TFe	02/15/05	372 ug/l	300 ug/l	NY aquatic (chronic)
TCl _n	02/15/05	0.1 mg/l	0.019 mg/l	NY aquatic (acute)
TAl	02/15/05	260 ug/l	100 ug/l	NY aquatic (chronic)
TCl _n	05/09/05	0.04 mg/l	0.019 mg/l	NY aquatic (acute)

Date	WQI	Parameters Exceeding 90 th Percentile							
08/26/04	30.1	None							
10/21/04	51.0	TPO ₄	TP						
02/15/05	45.6	DO							
05/09/05	63.3	TPO ₄	TNO ₃	TP	TS				

Biological and Habitat Summary	
Number of Taxa	25
Diversity Index	2.32
RBP Score	36
RBP Condition	Nonimpaired
Total Habitat Score	151
Habitat Condition Category	Supporting



Water Quality Index



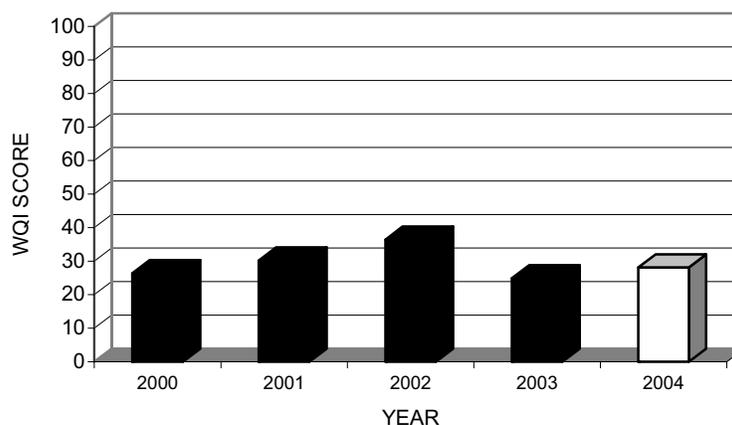
Biological Index

Table 24. Water Quality Summary Choconut Creek at Vestal Center, N.Y.

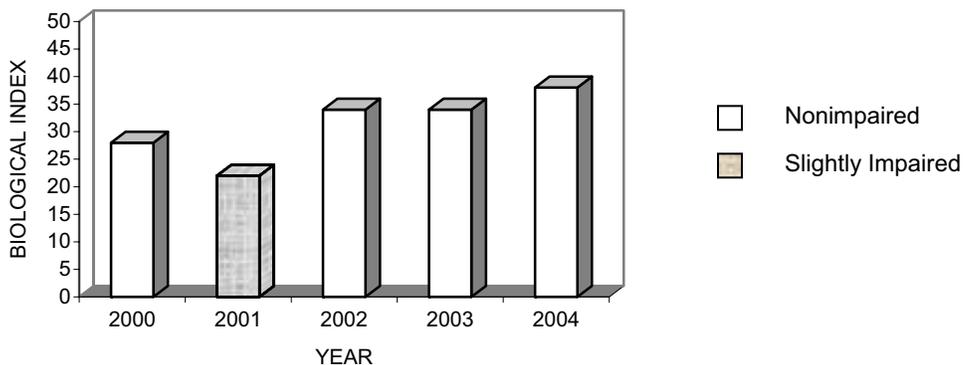
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TAI	7/20/04	226 ug/l	100 ug/l	NY aquatic (chronic)
TFe	7/20/04	442 ug/l	300 ug/l	NY aquatic (chronic)

Date	WQI	Parameters Exceeding 90 th Percentile						
7/20/04	28.1	None						

Biological and Habitat Summary	
Number of Taxa	25
Diversity Index	2.65
RBP Score	38
RBP Condition	Nonimpaired
Total Habitat Score	155
Habitat Condition Category	Excellent



Water Quality Index



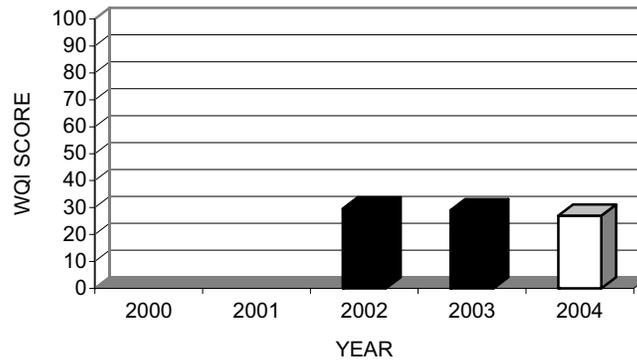
Biological Index

Table 25. Water Quality Summary Holden Creek at Woodhull, N.Y.

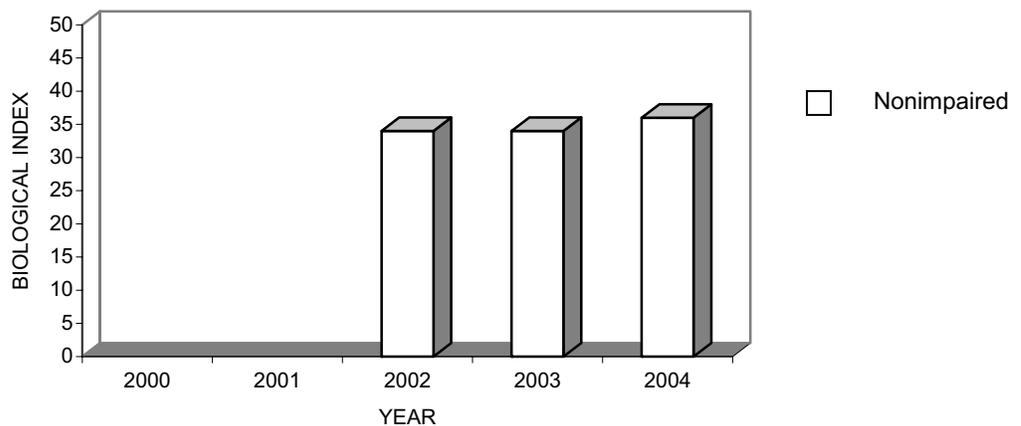
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile						
07/21/04	27.0	None						

Biological and Habitat Summary	
Number of Taxa	26
Diversity Index	2.67
RBP III Score	36
RBP III Condition	Nonimpaired
Total Habitat Score	172
Habitat Condition Category	Excellent



Water Quality Index



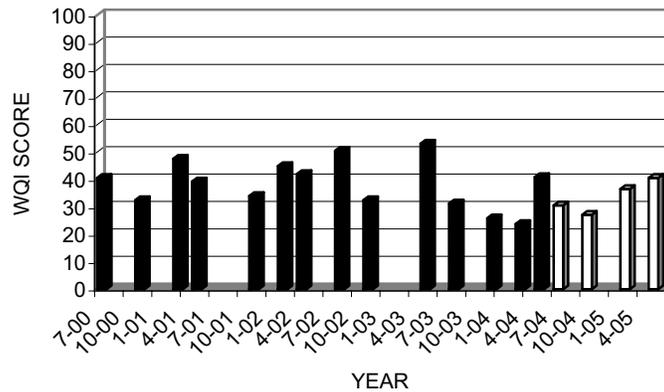
Biological Index

Table 26. Water Quality Summary Little Snake Creek at Brackney, Pa.

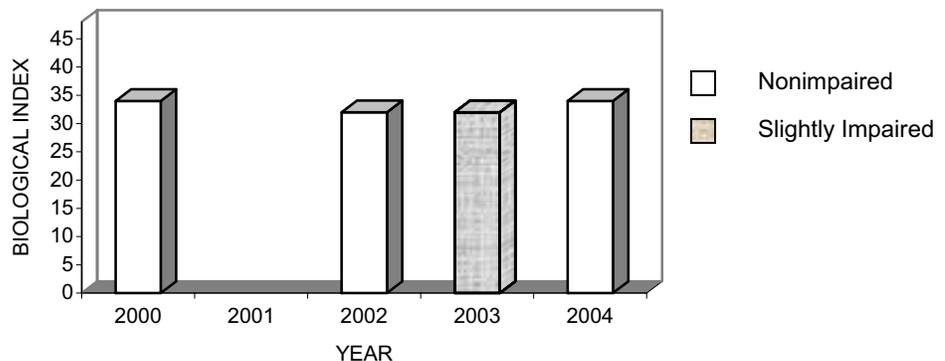
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TFe	07/19/04	602 ug/l	300 ug/l	NY aquatic (chronic)
TFe	10/20/04	345 ug/l	300 ug/l	PA public water supply
ALK	02/14/05	18 mg/l	20 mg/l	PA aquatic life
TFe	02/14/05	411 ug/l	300 ug/l	NY aquatic (chronic)
TAI	02/14/05	205 ug/l	100 ug/l	NY aquatic (chronic)
ALK	05/09/05	16 mg/l	20 mg/l	PA aquatic life

Date	WQI	Parameters Exceeding 90 th Percentile						
07/19/04	30.6	None						
10/20/04	27.2	None						
02/14/05	36.6	DO						
05/09/05	40.6	None						

Biological and Habitat Summary	
Number of Taxa	23
Diversity Index	2.38
RBP III Score	34
RBP III Condition	Nonimpaired
Total Habitat Score	168
Habitat Condition Category	Excellent



Water Quality Index



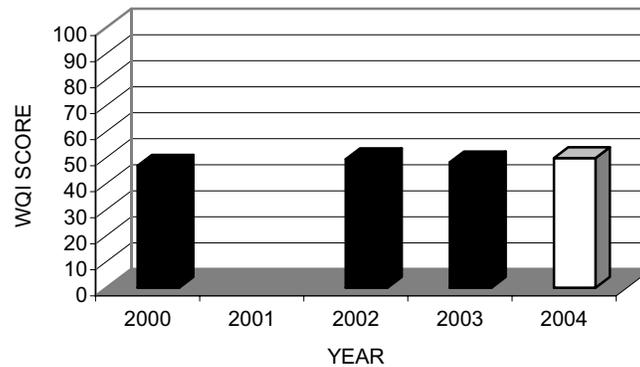
Biological Index

Table 27. Water Quality Summary North Fork Cowanesque River at North Fork, Pa.

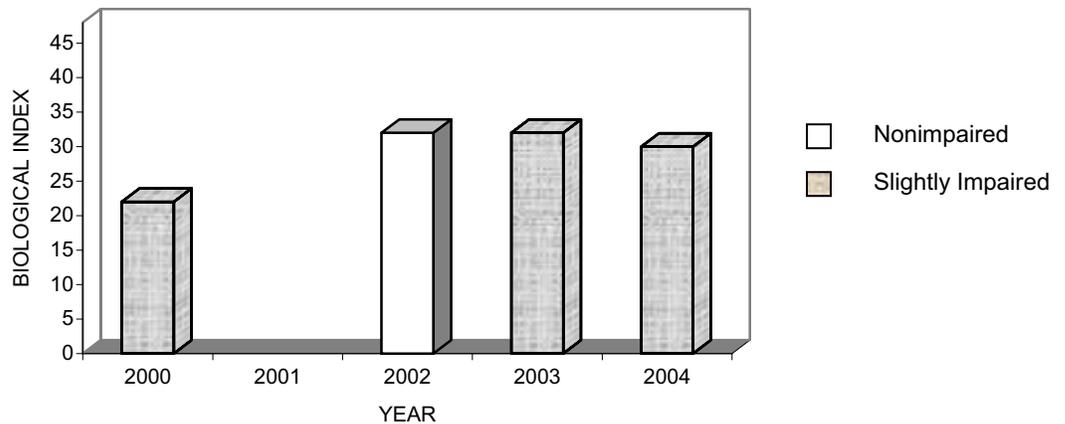
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TFe	07/21/04	375 ug/l	300 ug/l	NY aquatic (chronic)
TAI	07/21/04	209 ug/l	100 ug/l	NY aquatic (chronic)

Date	WQI	Parameters Exceeding 90 th Percentile						
07/21/04	49.8	TN	TNO3					

Biological and Habitat Summary	
Number of Taxa	19
Diversity Index	2.47
RBP III Score	32
RBP III Condition	Nonimpaired
Total Habitat Score	175
Habitat Condition Category	Excellent



Water Quality Index



Biological Index

Seeley Creek (SEEL 10.3)

During the 1999-2000 sampling season, Seeley Creek was added to the Group 1 streams in the ISWQN. In 2004, Seeley Creek at Seeley Creek, NY, (SEEL 10.3) contained a slightly impaired biological community for the third consecutive year, after being moderately impaired for the previous five years. However, this site had the worst scores for Hilsenhoff Biotic Index, percent Chironomidae, and percent dominant taxa of all the NY-PA border streams. Total aluminum exceeded NY water quality standards in October 2004. Dissolved oxygen exceeded the 90th percentile during three of the four sampling events (Table 28).

Habitat was rated as supporting in Seeley Creek, with low scores for riparian vegetative zone width, conditions of banks, and sediment deposition. Habitat conditions may be a possible cause for the impaired macroinvertebrate community. New York State Department of Conservation (NYSDEC) listed Seeley Creek as “threatened” in its publication, The 1998 Chemung River Basin Waterbody Inventory and Priority Waterbodies List (NYSDEC, 1998). According to this publication, the stream is threatened by habitat alteration, streambank erosion, and instability of the stream channel.

