

*Note: The following is an abridged version of the 1995-96 Rotating Intensive Basin Studies (RIBS) report for the Oswego-Seneca-Oneida Rivers Drainage Basin and only contains sections of the report that pertain to the Oneida Lake watershed.*

**Rotating Intensive Basin Studies  
Water Quality Assessment Program**

**The  
Oswego-Seneca-Oneida  
Rivers Drainage Basin**

**Biennial Report  
1995-96**

New York State  
Department of Environmental Conservation  
Division of Water  
Bureau of Monitoring & Assessment

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The RIBS Sampling Program staff would like to especially recognize the contributions that RoseAnn Garry, a founding member of the RIBS team, and Maria Hanby have made to the program over the years. Much of our success over the ten year history of RIBS can be attributed to their efforts. Working with them during that time has been--both professionally and personally -- a distinct pleasure.

## **Sections of the report relevant to the Oneida Lake watershed follow:**

### **Oneida Creek in Durhamville/Verona**

Oneida Creek in Durhamville, in the Town of Verona on the Oneida-Madison County line, was sampled at the State Route 46 bridge, approximately nine miles above its confluence with Oneida Lake. This sampling site is located in a rural residential area with woodlands and fields/pastures. A few small commercial businesses line the main roads. The site is just a few miles downstream of the City of Oneida. The creek at the sampling location has been designated Class C, suitable for fishing.

In Durhamville, Oneida Creek is about 40 feet wide and generally 1-2 feet deep with some deeper pools. The median annual flow of the creek measured at the Oneida gage is 95 cfs, however, stream flow in 1995 was generally lower. The stream bottom is comprised of rocks, gravel, and sand with a small amount of silt. There are small grassy knolls located in the stream resulting in some channelized flow. Tall trees line the stream bank creating a canopy cover along the shore.

### **Overall Water Quality**

The water quality at this site has been rated as **fair** due to a slightly impacted macroinvertebrate community assessment, the presence of polynuclear aromatic hydrocarbons (PAHs) as parameters of concern in crayfish tissue, and the number of parameters of concern in the water column. Acute toxicity was also noted in one of the four samples collected at the site.

### **Macroinvertebrate Assessment**

Kick samples were collected at the site in both 1995 and 1996. In both years water quality was assessed as *slightly* impacted. Nonpoint sources and possible toxicity were indicated.

Two PAHs – phenanthrene at 160 µg/kg and pyrene at 140 µg/kg – were found in crayfish in concentrations above provisional levels of concern set for these compounds. No other heavy metal or organic parameters were elevated above background levels in organisms collected at this site.

### **Fishery Assessment**

Sampling conducted in 1996 found Oneida Creek supports a generally satisfactory warm-water fishery at the site, with an abundant and diverse community and no significant impairments. Habitat under low flow conditions is somewhat limited by wide and shallow sandy reaches. But numerous pools provide hold-over areas for larger fish. Dominant species include rockbass, yellow perch and smallmouth bass. NYS Department of Environmental Conservation currently stocks the creek with brown trout.

### **Water Column Chemistry Assessment**

Parameters of concern in the water column at the site were *iron, lead* and *dissolved solids*.

Oneida Creek in Durhamville/Verona						
Parameter of Concern	Number of Obs.	RIBS Assessment Criterion	Percent > RIBS Criterion	Max. Value	Median Value	Median-to-Criterion Ratio
Iron	15	> 300 ug/l	60	1040	420	1.4
Lead*	14	> 7 mg/l	21	16	1.7	0.2
Diss.Solids	14	> 500 mg/l	79 %	801	670	1.3
* Assessment criterion based on median hardness of 434 mg/l.						

(Regarding lead, quality control data reveal analytic limitations that may restrict the conclusiveness of the lead results. For a further discussion refer to *Lead Results*, page 104.)

### Bottom Sediment

In the bottom sediment, *copper* was found to be a parameter of concern. It was found at a level just above its assessment criteria in the sample collected in 1996. Polynuclear aromatic hydrocarbons (PAHs) were found in the sediment at fairly low, but measurable, levels.

### Toxicity Testing Assessment

Significant mortality (acute toxicity) occurred in one of the four samples collected at the sampling site. However, no significant reproductive impairment occurred in any of the four samples.

### Canaseraga Creek in East Boston/ Sullivan

Canaseraga Creek in East Boston, Town of Sullivan in Madison County, was sampled at the New Boston Road bridge. This site is located approximately eight miles above its confluence with Oneida Lake. Streamflow of the creek at sites closer to the mouth were sluggish as a result of the back water effect of the lake. This sampling site is located in a rural agricultural area with a few homes scattered between the fields and pastures. Sampling staff on occasion noted dairy cattle grazing along the creek. This portion of the creek has been designated as Class C, suitable for fishing.