Snake Creek (SNAK 2.3)

Snake Creek at Brookdale, PA, (SNAK 2.3) had a nonimpaired biological community and excellent physical habitat. There were no parameters exceeding water quality standards or the 90th percentile at SNAK 2.3 during fiscal year 2005 (Table 29). The biological community has remained nonimpaired for the past eight years. Snake Creek supported many pollution intolerant taxa, including *Atherix* (Diptera: Athericidae), *Hexatoma* (Diptera: Tipulidae), *Leucrocuta* (Ephemeroptera: Heptageniidae), *Isonychia* (Ephemeroptera: Isonychiidae), *Paraleptophlebia* (Ephemeroptera: Leptophlebiidae), *Nigronia* (Megaloptera: Corydalidae), *Acroneuria* (Plecoptera: Perlidae), *Paragnetina* (Plecoptera: Perlidae), *Leuctra*, and *Dolophilodes* (Trichoptera: Philopotamidae). This site was given high habitat scores for epifaunal substrate, instream cover, and embeddedness.

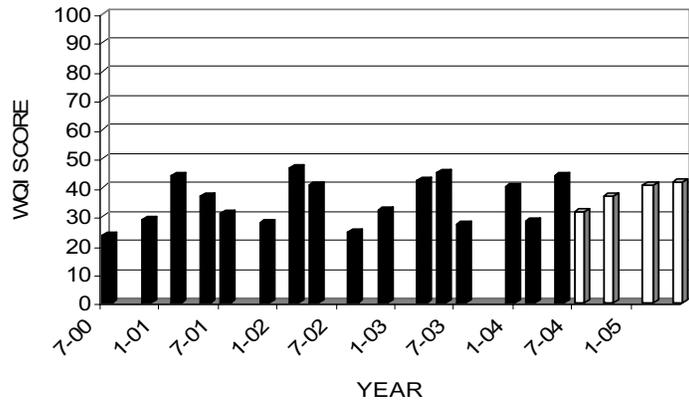
In 2000, SRBC staff conducted a small watershed study on the Snake Creek Watershed during the second year of the Upper Susquehanna Subbasin Survey (Diehl and Sitlinger, 2001). Ten sites in the Snake Creek Watershed and three sites on the Little Snake Creek Watershed were monitored during low and high flow for water quality, macroinvertebrates, and physical habitat. The study concluded that the Snake Creek Watershed was healthy and recommended that this watershed be protected. The Little Snake Creek Watershed showed signs of extensive dredging, and the study recommended that the riparian vegetation along areas of the stream be reestablished.

Table 28. Water Quality Summary Seeley Creek at Seeley Creek, N.Y.

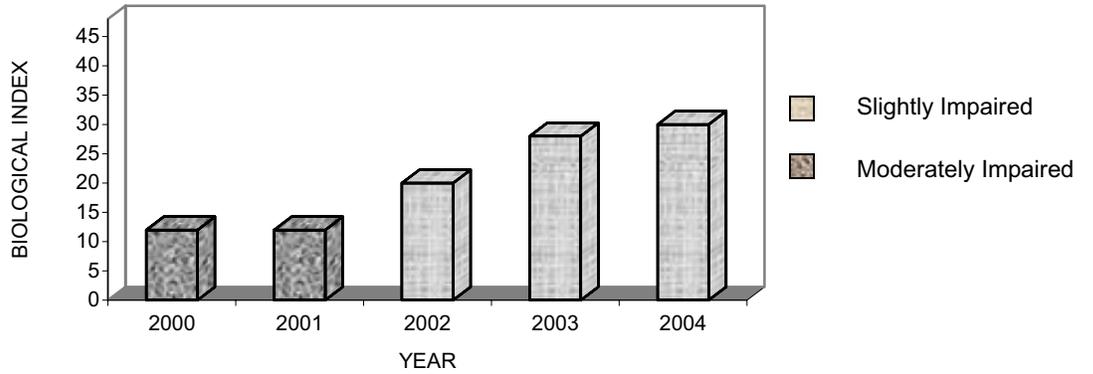
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TAI	10/21/04	200 ug/l	100 ug/l	NY aquatic (chronic)

Date	WQI	Parameters Exceeding 90 th Percentile						
07/20/04	31.5	DO	TEMP					
10/21/04	36.8	TOC						
02/15/05	40.6	DO						
05/10/05	41.7	DO	TEMP					

Biological and Habitat Summary	
Number of Taxa	21
Diversity Index	2.16
RBP III Score	30
RBP III Condition	Slightly Impaired
Total Habitat Score	153
Habitat Condition Category	Supporting



Water Quality Index



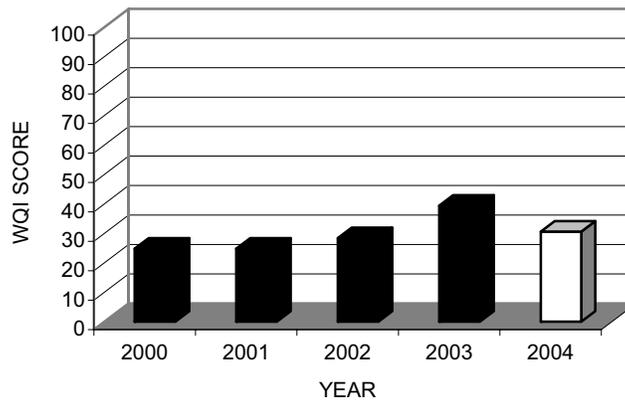
Biological Index

Table 29. Water Quality Summary Snake Creek at Brookdale, Pa.

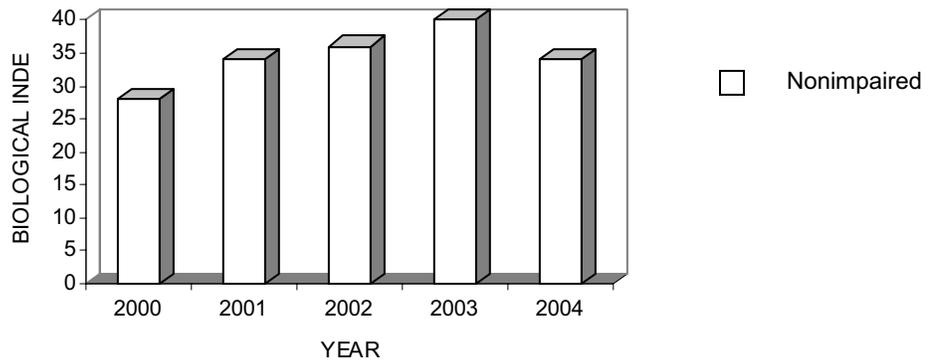
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile						
07/19/04	30.6	None						

Biological and Habitat Summary	
Number of Taxa	29
Diversity Index	2.70
RBP III Score	34
RBP III Condition	Nonimpaired
Total Habitat Score	160
Habitat Condition Category	Excellent



Water Quality Index



Biological Index

South Creek (SOUT 7.8)

During fiscal year 2005, South Creek at Fassett, PA, (SOUT 7.8) had a slightly impaired biological community for the second consecutive year. This site showed poor scores for EPT Index, Shannon Diversity Index, and percentage of Ephemeroptera.

Total iron exceeded New York water quality standards with a value of 787 µg/l in July 2004. Additionally, temperature and total organic carbon both exceeded the 90th percentile (Table 30). The habitat was rated supporting, with high scores for epifaunal substrate and embeddedness, but low scores for riparian vegetative zone width and channel alteration. Staff noted an abundance of algae covering much of the substrate. In past sampling seasons, staff has noted extremes in flow regimes; therefore, biological impairment at this site may be due to large fluctuations in flow and periodic drying of the streambed.

Troups Creek (TRUP 4.5)

Troups Creek at Austinburg, PA, (TRUP 4.5) had a slightly impaired biological community in July 2004 as it had the previous summer. Taxonomic richness was the lowest of the PA-NY border streams, and this site also had the worst scores for percent dominant taxa and percent Chironomidae. Staff noted the stream was very turbid, and there was evidence of recent high flow events and new point bar formation. The habitat was rated supporting, with low scores for epifaunal substrate, condition of banks, sediment deposition, and riparian vegetative zone width.

Total iron and total aluminum concentrations exceeded New York State water quality standards during three of the four sampling periods, including a February sample that also exceeded Pennsylvania water quality standards at 3,527 µg/l. Numerous parameters exceeded the 90th percentile, including total aluminum, total iron, turbidity, and total organic carbon (Table 31).

Trowbridge Creek (TROW 1.8)

Trowbridge Creek at Great Bend, PA, (TROW 1.8) showed nonimpaired biological conditions, after being slightly impaired last year. During July 2004, the macroinvertebrates at TROW 1.8 had good scores for EPT Index and percent Chironomidae. Total iron exceeded New York water quality standards in July 2004, although no parameters exceeded the 90th percentile (Table 32). Habitat was rated excellent, primarily due to high scores for epifaunal substrate, sediment deposition, instream cover, and channel flow status. However, low scores were given for riparian vegetative zone width and condition of banks.

Wappasening Creek (WAPP 2.6)

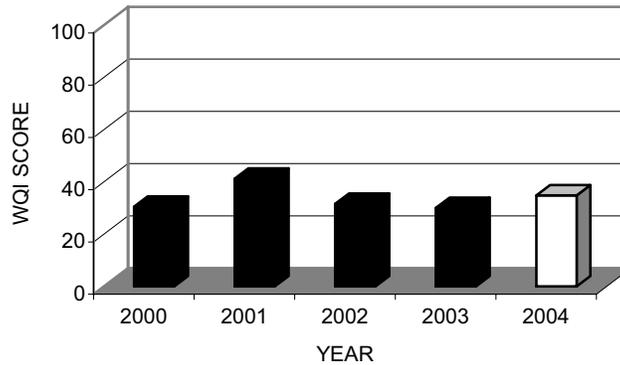
The biological index rating for Wappasening Creek at Nichols, NY, (WAPP 2.6) seems to be increasing over the past five years, improving from two years of moderately impaired and two years of slightly impaired to a nonimpaired ranking in July 2004 (Table 33). This site had the highest score for percent Ephemeroptera of all NY-PA border sites, as well as a good score for taxonomic richness. The habitat was rated excellent, with high scores for velocity/flow regimes, epifaunal substrate, instream cover, and riparian vegetative zone width. Staff noted evidence of recent extremely high flows at the time of sampling, as well as an abundance of algae covering the stream bed. No parameters exceeded water quality standards or the 90th percentile.

Table 30. Water Quality Summary South Creek at Fassett, Pa.

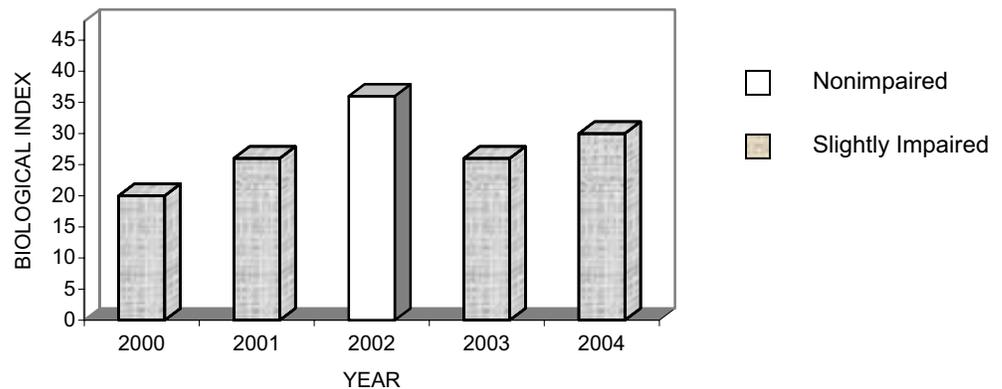
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TFe	07/20/04	787 ug/l	300 ug/l	NY aquatic (chronic)

Date	WQI	Parameters Exceeding 90 th Percentile						
07/20/04	34.8	TEMP	TOC					

Biological and Habitat Summary	
Number of Taxa	20
Diversity Index	2.19
RBP III Score	30
RBP III Condition	Slightly Impaired
Total Habitat Score	149
Habitat Condition Category	Supporting



Water Quality Index



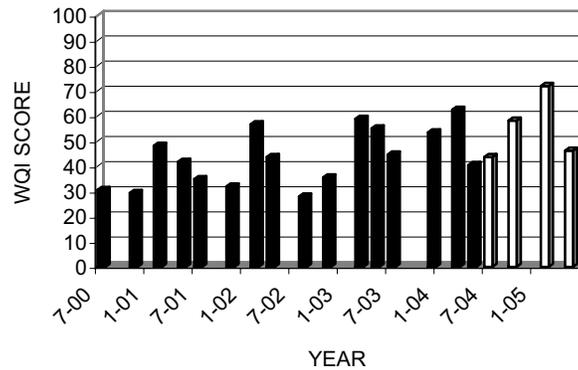
Biological Index

Table 31. Water Quality Summary Troups Creek at Austinburg, Pa.

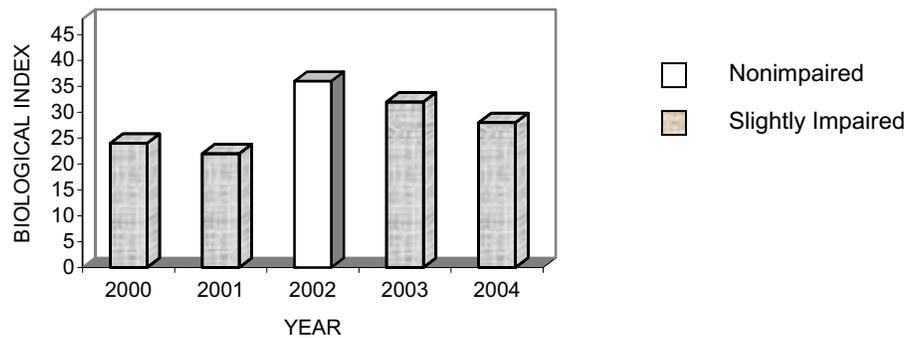
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TFe	07/21/04	462 ug/l	300 ug/l	NY aquatic (chronic)
TAI	07/21/04	371 ug/l	100 ug/l	NY aquatic (chronic)
TFe	10/21/04	2000 ug/l	300 ug/l	NY aquatic (chronic)
TAI	10/21/04	1760 ug/l	100 ug/l	NY aquatic (chronic)
TFe	02/16/05	3527 ug/l	1500 ug/l	PA aquatic life
TFe	02/16/05	3527 ug/l	300 ug/l	NY aquatic (chronic)
TAI	02/16/05	3843 ug/l	100 ug/l	NY aquatic (chronic)

Date	WQI	Parameters Exceeding 90 th Percentile							
07/21/04	43.7	None							
10/21/04	58.2	TAI	TFe	TURB					
02/16/05	72.0	TAI	TFe	TP	TS	TURB	SS		
05/10/05	46.2	TOC							

Biological and Habitat Summary	
Number of Taxa	16
Diversity Index	1.90
RBP Score	28
RBP Condition	Slightly Impaired
Total Habitat Score	143
Habitat Condition Category	Supporting



Water Quality Index



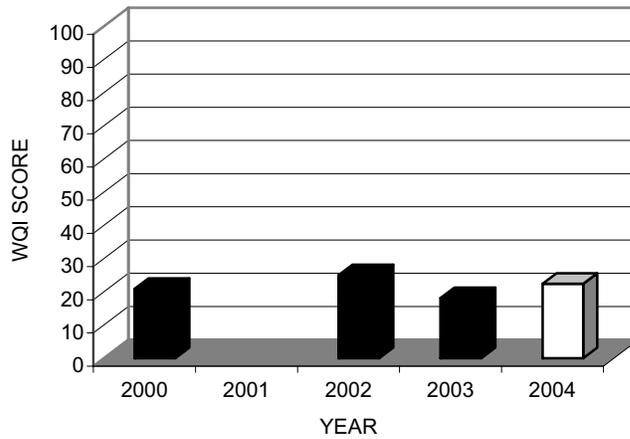
Biological Index

Table 32. Water Quality Summary Trowbridge Creek at Great Bend, Pa.

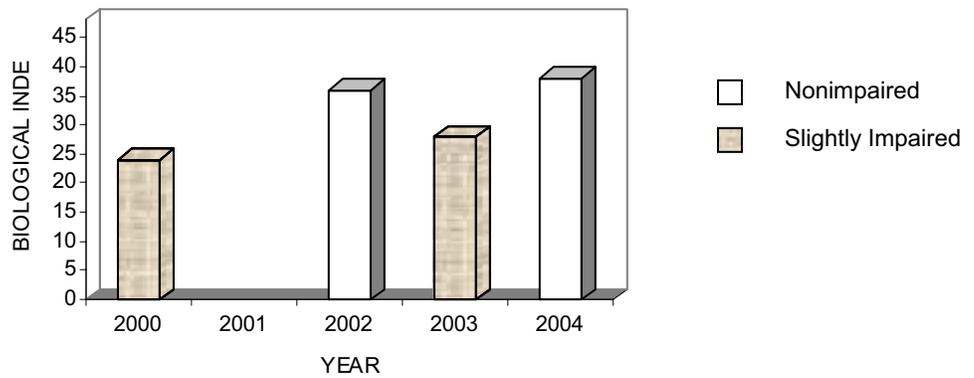
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TFe	07/19/04	337 ug/l	300 ug/l	NY aquatic (chronic)

Date	WQI	Parameters Exceeding 90 th Percentile						
07/19/04	22.4	None						

Biological and Habitat Summary	
Number of Taxa	23
Diversity Index	2.44
RBP III Score	38
RBP III Condition	Nonimpaired
Total Habitat Score	157
Habitat Condition Category	Excellent



Water Quality Index



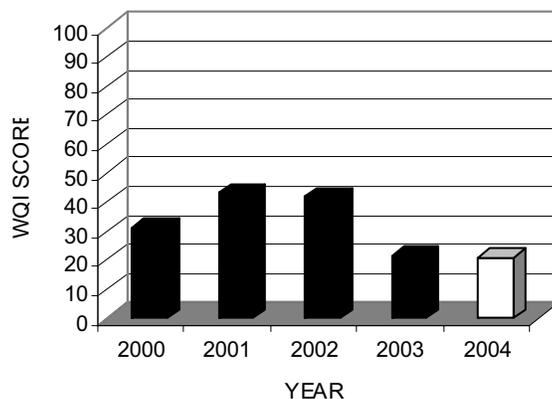
Biological Index

Table 33. Water Quality Summary Wappasening Creek at Nichols, N.Y.

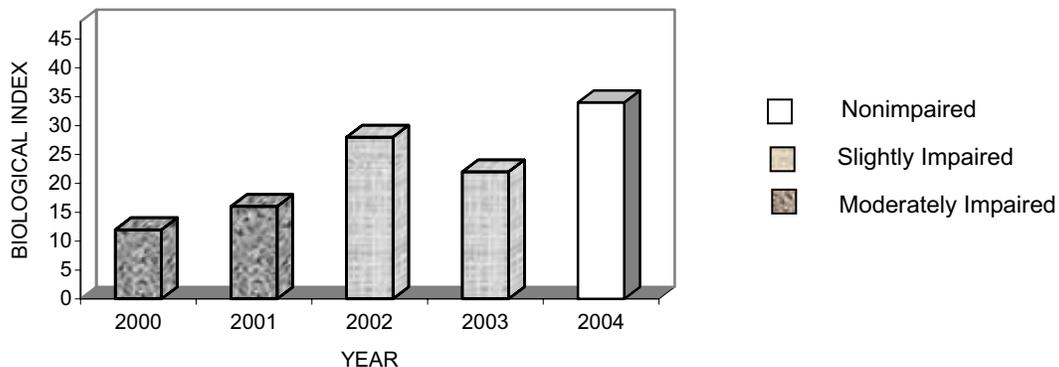
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile					
08/25/04	21.0	None					

Biological and Habitat Summary	
Number of Taxa	23
Diversity Index	2.33
RBP Score	34
RBP Condition	Nonimpaired
Total Habitat Score	163
Habitat Condition Category	Excellent



Water Quality Index



Biological Index

Pennsylvania-Maryland Streams

Big Branch Deer Creek (BBDC 4.1)

Big Branch Deer Creek at Fawn Grove, PA, (BBDC 4.1) had a nonimpaired biological community during fiscal year 2005, as it has for at least the past seven years. It had the highest taxonomic richness of the Maryland-Pennsylvania sites and good scores for Hilsenhoff Biotic Index, Shannon Diversity Index, and EPT Index; however, the community scored poorly for percentage of Ephemeroptera. Water quality was good in Big Branch Deer Creek in July 2004, with no parameters exceeding PA state standards and only dissolved oxygen exceeding the 90th percentile (Table 34). BBDC 4.1 had one of the best habitat conditions of all the PA-Maryland border sites, with high scores for a number of parameters, including epifaunal substrate, instream cover, and frequency of riffles.

Conowingo Creek (CNWG 4.4)

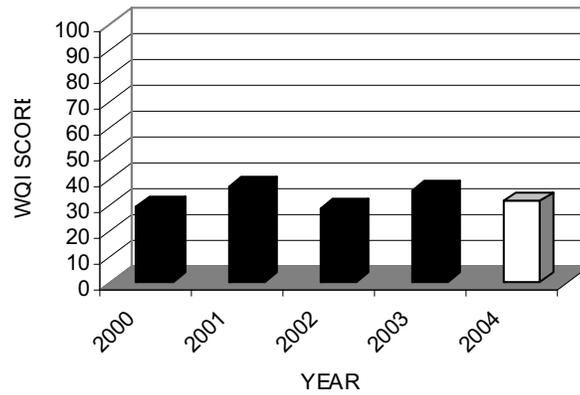
Conowingo Creek at Pleasant Grove, PA, (CNWG 4.4) had a slightly impaired community for the fifth year in a row, with a very low taxonomic richness and EPT Index and the poorest score of all Maryland-Pennsylvania streams for Hilsenhoff Biotic Index. This stream was impacted primarily by agricultural activities, as evidenced by high sediment deposition and elevated nutrients. Parameters that exceeded the 90th percentile were predominantly nutrients and dissolved oxygen (Table 35). Nitrate plus nitrite exceeded the Pennsylvania standards for public water supply during all four sampling events: August 2004, October 2004, February 2005, and May 2005. Habitat was rated as excellent, with high scores for instream cover and channel flow status.

Table 34. Water Quality Summary Big Branch Deer Creek at Fawn Grove, Pa.

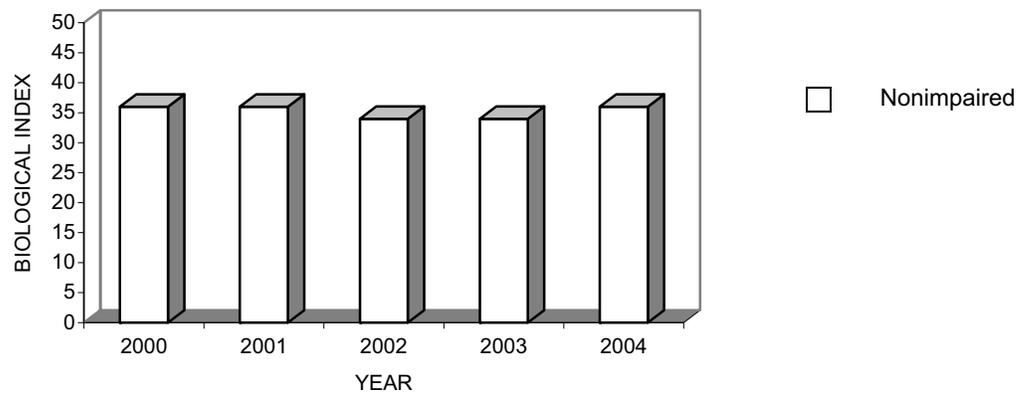
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile						
07/14/04	31.5	DO						

Biological and Habitat Summary	
Number of Taxa	26
Diversity Index	2.64
RBP Score	36
RBP Condition	Nonimpaired
Total Habitat Score	162
Habitat Condition Category	Excellent



Water Quality Index



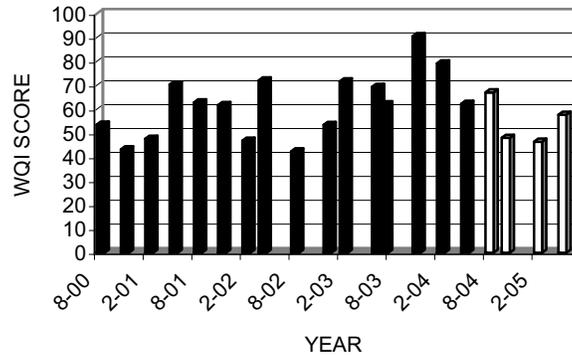
Biological Index

Table 35. Water Quality Summary Conowingo Creek at Pleasant Grove, Pa.

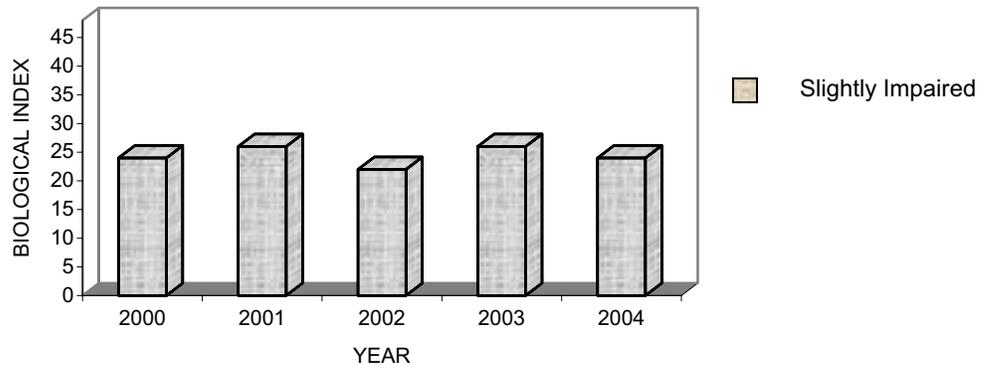
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
Nitrate + Nitrite	08/9/04	11.21 mg/l	10 mg/l	PA public water supply
Nitrate + Nitrite	10/14/04	11.84 mg/l	10 mg/l	PA public water supply
Nitrate + Nitrite	02/8/05	11.09 mg/l	10 mg/l	PA public water supply
Nitrate + Nitrite	05/03/05	11.55 mg/l	10 mg/l	PA public water supply

Date	WQI	Parameters Exceeding 90 th Percentile						
08/9/04	67.1	TNH3	TNO3	TNO2	TN			
10/14/04	48.1	DO	TNO3	TN				
02/8/05	46.5	DO	TNO3					
05/03/05	57.8	DO	COND	TNO3	TN	TS		

Biological and Habitat Summary	
Number of Taxa	13
Diversity Index	2.03
RBP III Score	24
RBP III Condition	Slightly Impaired
Total Habitat Score	162
Habitat Condition Category	Excellent



Water Quality Index



Biological Index

Deer Creek (DEER 44.2)

Deer Creek at Gorsuch Mills, MD, (DEER 44.2) served as the reference site for fiscal year 2005. DEER 44.2 had the highest EPT Index and the lowest percent dominant taxa of the PA-MD streams, as well as a high taxonomic richness and low percent Chironomidae. Organic-pollution intolerant organisms included: *Atherix*, *Antocha* (Diptera: Tipulidae), *Isonychia*, *Nigronia*, *Stylogomphus* (Odonata: Gomphidae), *Leuctra*, *Acroneuria*, *Agnatina* (Plecoptera: Perlidae), and *Paragnetina*. This site had fairly good water quality, with no parameters exceeding standards. However, during each of the four sampling periods dissolved oxygen exceeded the 90th percentile, and temperature and total chloride each exceeded the 90th percentile one time (Table 36). This sampling site was located adjacent to agricultural activities.