At the sampling site, Canaseraga Creek is narrow (15-20 feet) and only about one foot deep. The drainage area of the site is only about 20 square miles. The stream flows over a mostly sandy streambed with rocks, gravel, and silt also present. Trees and shrubs line the stream bank.

### Overall Water Quality

The water quality at this site has been rated as **fair** due to a slightly impacted macroinvertebrate community assessment, parameters of concern in the water column and positive toxicity tests.

### Macroinvertebrate Assessment

Kick sampling of Canaseraga Creek revealed water quality to be *slightly* impacted. The East Boston site was sampled in 1995 yielded an anomalous sample that was attributed to poor habitat, and considered invalid for making a community based water quality assessment. A different site farther upstream at Sullivan was sampled in 1996, and this was assessed as slightly impacted, and similar to natural communities.

No metals or organic compounds were found to be elevated above background levels in organisms collected at this site in either 1995 or 1996.

### Fishery Assessment

Sampling conducted by regional fisheries staff found Canaseraga Creek to support a generally satisfactory fishery. Fish abundance and diversity was evaluated as appropriate with fair to good habitat. Some siltation, low velocity and rubble/gravel areas were noted as slight impairments. Dominant species include brown trout and white sucker. NYS Department of Environmental Conservation currently stocks the creek with brown trout yearlings.

### Water Column Chemistry Assessment

Parameters of concern in the water column at this site were *dissolved solids* and *iron*.

Canaseraga Creek in East Boston/Sullivan						
Parameter of Concern	Number of Obs.	RIBS Assess Criterion	Percent > RIBS Criterion	Max. Value	Median Value	Median-to-Criterion Ratio
Diss.Solids	15	> 500 mg/l	93 %	1020	794	1.6
Iron	16	> 300 µg/l	62 %	694	304	1.0

### Bottom Sediment

In the bottom sediment, *iron* was found to be a parameter of concern. It was found at a level just above its assessment criteria in the sample collected in 1995. Polynuclear aromatic hydrocarbons (PAHs) were found in the sediment at fairly low, but measurable, levels. Bottom sediments were collected at the Route 5 bridge about a mile upstream of the site in 1996 because of high flows at the sampling site.

### Toxicity Testing Assessment

Significant mortality (acute toxicity) occurred in two of the four samples, with significant reproductive impairment (chronic toxicity) occurring in the same two samples as well.

### Biological Screening Sites and Other Sampling

In addition to the Intensive Network sites, four additional sites in the Oneida River/Oneida Lake (and Minor Tribes) Watershed were included in the 1995-96 Biological Screening Network.

### Oneida River at Three Rivers

Multiplate sampling near buoy 209 in 1995 found water quality to be *slightly* impacted. Several species of mayflies and caddisflies were found at this site.

### Sconodoa Creek in Oneida Castle

Kick sampling of this tributary to Oneida Creek was conducted at the Route 365 bridge. The 1995 results indicated *slightly* impacted water quality, attributed to nonpoint sources. Siltation was also indicated as an influence on the invertebrate fauna.

**Cowaselon Creek in Canastota**

Kick sampling of this tributary to Canaseraga Creek was conducted at the Route 13 bridge. Based on 1996 sampling, water quality was assessed as *moderately* impacted. However, poor habitat is considered a probable influence on the fauna at this site.

**Canastota Creek in Canastota**

Kick samples were collected on this tributary to Cowaselon Creek in 1995 above the Main Street bridge. Based on this sampling, water quality was assessed as *slightly* impacted, with the primary influences being municipal/industrial sources and toxicity. This site was also assessed as moderately impacted during previous sampling in 1990.

**Priority Waterbody List/Other Water Quality Information**

Agricultural activities are the most frequently cited source of water quality impairment in the watershed. Nutrient loading from a number of tributaries to Oneida Lake contributes to excessive aquatic weed growth and lower dissolved oxygen in the lake. Failing on-site septic systems serving homes in some unsewered lakeshore villages are also cited as sources. These problems limit the recreational uses (swimming, boating) and fishery of the lake and some of its tributaries. Nutrient loads flowing out of the lake, as well as development of the riverfront, may also impact use support in the Oneida River.

Municipal WWTP discharges have also been noted as a source of pollutants to Sconondoa and Little Bay Creeks. CSOs are another possible source within the watershed.