Ebaughs Creek (EBAU 1.5)

Ebaughs Creek at Stewartstown, PA, (EBAU 1.5) had a slightly impaired macroinvertebrate community in July 2004, and the biological condition seemed to show some improvement from 2003. This site scored in the median range for the Maryland-Pennsylvania streams with regard to many of the metrics; including taxonomic richness, EPT Index, and percent Chironomidae. EBAU 1.5 usually has slightly or moderately impaired biological conditions, with the July 2001 rating of nonimpaired being an anomaly. Habitat was rated as excellent, with highest scores given for channel flow status and vegetative protective cover.

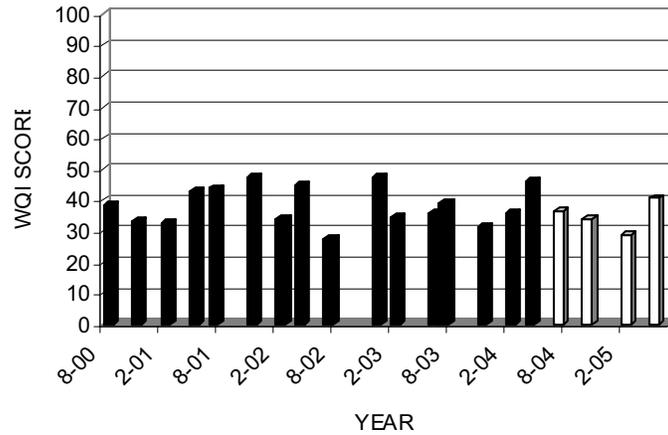
Total chlorine values exceeded state standards during three of the four sampling periods (Table 37). Parameters exceeding the 90th percentile at least two times during the year included total manganese, dissolved oxygen, and total nitrite. EBAU 1.5 is located downstream of the Stewartstown Treatment Plant.

Table 36. Water Quality Summary Deer Creek at Gorsuch Mills, Md.

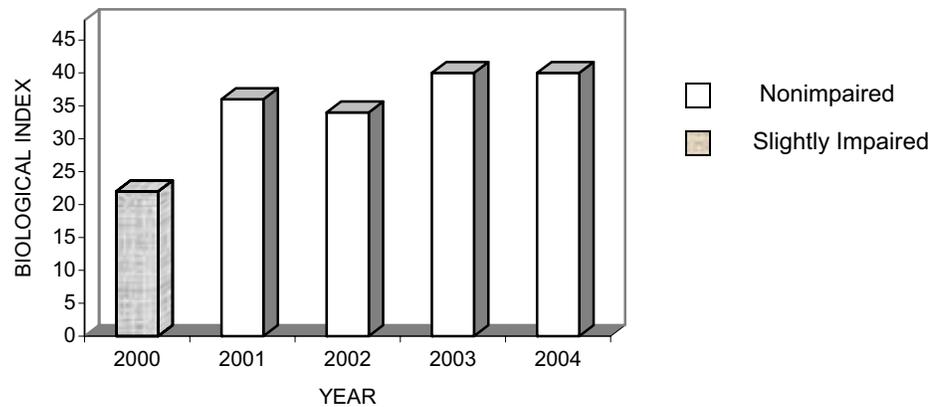
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile						
07/13/04	36.7	DO	TEMP					
10/13/04	33.9	DO						
02/07/05	28.6	DO						
05/02/05	40.7	DO	TCI					

Biological and Habitat Summary	
Number of Taxa	25
Diversity Index	2.55
RBP Score	40
RBP Condition	Reference
Total Habitat Score	154
Habitat Condition Category	Reference



Water Quality Index



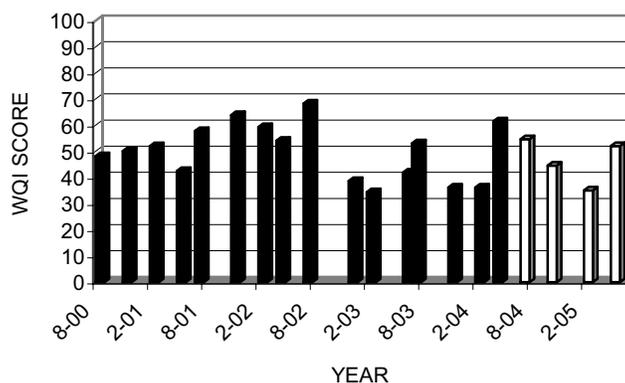
Biological Index

Table 37. Water Quality Summary Ebaughs Creek at Stewartstown, Pa.

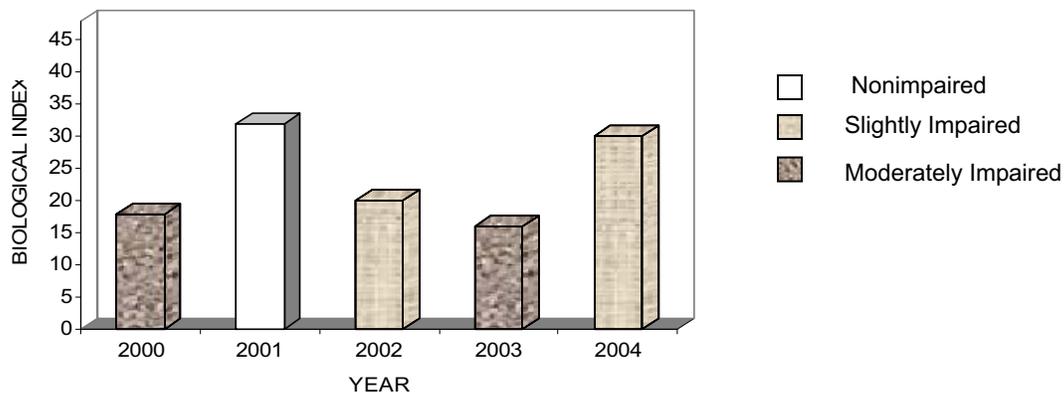
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TCIn	07/13/04	0.06 mg/l	0.019 mg/l	MD aquatic life
TCIn	10/13/04	0.06 mg/l	0.019 mg/l	MD aquatic life
TCIn	05/02/05	0.07 mg/l	0.019 mg/l	MD aquatic life

Date	WQI	Parameters Exceeding 90 th Percentile						
07/13/04	54.7	DO	TMn					
10/13/04	44.6	TMn						
02/07/05	35.1	DO	TNO2					
05/02/05	52.1	DO	TNH3	TNO2				

Biological and Habitat Summary	
Number of Taxa	18
Diversity Index	2.14
RBP Score	30
RBP Condition	Slightly Impaired
Total Habitat Score	150
Habitat Condition Category	Excellent



Water Quality Index



Biological Index

Falling Branch Deer Creek (FBDC 4.1)

There were no macroinvertebrates present in the sample collected at Falling Branch Deer Creek at Fawn Grove, PA, (FBDC 4.1). The reason for this is unknown; however there was evidence of recent high flows, which may have negatively impacted the macroinvertebrate community. The habitat was rated as excellent, with a dense vegetative cover, high frequency of riffles, and an abundance of instream cover. Water quality was very good, with no parameters exceeding water quality standards and only dissolved oxygen exceeding the 90th percentile (Table 38).

Long Arm Creek (LNGA 2.5)

Long Arm Creek at Bandanna, PA, and (LNGA 2.5) had a slightly impaired biological community, which is an improvement from the previous two years. This site had low metric scores for Shannon Diversity Index and percent dominant taxa but scored as one of the highest sites in percent Ephemeroptera. LNGA 2.5 was previously used as a cow pasture, but SRBC staff noted in July 2004 that there was no evidence that the area surrounding the sampling station had been used as a pasture recently and that the stream banks were revegetated. These changes were reflected in the improved biological community. However, habitat conditions were rated as partially supporting when compared to other Maryland-Pennsylvania streams, due to low scores for epifaunal substrate, instream cover, embeddedness, sediment deposition, and riparian vegetative zone width.

During the 2000 sampling season, Long Arm Creek was elevated to a Group 1 stream. Although no water quality standards were exceeded in fiscal year 2005, both metals and nutrients, such as total aluminum, total phosphorus, and total orthophosphate, exceeded the 90th percentile at this site. Dissolved oxygen and conductivity also exceeded the 90th percentile (Table 39).

Octoraro Creek (OCTO 6.6)

Octoraro Creek at Rising Sun, MD, and (OCTO 6.6) had a slightly impaired biological community for the third consecutive year, with a low score for percent dominant taxa. However, it had the highest percent Ephemeroptera of all the Maryland-Pennsylvania streams. Unfortunately, a large number of these mayflies were the pollution-tolerant taxon, *Baetis* (Ephemeroptera: Baetidae). No parameters exceeded PA state standards during the sampling period. However, dissolved oxygen, temperature, total phosphorus, total orthophosphate, total solids, total organic carbon, turbidity, and conductivity all exceeded the 90th percentile. Total nitrogen and total nitrate were elevated but did not exceed the 90th percentile. Habitat was rated as excellent with high scores for epifaunal substrate, instream cover, and velocity/depth regimes.

Scott Creek (SCTT 3.0)

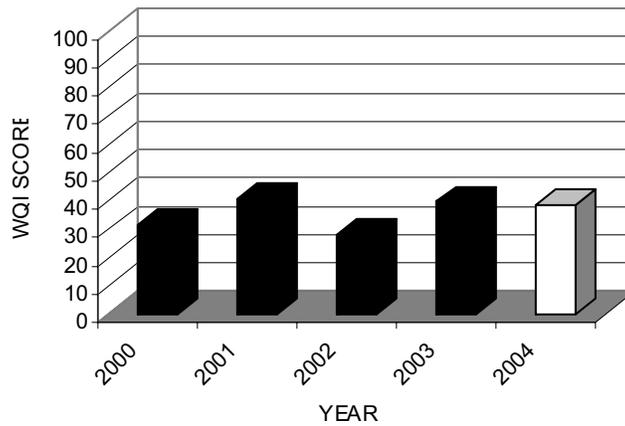
Scott Creek at Delta, PA (SCTT 3.0) was rated slightly impaired in July 2004, after being designated severely impaired for numerous years and moderately impaired last year. This site has consistently had the worst macroinvertebrate metric scores of all the Maryland-Pennsylvania sites. This year the conditions were similar, although there did appear to be some improvement. As in 2004, there were again several pollution sensitive organisms in the 2005 macroinvertebrate sample, including *Nigronia*, *Dicranota* (Diptera: Tipulidae), and *Dolophilodes*. No parameters exceeded state standards in fiscal year 2005; however, a variety of parameters, including dissolved oxygen, conductivity, total chloride, total sulfate, total phosphorus, total iron, and total organic carbon exceeded the 90th percentile. The habitat was rated supporting, with poor scores for riparian vegetative zone width, condition of banks, and channel alteration. SRBC staff noted an abundance of litter at the site during the time of sampling.

Table 38. Water Quality Summary Falling Branch Deer Creek at Fawn Grove, Pa.

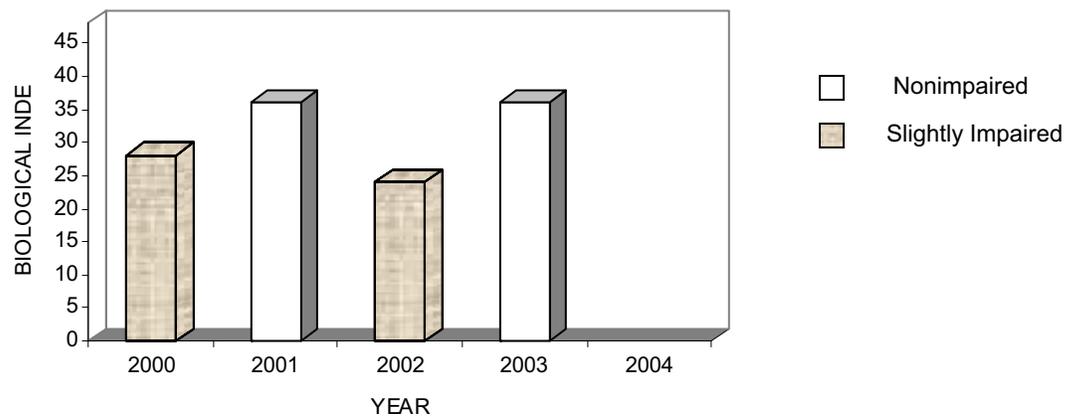
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile						
07/14/04	38.6	DO						

Biological and Habitat Summary	
Number of Taxa	NA
Diversity Index	NA
RBP Score	NA
RBP Condition	NA
Total Habitat Score	165
Habitat Condition Category	Excellent



Water Quality Index



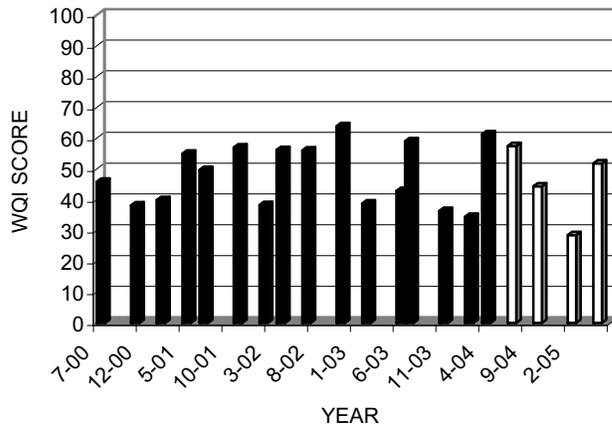
Biological Index

Table 39. Water Quality Summary Long Arm Creek at Bandanna, Pa.

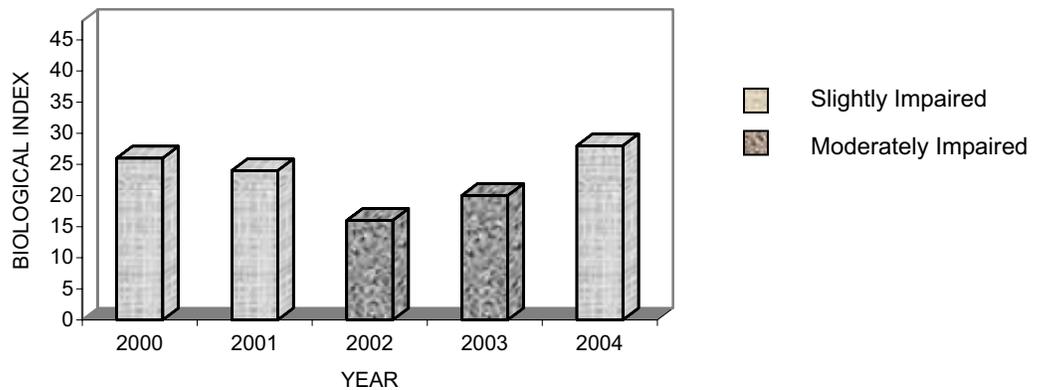
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile						
07/13/04	57.5	DO	COND	TAI				
10/13/04	44.4	None						
02/7/05	28.6	DO						
05/2/05	51.9	DO	TPO4	TP				

Biological and Habitat Summary	
Number of Taxa	16
Diversity Index	2.00
RBP III Score	28
RBP III Condition	Slightly Impaired
Total Habitat Score	109
Habitat Condition Category	Partially Supporting



Water Quality Index



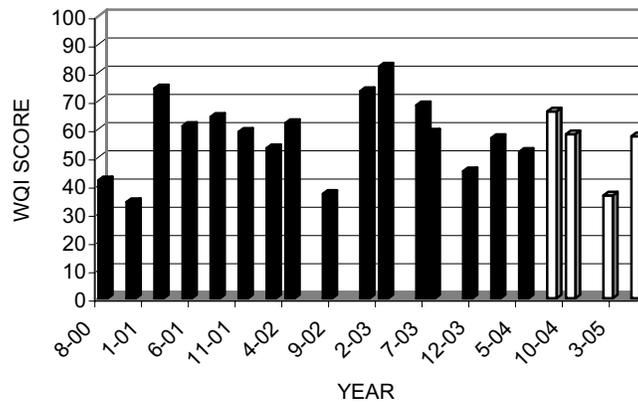
Biological Index

Table 40. Water Quality Summary Octoraro Creek at Rising Sun, Md.

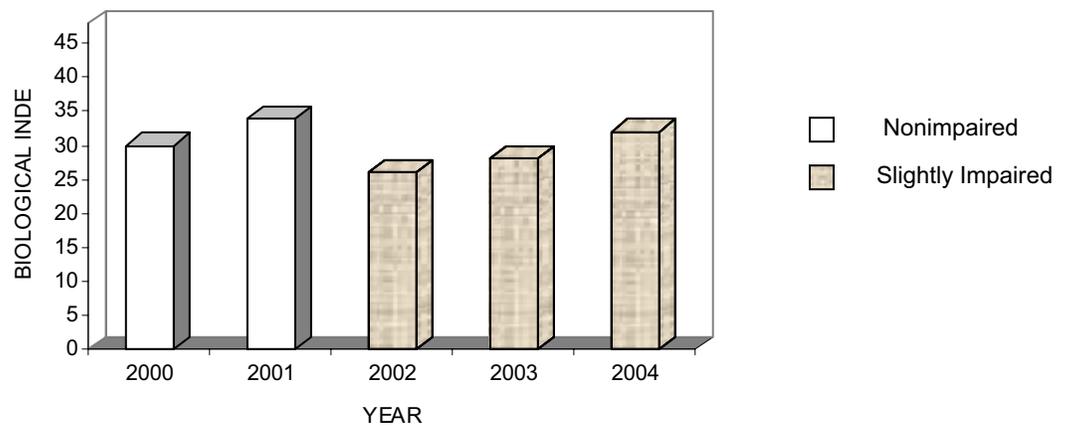
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile							
08/9/04	66.2	DO	TEMP	TPO4	TP	TOC	TURB		
10/14/04	58.2	DO	TEMP	TPO4	TP	TOC	TS		
02/08/05	36.4	DO							
05/03/05	57.4	DO	COND	TS					

Biological and Habitat Summary	
Number of Taxa	19
Diversity Index	2.23
RBP III Score	32
RBP III Condition	Slightly Impaired
Total Habitat Score	156
Habitat Condition Category	Excellent



Water Quality Index



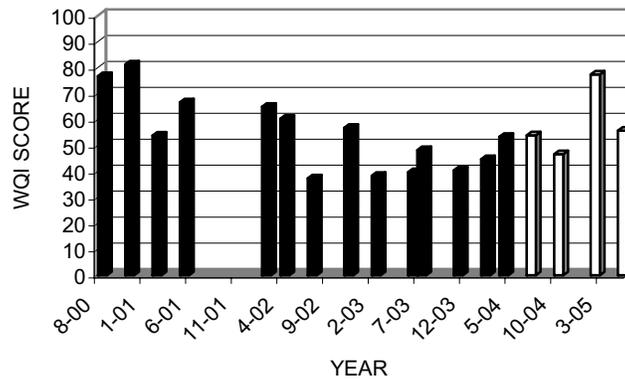
Biological Index

Table 41. Water Quality Summary Scott Creek at Delta, Pa.

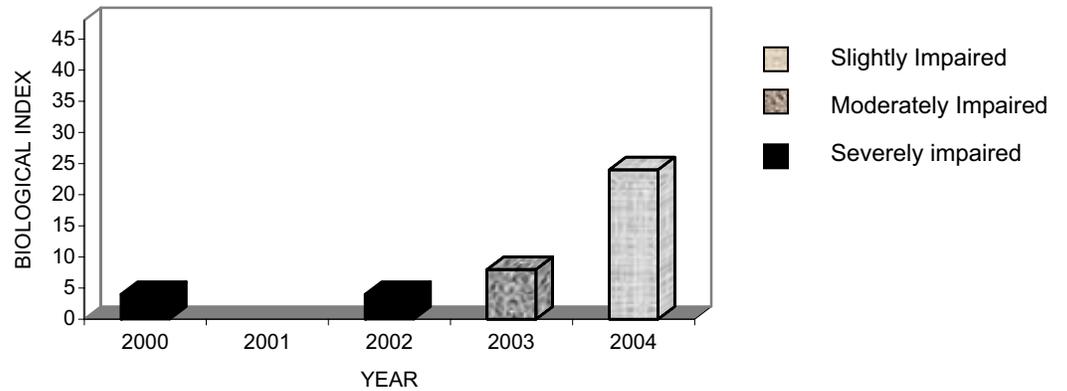
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile								
07/14/04	53.9	DO	TCI	TFe	TS	TSO4				
10/13/04	46.6	DO	COND	TCI	TS					
02/07/05	77.3	DO	COND	TNH3	TCI	TMn	TN	TPO4	TP	TS
		TSO4	TOC							
05/02/05	55.7	DO	SS	TCI	TFe	TMn				

Biological and Habitat Summary	
Number of Taxa	12
Diversity Index	2.05
RBP III Score	24
RBP III Condition	Slightly Impaired
Total Habitat Score	136
Habitat Condition Category	Supporting



Water Quality Index



Biological Index

South Branch Conewago Creek (SBCC 20.4)

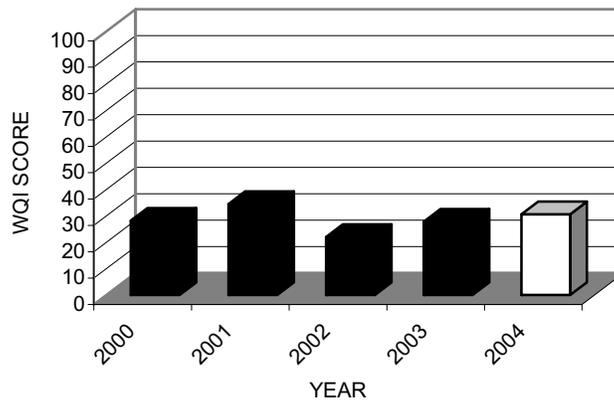
South Branch Conewago Creek near Bandanna, PA, and (SBCC 20.4) contained a slightly impaired biological community, as it has been for five of the last six years. This site had low scores for Shannon Diversity Index and percent dominant taxa, but high scores for Hilsenhoff Biotic Index and percent Chironomidae. No water quality standards were exceeded, and only dissolved oxygen exceeded the 90th percentile (Table 42). The habitat was rated excellent, with high scores for epifaunal substrate, frequency of riffles, and riparian vegetative zone. However, SRBC staff noted a lack of cobble and a large amount of sediment deposition.

Table 42. Water Quality Summary South Branch Conewago Creek at Bandanna, Pa.

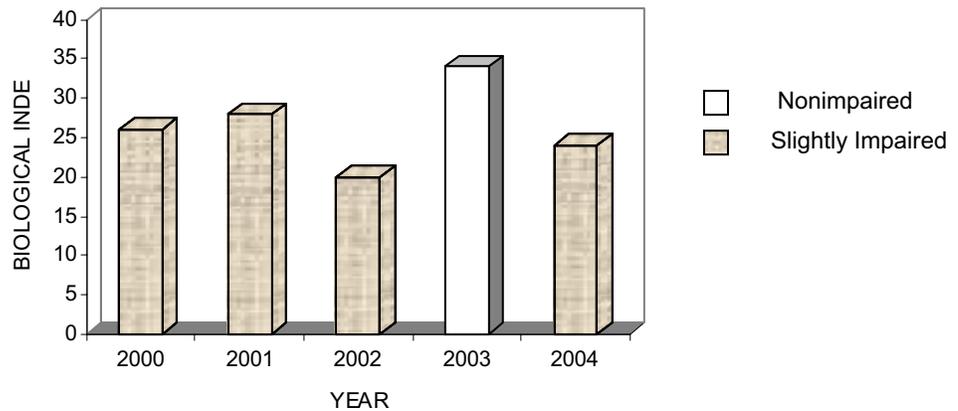
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile						
07/13/04	30.6	DO						

Biological and Habitat Summary	
Number of Taxa	14
Diversity Index	1.85
RBP III Score	24
RBP III Condition	Slightly Impaired
Total Habitat Score	146
Habitat Condition Category	Excellent



Water Quality Index



Biological Index

River Sites

Chemung River (CHEM 12.0)

Due to high flows throughout the sampling season, no macroinvertebrate sample was collected at the Chemung River at Chemung, NY, (CHEM 12.0). Total iron and total aluminum exceeded the New York water quality standards during September and October 2004 and February 2005. Numerous parameters exceeded the 90th percentile including conductivity, total chloride, total solids, total nitrate, and total organic carbon, among others (Table 43). The WQI scores for this site seem to have decreased slightly, indicating an improvement in overall water quality.

Cowanesque River (COWN 2.2)

The Cowanesque River downstream of the Cowanesque Reservoir (COWN 2.2) at Lawrenceville, PA, had a moderately impaired biological community in July 2004. This site is routinely rated as moderately impaired, and this year it showed very low scores for taxonomic richness, Shannon Diversity Index, EPT Index, percent Ephemeroptera, and percent Chironomidae. Since very few macroinvertebrate samples were collected on the larger rivers due to high flow conditions, COWN 2.2 was compared to CASC 1.6, the reference station for NY-PA border streams for fiscal year 2005. Habitat was rated as supporting, and the site was given low scores for riparian vegetative zone width, epifaunal substrate, instream cover, and sediment deposition.

Total iron and total aluminum exceeded New York state standards in October 2004 (Table 44). A variety of parameters exceeded the 90th percentile at COWN 2.2, including dissolved oxygen, temperature, total phosphorus, and total organic carbon.

Cowanesque River (COWN 1.0)

A site was added on the Cowanesque River near the mouth of the stream (COWN 1.0) during the 1999-2000 sampling season to determine the extent of impairment in the river. Biological condition at COWN 1.0 was rated as nonimpaired in July 2004 after being moderately impaired for two of the last three years (no sample was taken last year due to high flows). COWN 1.0 also was compared to CASC 1.6 due to lack of macroinvertebrates collected at river sites. Habitat was rated as supporting, with the lowest scores given for channel sinuosity, riparian vegetative zone, and condition of banks.

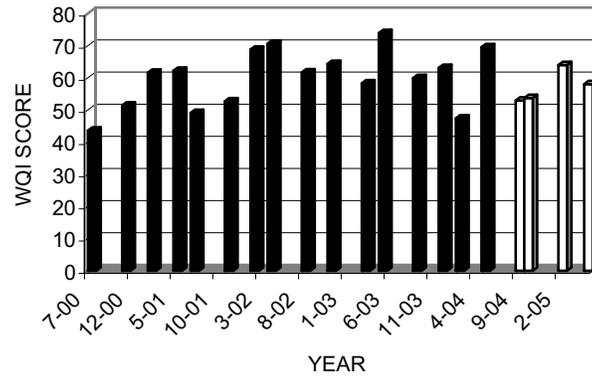
Total iron, total aluminum and total chlorine exceeded the New York water quality standards during the October sampling period. Parameters that exceeded the 90th percentile included dissolved oxygen, temperature, turbidity, total organic carbon, and various nutrients (Table 45). The Cowanesque Reservoir and a wastewater treatment plant discharge are located upstream of COWN 1.0.

Table 43. Water Quality Summary Chemung River at Chemung, N.Y.

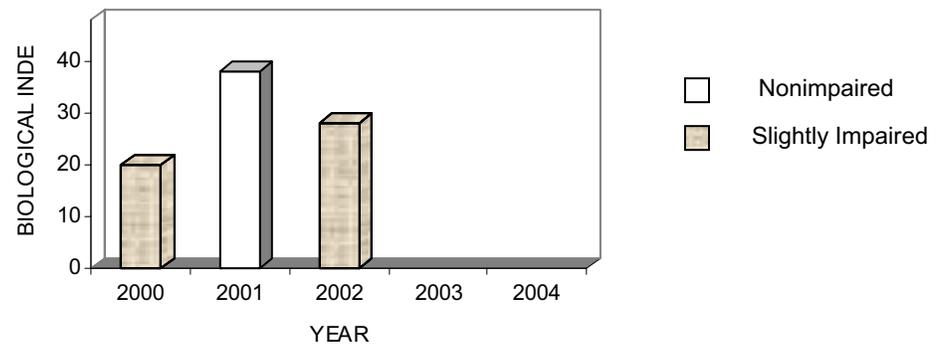
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TFe	09/29/04	698 ug/l	300 ug/l	NY aquatic (chronic)
TAI	09/29/04	382 ug/l	100 ug/l	NY aquatic (chronic)
TFe	10/20/04	344 ug/l	300 ug/l	NY aquatic (chronic)
TAI	10/20/04	255 ug/l	100 ug/l	NY aquatic (chronic)
TFe	02/15/05	582 ug/l	300 ug/l	NY aquatic (chronic)
TAI	02/15/05	534 ug/l	100 ug/l	NY aquatic (chronic)

Date	WQI	Parameters Exceeding 90 th Percentile						
09/29/04	53.0	COND	TCI	TS				
10/20/04	53.7	COND	TNO3	TS	TCI	TN		
02/15/05	64.0	COND	DO	TCI	TNO3	TS	TOC	
05/10/05	58.0	COND	TEMP	TCI	TN	TS	TOC	

Biological and Habitat Summary	
Number of Taxa	NA
Diversity Index	NA
RBP Score	NA
RBP Condition	NA
Total Habitat Score	NA
Habitat Condition Category	NA



Water Quality Index



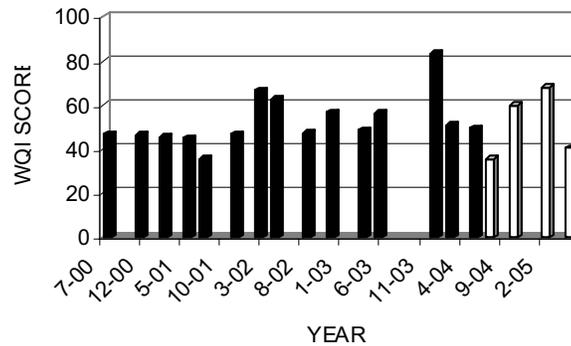
Biological Index

Table 44. Water Quality Summary Cowanesque River (COWN 2.2) at Lawrenceville, Pa.

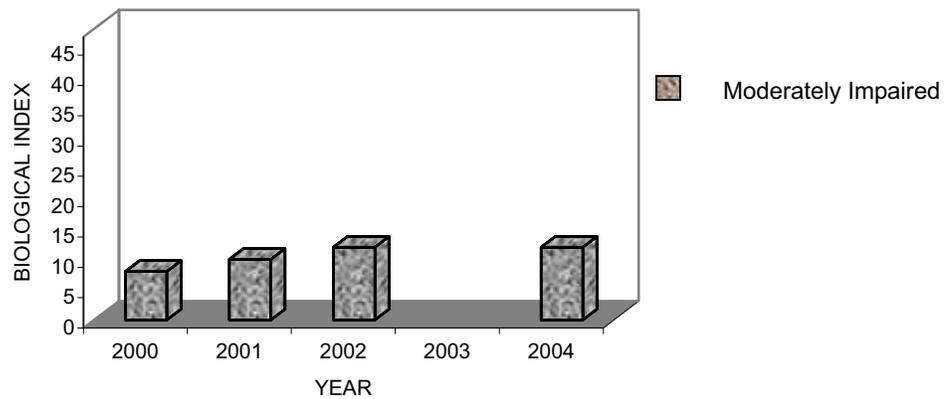
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TFe	10/21/04	759 ug/l	300 ug/l	NY aquatic (chronic)
TAI	10/21/04	631 ug/l	100 ug/l	NY aquatic (chronic)

Date	WQI	Parameters Exceeding 90 th Percentile						
07/22/04	35.7	DO	TEMP	TNH3				
10/21/04	59.9	DO	TEMP	TOC				
02/16/05	68.1	DO	TEMP	TPO4	TP	TOC		
05/10/05	40.7	DO						

Biological and Habitat Summary	
Number of Taxa	13
Diversity Index	1.62
RBP Score	12
RBP Condition	Moderately Impaired
Total Habitat Score	129
Habitat Condition Category	Partially Supporting



Water Quality Index



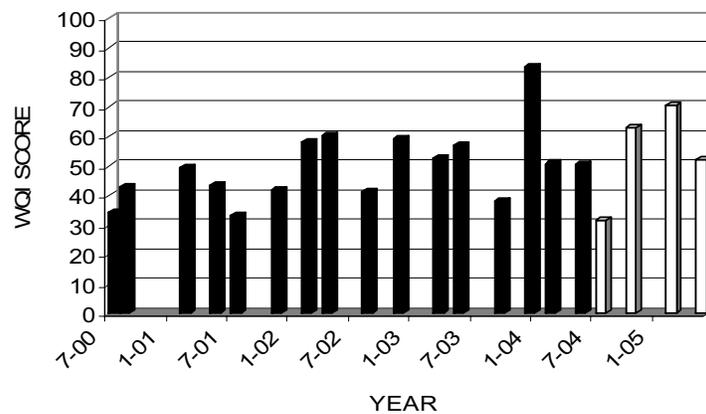
Biological Index

Table 45. Water Quality Summary Cowanesque River (COWN 1.0) at Lawrenceville, Pa.

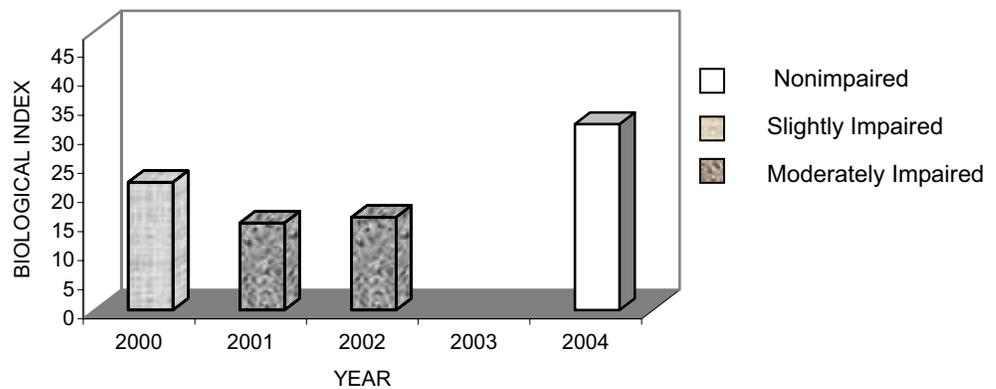
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TFe	10/21/04	1090 ug/l	300 ug/l	NY aquatic (chronic)
TAl	10/21/04	972 ug/l	100 ug/l	NY aquatic (chronic)
TCIn	10/21/04	1.0 mg/l	0.019 mg/l	NY aquatic (acute)

Date	WQI	Parameters Exceeding 90 th Percentile							
07/21/04	31.4	TEMP							
10/21/04	62.9	DO	TEMP	TNH3	TOC				
02/16/05	70.8	DO	TEMP	TN	TPO4	TP	TOC		
05/10/05	52.3	DO	TOC	TURB					

Biological and Habitat Summary	
Number of Taxa	20
Diversity Index	2.26
RBP Score	32
RBP Condition	Nonimpaired
Total Habitat Score	145
Habitat Condition Category	Supporting



Water Quality Index



Biological Index

Susquehanna River at Windsor, NY (SUSQ 365.0)

The biological community at Susquehanna River at Windsor, NY, (SUSQ 365.0) was designated nonimpaired during fiscal year 2005 for the fourth consecutive year. Like both Cowanesque River sites, SUSQ 365.0 was compared to CASC 1.6, the reference station for the NY-PA border streams. This site showed high scores for taxonomic richness and EPT Index. Habitat was rated as excellent, with high ratings for epifaunal substrate, instream cover, and pool substrate characterization. Logs and woody debris were noted in the stream, as was the presence of deep pools and deep riffle/run areas.

Total iron slightly exceeded New York aquatic standards in October 2004 and February 2005. Dissolved oxygen, total ammonia, suspended sediment, and turbidity all exceeded the 90th percentile one time during the sample period at this site (Table 46).

Susquehanna River at Kirkwood, NY (SUSQ 340.0)

Due to high river flows throughout the 2004 sampling season, no macroinvertebrate sample was collected at Susquehanna River at Kirkwood, NY, (SUSQ 340.0). Total iron and total aluminum each exceeded New York water quality standards on two occasions. Additional water quality analysis indicated that total phosphorus, dissolved oxygen, and total solids all exceeded the 90th percentile one time (Table 47).

Susquehanna River at Sayre, PA. (SUSQ 289.1)

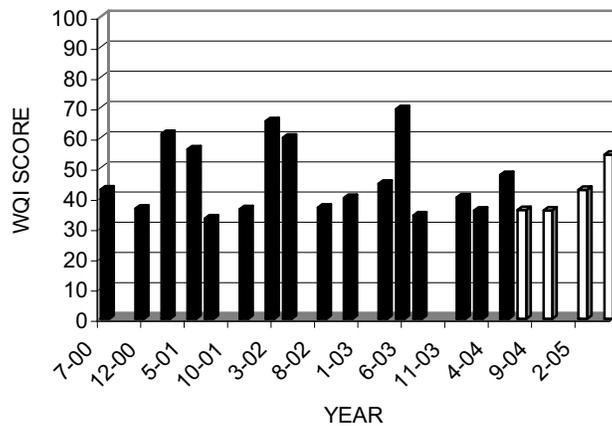
Due to high river flows throughout the 2004 sampling season, no macroinvertebrate sample was collected at the Susquehanna River at Sayre, PA, (SUSQ 289.1). Total aluminum and total iron exceeded New York water quality standards during September and October 2004 and February 2005. Other parameters that were elevated compared to other Group 1 and 2 NY-PA streams were total ammonia, total nitrogen, dissolved oxygen, and total chloride (Table 48).

Table 46. Water Quality Summary Susquehanna River (SUSQ 365.0) at Windsor, N.Y.

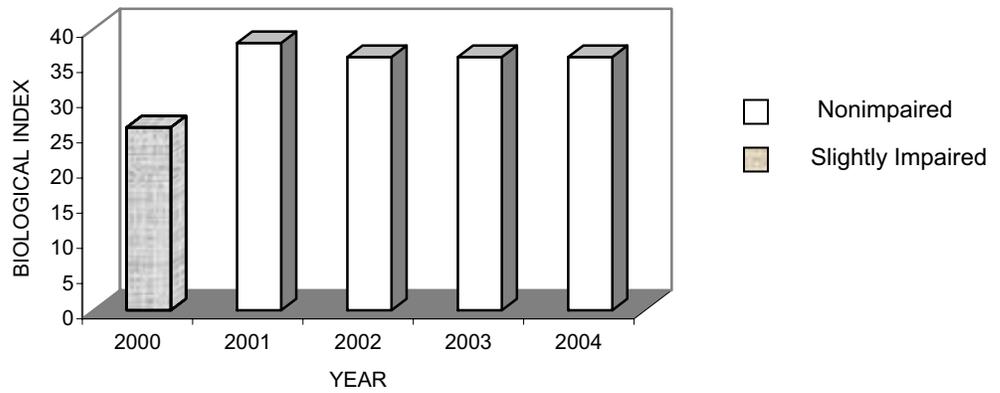
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TFe	10/20/04	326 ug/l	300 ug/l	NY aquatic (chronic)
TFe	02/14/05	339 ug/l	300 ug/l	NY aquatic (chronic)

Date	WQI	Parameters Exceeding 90 th Percentile							
07/19/04	36.0	DO							
10/20/04	35.9	None							
02/14/05	42.7	None							
05/09/05	54.4	TNH3	SS	TURB					

Biological and Habitat Summary	
Number of Taxa	23
Diversity Index	2.50
RBP Score	36
RBP Condition	Nonimpaired
Total Habitat Score	160
Habitat Condition Category	Excellent



Water Quality Index



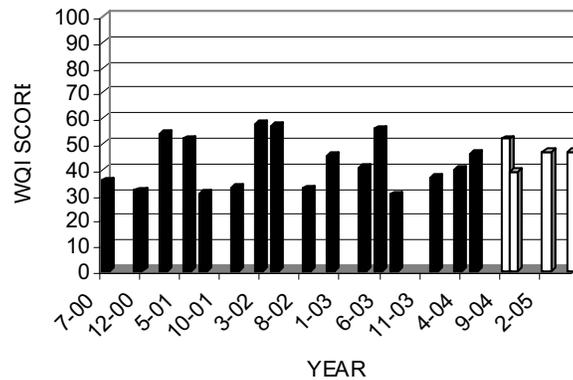
Biological Index

Table 47. Water Quality Summary Susquehanna River (SUSQ 340.0) at Kirkwood, N.Y.

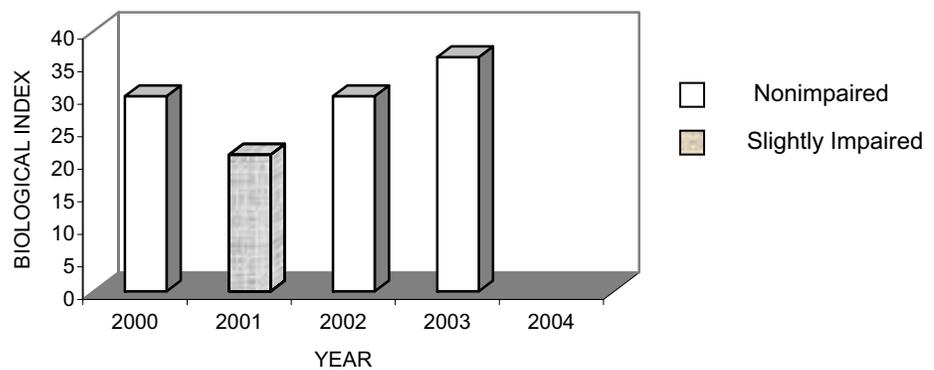
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TAI	09/29/04	1166 ug/l	100 ug/l	NY aquatic (chronic)
TFe	10/20/04	752 ug/l	300 ug/l	NY aquatic (chronic)
TAI	10/20/04	436 ug/l	100 ug/l	NY aquatic (chronic)
TFe	02/14/05	364 ug/l	300 ug/l	NY aquatic (chronic)

Date	WQI	Parameters Exceeding 90 th Percentile						
09/29/04	52.1	TP						
10/20/04	39.2	None						
02/14/05	46.8	DO	TS					
05/09/05	46.8	None						

Biological and Habitat Summary	
Number of Taxa	NA
Diversity Index	NA
RBP Score	NA
RBP Condition	NA
Total Habitat Score	NA
Habitat Condition Category	NA



Water Quality Index



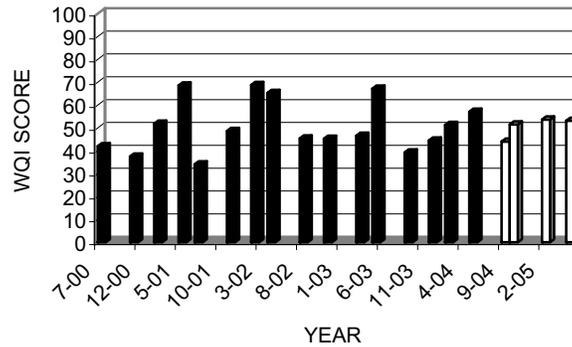
Biological Index

Table 48. Water Quality Summary Susquehanna River (SUSQ 289.1) at Sayre, Pa.

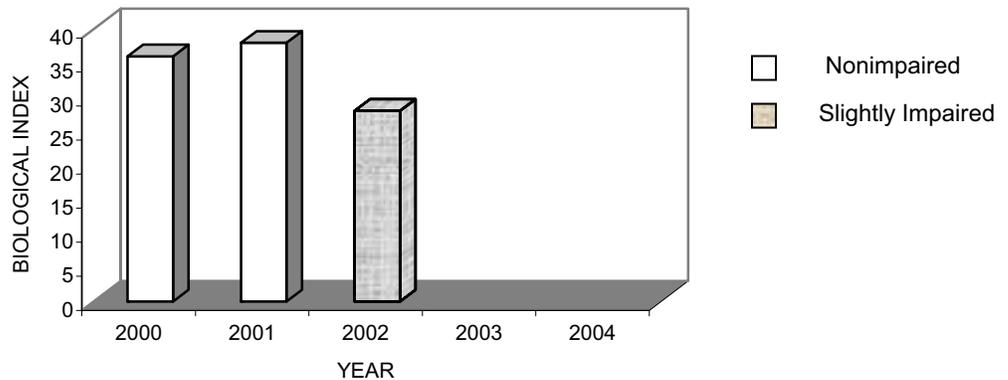
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TFe	09/29/04	911 ug/l	300 ug/l	NY aquatic (chronic)
TAI	09/29/04	546 ug/l	100 ug/l	NY aquatic (chronic)
TFe	10/21/04	589 ug/l	300 ug/l	NY aquatic (chronic)
TAI	10/21/04	319 ug/l	100 ug/l	NY aquatic (chronic)
TFe	02/14/05	513 ug/l	300 ug/l	NY aquatic (chronic)
TAI	02/14/05	280 ug/l	100 ug/l	NY aquatic (chronic)

Date	WQI	Parameters Exceeding 90 th Percentile						
09/29/04	44.0	None						
10/21/04	51.5	TNH3	TN					
02/14/05	53.7	DO	TNH3	TCl				
05/09/05	53.2	None						

Biological and Habitat Summary	
Number of Taxa	NA
Diversity Index	NA
RBP Score	NA
RBP Condition	NA
Total Habitat Score	NA
Habitat Condition Category	NA



Water Quality Index



Biological Index

Susquehanna River at Marietta, PA (SUSQ 44.5)

As river flows were very high throughout summer 2004, no macroinvertebrate sample or habitat information was collected on the Susquehanna River at Marietta, PA, (SUSQ 44.5). No parameters exceeded Pennsylvania or Maryland water quality standards during the sampling period. Several parameters did exceed the 90th percentile multiple times, including dissolved oxygen, total sulfate, total iron, and total organic carbon (Table 49).

Susquehanna River at Conowingo, MD (SUSQ 10.0)

No macroinvertebrate sampling was performed in the Susquehanna River at Conowingo, MD, (SUSQ 10.0) due to deep waters and a lack of riffle habitat. During this sampling season, no parameters exceeded Pennsylvania or Maryland state standards. Parameters that exceeded the 90th percentile included temperature, dissolved oxygen, total sulfate, total manganese, conductivity, and turbidity (Table 50).

Tioga River (TIOG 10.8)

No macroinvertebrate sampling or habitat assessments occurred during 2004 on the Tioga River at Lindley, NY, (TIOG 10.8) due to high flows throughout the sampling season. Total aluminum exceeded New York water quality standards on three occasions, while total iron exceeded New York standards in October 2004 and February 2005. Total iron also exceeded Pennsylvania state standards in February 2005 (Table 51). Additional water quality analysis indicated that total manganese and total sulfate were consistently high through the sampling period, as they were last year.

Abandoned mine drainage problems exist in the headwaters of the Tioga River. The Tioga-Hammond Reservoir, located upstream of TIOG 10.8, alleviates some of the effects of abandoned mine drainage by buffering the outflow of Tioga Lake with alkaline waters stored in Hammond Lake. However, the effects of the acid mine drainage still may be observed downstream. Poor quality water from the Cowanesque River also may affect the Tioga River downstream of their confluence.

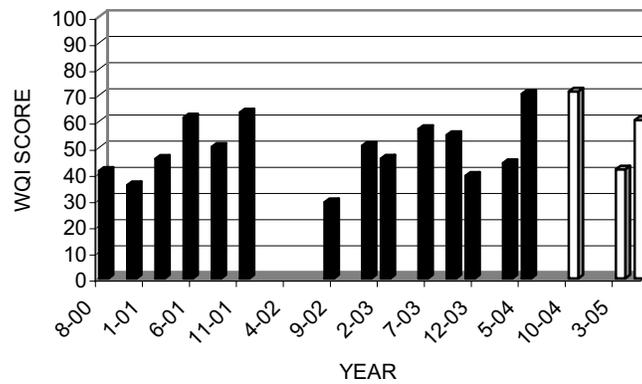
In 2001 and 2002, SRBC and Gannett Fleming, Inc. assessed the Pennsylvania portion of the Tioga River Watershed and developed a remediation strategy through the aid of a Pennsylvania Growing Greener Grant. SRBC created a report identifying acid mine drainage problem areas and prioritizing sites for treatment (Orr, 2003). This report also discusses treatment alternatives and makes predictions as to the possible treatment results.

Table 49. Water Quality Summary Susquehanna River (SUSQ 44.5) at Marietta, Pa.

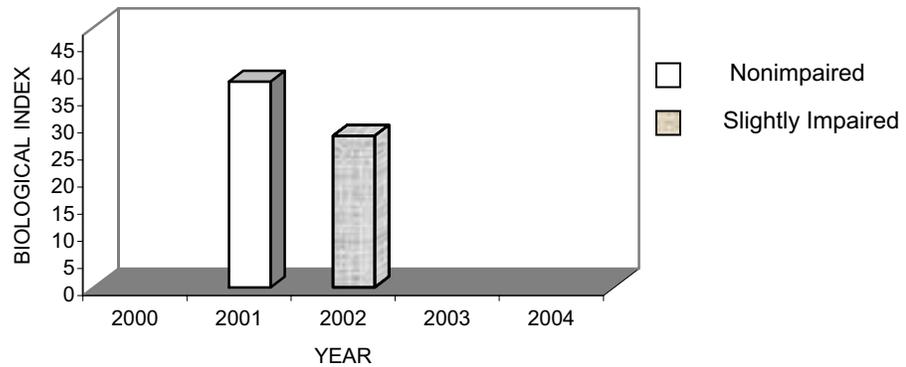
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile							
10/14/04	715	DO	TEMP	TAI	TNH3	TFe	TMn	TSO4	TOC
		TURB							
03/28/05	41.7	DO							
05/03/05	60.8	DO	COND	TFe	TS	TSO4	TOC		

Biological and Habitat Summary	
Number of Taxa	NA
Diversity Index	NA
RBP Score	NA
RBP Condition	NA
Total Habitat Score	NA
Habitat Condition Category	NA



Water Quality Index

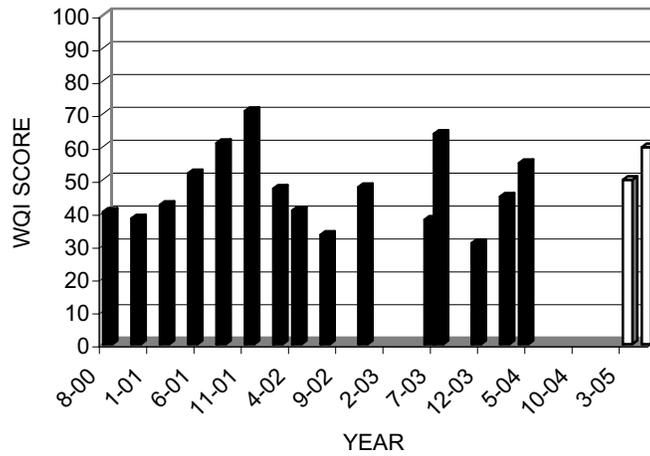


Biological Index

Table 50. Water Quality Summary Susquehanna River (SUSQ 10.0) at Conowingo, Md.

Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

Date	WQI	Parameters Exceeding 90 th Percentile							
03/28/05	49.9	DO	SS	TEMP	TAI	TSO4	TURB	TFe	
05/02/05	59.8	DO	COND	TEMP	TMn	TSO4	TURB		



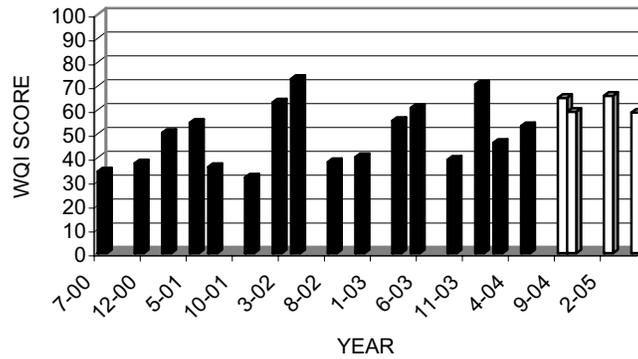
Water Quality Index

Table 51. Water Quality Summary Tioga River at Lindley, N.Y.

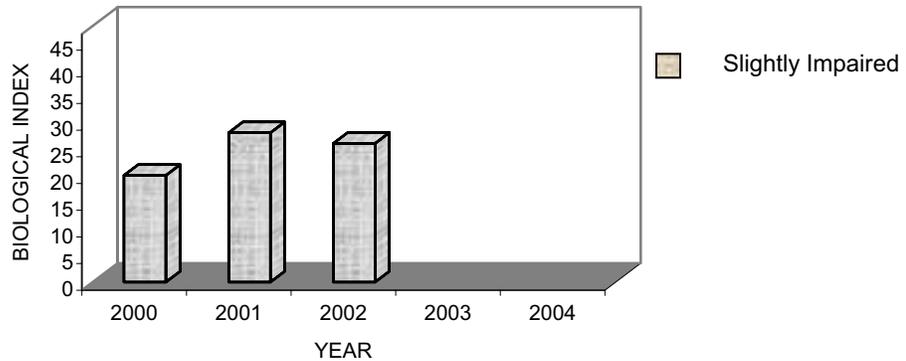
Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
TAI	09/29/04	1420 ug/l	100 ug/l	NY aquatic (chronic)
TFe	10/20/04	393 ug/l	300 ug/l	NY aquatic (chronic)
TAI	10/20/04	272 ug/l	100 ug/l	NY aquatic (chronic)
TAI	02/15/05	1670 ug/l	100 ug/l	NY aquatic (chronic)
TFe	02/15/05	1540 ug/l	300 ug/l	NY aquatic (chronic)
TFe	02/15/05	1540 ug/l	1500 ug/l	PA aquatic life

Date	WQI	Parameters Exceeding 90 th Percentile							
09/29/04	65.0	TAI	TMn	TSO4	TFe	TPO4	TURB		
10/20/04	59.2	TEMP	TMn	TSO4					
02/15/05	65.9	DO	TMn	TSO4	TOC				
05/10/05	58.9	TMn	TSO4	TURB					

Biological and Habitat Summary	
Number of Taxa	NA
Diversity Index	NA
RBP III Score	NA
RBP III Condition	NA
Total Habitat Score	NA
Habitat Condition Category	NA



Water Quality Index



Biological Index

Group 3 Sites

Babcock Run (BABC)

During May 2005, the macroinvertebrate community of Babcock Run near Cadis, PA, was designated as nonimpaired, with low metric scores for percentage of Chironomidae and percent dominant taxa. Physical habitat conditions were rated excellent, with good scores for instream cover, embeddedness, and vegetative protective cover. Staff noted that the stream was scoured from a recent high water event. All field chemistry parameters were within acceptable limits. BABC is located in a mostly forested watershed, and the stream bed is dominated by cobble substrate.

Beagle Hollow Run (BEAG)

Nonimpaired biological conditions existed at Beagle Hollow Run near Osceola, PA, during May 2005. The sample contained a large number of organic pollution-intolerant organisms and showed a high EPT Index; however, the percentage of Chironomidae was rather high. Habitat conditions were considered excellent, with a large amount of woody debris located in this forested stream and an abundance of epifaunal substrate. All field chemistry parameters were within natural ranges.

Bill Hess Creek (BILL)

Bill Hess Creek near Nelson, PA, was designated slightly impaired, with a high percentage of Ephemeroptera but a low taxonomic richness and Shannon Diversity Index. The habitat was rated supporting, with low scores given for condition of banks, velocity/depth regimes, channel alteration, and channel flow status. All field chemistry parameters were within acceptable limits. Staff noted evidence of recent high water.

Bird Creek (BIRD)

Bird Creek near Webb Mills, NY, was designated slightly impaired. This site had good scores for EPT Index and taxonomic richness but poor scores for a high percentage of Chironomidae and percent dominant taxa. The habitat was designated as supporting primarily due to poor conditions of banks and sediment deposition, which are likely the result of a high water event prior to sampling. All field chemistry parameters fell within acceptable ranges. Staff noted that nearly all of the cobble substrate was covered in algae.

Biscuit Hollow (BISC)

Nonimpaired biological conditions existed at Biscuit Hollow near Austinburg, PA, during this survey, with a high percentage of Ephemeroptera and a high EPT Index. This is the second consecutive year of nonimpaired biological conditions, which is a dramatic improvement from the moderately impaired conditions found during FY-03. The physical habitat at this site was considered supporting, with poor scores given for instream cover, velocity/depth regimes, sediment deposition, and riparian vegetative zone width. The site had slightly eroded banks and was located in an area dominated by abandoned fields and an overgrown pasture, downstream of numerous old beaver dams. Staff noted the presence of cows in the stream. Field chemistry parameters were within acceptable ranges.

Briggs Hollow Run (BRIG)

Briggs Hollow Run near Nichols, NY, was designated slightly impaired during the 2005 sampling season, with poor metric scores for EPT Index, percent dominant taxa and percent Chironomidae.

However, this site did have a very low metric score for Hilsenhoff Index, meaning there were a large number of pollution intolerant organisms in the sample. The physical habitat was designated as partially supporting and was given low scores for epifaunal substrate, instream cover, channel flow status, frequency of riffles, and riparian vegetative zone width. All field chemistry parameters were within acceptable limits. Staff noted that much of the substrate was covered with algae.

Bulkley Brook (BULK)

Bulkley Brook near Knoxville, PA, had a slightly impaired biological community and supporting habitat conditions during the 2004-2005 sampling season. The two lowest biological scores for this site were percent dominant taxa and percent Chironomidae. Habitat assessment showed low scores for channel flow status, channel alteration, conditions of banks, and sediment deposition. BULK is located in a forested area downstream of a beaver dam and did have a well developed riparian zone. Field chemistry indicated that all parameters were within acceptable limits.

Camp Brook (CAMP)

Camp Brook near Osceola, PA, had a moderately impaired biological community in May 2005, with low scores for EPT Index, Shannon Diversity Index, percent dominant taxa, and percentage of Chironomidae. The physical habitat of the stream was designated supporting; low scores were given for condition of banks, sediment deposition, velocity/depth regimes, and epifaunal substrate. All field chemistry parameters were normal.

Cook Hollow (COOK)

Cook Hollow near Austinburg, PA, had a slightly impaired biological community. This site had a high EPT Index and taxonomic richness, but scored poorly for percentage of Chironomidae and Shannon Diversity Index. The habitat was rated excellent, and field chemistry parameters were all within acceptable limits. Staff noted logging activities downstream of the sampling site.

Deep Hollow Brook (DEEP)

The biological community of Deep Hollow Brook near Danville, NY, served as the reference site for the Group 3 streams in 2005. This site had the best combination of biological, habitat, and field chemistry conditions of the Group 3 streams. DEEP had the highest Shannon Diversity Index value of all Group 3 streams, as well as high scores for taxonomic richness, EPT Index and percent Ephemeroptera. Alkalinity had exceeded the Pennsylvania aquatic life standard in previous years, but this year was at an acceptable level. Habitat at DEEP was designated as excellent, with high scores for sediment deposition, frequency of riffles, vegetative protective cover, and riparian vegetative zone width. This watershed was located in a mostly forested area, interspersed with scattered cropland and old fields, and the station was located downstream of a beaver dam. Staff noted that, at the time of sampling, the beaver dam had been breached, creating a large wetland area upstream of the sampling site.

Denton Creek (DENT)

Denton Creek near Hickory Grove, PA, had a moderately impaired biological community during May 2005. DENT was dominated by pollution tolerant Chironomidae and had poor scores for several metrics, including EPT Index, percentage of Chironomidae, taxonomic richness, Shannon Diversity Index, and percent Ephemeroptera. The habitat was rated supporting, with low scores for channel flow status, frequency of riffles, and velocity/depth regimes. Higher scores were given for riparian vegetative zone width and vegetative protective cover. The sampling site was located downstream of Hawkins Lake, and

staff noted that the stream went underground downstream of the sampling site. As in previous years, alkalinity values at DENT exceeded the water quality standards, but other field chemistry parameters were within acceptable limits in May 2005.

Dry Brook (DRYB)

Dry Brook at Waverly, NY, was not sampled in 2005 due to insufficient flow levels to take a water quality or macroinvertebrate sample.

Little Wappasening Creek (LWAP)

The biological community of Little Wappasening Creek near Nichols, NY, was designated slightly impaired in May 2005, due to low taxonomic richness and an abundance of midges. Staff noted dramatic changes at this site from previous years, including major stream channel disruption and a completely scoured stream bottom. The stream was approximately four times its normal width, and concrete and metal debris were observed in the channel. The high-cut banks with areas of erosion indicated large fluctuations in flow. The land cover is mostly forested, with some agriculture in the headwaters. The habitat was rated as partially supporting this year after being rated as excellent last year. Low scores were given for sediment deposition, channel flow status, channel alteration, velocity/flow regimes, and condition of banks. In 2001, dredging equipment was found in the stream, and timber was being removed from the streambanks. Since that time no evidence of dredging or timber removal was noted. All field chemistry parameters remained normal.

Parks Creek (PARK)

In 2003, the location of the site for Parks Creek near Litchfield, NY, was moved upstream slightly due to logging at the previous sampling site. PARK had a slightly impaired biological community during the 2005 sampling season. This site scored low for EPT Index and percentage of Chironomidae, which was the dominant taxon. The site had partially supporting habitat, with low scores for a number of parameters, including velocity/depth regimes, sediment deposition, condition of banks, and channel alteration. The predominant land use is forested, with a considerable amount of woody debris and fallen trees in the stream channel. At the time of sampling, staff noted a scoured channel, major bed movement, and eroded banks from a recent high water event. All field chemistry parameters were within acceptable ranges.

Prince Hollow Run (PRIN)

Prince Hollow Run near Cadis, PA, was designated nonimpaired in May 2005, improving from slightly impaired last year and severely impaired in 2002. This site showed high scores for taxonomic richness and percent Ephemeroptera. The habitat was rated as partially supporting, with low scores for condition of banks, sediment deposition, channel flow status, and riparian vegetative zone width. At the time of sampling, very low flow was noted, but there was evidence of channel scarring and severe bank erosion from recent high water.

Russell Run (RUSS)

Russell Run near Windham, PA, was designated slightly impaired in May 2005, as it was the previous year. Poor metric scores were given for percent dominant taxon and percent Chironomidae, which was the dominant taxon. The habitat was considered partially supporting, with low scores given for sediment deposition, channel flow status, channel alteration, and condition of banks. RUSS is located

in a primarily forested area, and staff noted large log jams and much woody debris. The substrate was covered with an abundance of algae. All field chemistry parameters were normal.

Sackett Creek (SACK)

The biological condition of Sackett Creek near Nichols, NY, was designated moderately impaired, and the physical habitat was partially supporting. SACK had the lowest taxonomic richness and Shannon Diversity Index and the highest percent of Chironomidae of all the Group 3 streams. Habitat was rated low for condition of banks, channel flow status, sediment deposition, and channel alteration. Staff noted major changes from May 2004, with the stream bottom having been bulldozed and regraded. Recent flooding left the stream bottom scoured and produced numerous new gravel bars. All field chemistry parameters were within normal ranges.

Smith Creek (SMIT)

Smith Creek near East Lawrence, PA, was designated as nonimpaired with supporting habitat. SMIT had the highest taxonomic richness of all the Group 3 streams and also had above average scores for Shannon Diversity Index, percent Ephemeroptera, and percent Chironomidae. This small stream drains a wetland area and mixed coniferous forest. Low habitat scores were given for a number of parameters, including epifaunal substrate, embeddedness, velocity/depth regimes, and frequency of riffles. Staff noted there was very low flow at this site at the time of sampling, as well as a small dump on the right bank. There were no field chemistry parameters that exceeded state limits.

Strait Creek (STRA)

A nonimpaired biological community existed at Strait Creek near Nelson, PA, during fiscal year 2005. The site had the highest percent Ephemeroptera of all the Group 3 sites and also showed good scores for EPT Index and Hilsenhoff Biotic Index. The physical habitat was designated supporting, and all field chemistry parameters were within normal limits. Low habitat scores were given for velocity/depth regimes, channel flow status, condition of banks, and sediment deposition. Staff noted very low flow at time of sampling, but there was evidence of a recent high water event.

White Branch Cowanesque River (WBCO)

In May 2004, White Branch Cowanesque River near North Fork, PA, was designated moderately impaired for the second consecutive year, with the worst metric scores for Shannon Diversity Index and Hilsenhoff Biotic Index. Additionally, it scored very low for EPT Index, percent Chironomidae, and percent dominant taxa. This site had been nonimpaired in May 2000 with a number of pollution intolerant taxa, but degraded to severely impaired by May 2003. The sample was dominated by midges, comprising 60.3 percent of the sample. The habitat was supporting due to low scores for embeddedness, velocity/depth regimes, and riparian vegetative zone width. WBCO is located downstream of an impoundment. Field chemistry measurements were within acceptable ranges.

White Hollow (WHIT)

White Hollow near Wellsburg, NY, was designated nonimpaired in fiscal year 2005 and showed the highest metric scores of all Group 3 streams for Hilsenhoff Biotic Index and percent Chironomidae. This site was dominated by the pollution intolerant mayfly, *Epeorus* (Ephemeroptera: Heptageniidae). The physical habitat was supporting, with lower scores for channel flow status, sediment deposition, and condition of banks; but high scores for riparian zone and vegetative protective cover. All water chemistry parameters were normal.