<b>Priority Waterbody List Segments - Oneida River/Lake Watershed</b>				
Segment	Primary Use Impairment	Available Document.	Primary Pollutant(s)	Primary Source(s)
<b>Precluded Segments</b> None				
<b>Impaired Segments</b> Canastota Creek Oneida Creek Oneida Lake Pennellville Pond	Fishing Fish Propag. Bathing Bathing	Poor Poor Some Some	Aesthetics Silt (sediments) Nutrients Nutrients	CSOs Agriculture Agriculture Private
<b>Stressed Segments</b> Canaseraga Creek Cowaselon Creek Little Bay Creek Oneida River Sconondoa Creek	Fish Propag. Fish Propag. Fish Survival Fish Propag. Fish Propag.	Poor Some Some Poor Some	Oxygen Demand Oxygen Demand Oxygen Demand Nutrients Oxygen Demand	Agriculture Agriculture Municipal Other Surce Municipal
<b>Threatened Segment</b> Oneida Lake Trib 38	Fish Propag.	Poor	Nutrients	Agriculture

### **Fish Creek Watershed**

Fish Creek is another large tributary to Oneida Lake. This watershed drains about 530 square miles in the Tug Hill Plateau in the northeastern corner of the Oswego-Seneca-Oneida Rivers Drainage Basin. The region is largely forested and lightly populated with some agriculture to the south. Two tributaries to Fish Creek, the East and West Branches, drain most of the watershed. The East Branch originates in the East Branch Fish Creek Reservoir and drains 189 square miles. The West Branch flows out of Kasoag Lake and drains 205 square miles. The other significant Fish Creek tributary is Wood Creek. This 110 square miles watershed lies in the lowlands between Oneida Lake and Rome. It is through these lowlands that the NYS Barge Canal connects the Mohawk River to Fish Creek and Oneida Lake.

### **Biological Screening Sites and Other Sampling**

No sites in this watershed were selected for Intensive Network monitoring, but four were included in the 1995-96 Biological Screening Network.

### **Fish Creek in Vienna**

A kick sample was collected in 1995 at this site above the Oswego Road bridge. The invertebrate fauna yielded an assessment of *non-impacted*. No water quality problems were indicated.

### **Wood Creek in Seifert Corners**

Based on a 1996 kick sample collected about a mile upstream of Seifert Road, water quality was assessed as *severely* impacted. Municipal/industrial impacts were indicated. Habitat, described as being more of a run than a riffle, is a possible mitigating factor at this site. Dissolved oxygen measured at midday was only 4.5 ppm.

### **Stony Creek above Verona Mills**

A 1996 kick sample was collected below the Wehling Road bridge. Water quality at the site was assessed as *slightly* impacted. The primary factor influencing the fauna was determined to be aquatic toxicity.

### **West Branch Fish Creek in Blossvale**

Water quality was assessed as *non-impacted*, based on a 1995 kick sample collected below the McConnellsville Road bridge. The invertebrate fauna included a high number of intolerant mayflies, stoneflies, and caddisflies.

### **Priority Waterbody List/Other Water Quality Information**

The most notable water quality impairments in the Fish Creek Watershed concern Wood Creek and its tributaries. The 1996 biological monitoring clearly documents water quality impairment. Agriculture is currently listed as the primary source but urban/suburban runoff, storm sewers, industrial/manufacturing activities, landfill leachate, streambank erosion and construction/land development are also cited as contributing sources.

Priority Waterbody List Segments - Fish Creek Watershed				
Segment	Primary Use Impairment	Available Document.	Primary Pollutant(s)	Primary Source(s)
<b>Precluded Segments</b> None				
<b>Impaired Segments</b> Canada Creek	Fishing	Poor	Priority Organics	Land Disposal
<b>Stressed Segments</b> Wood Creek	Fish Survival	Poor	Silt (sediment)	Agriculture
<b>Threatened Segments</b> None				

### Chittenango Creek Watershed

Chittenango Creek is one of the larger tributaries to Oneida Lake. The creek drains an area of 288 square miles in Madison and Onondaga Counties to the south of the lake. The 40-mile long Chittenango Creek originates in Cazenovia Lake in the Appalachian Plateau and flows mostly northward through lake lowlands, entering Oneida Lake at Bridgeport. This rather diverse watershed includes significant agricultural areas, forested regions, small to medium villages such as Chittenango, Cazenovia and Manilius, and some residential suburbs of Syracuse. Limestone and Butternut Creeks drain a little more than half the watershed. Three reservoirs in the watershed – Cazenovia Lake, DeRuyter Reservoir on Limestone Creek, and Jamesville Reservoir on Butternut Creek -- have a significant impact on stream flow in the watershed.

### Chittenango Creek in Bridgeport/Sullivan

Chittenango Creek in Bridgeport, Town of Sullivan in Madison County, was sampled at the State Route 31 bridge. This sampling site is located in a rural residential community on the south shore of Oneida Lake. The site is about 3.5 miles from the creek mouth at the lake. This portion of the creek has been designated as Class C, suitable for fishing.

In Bridgeport, Chittenango Creek is wide (200-300 feet) and up to about five feet deep. The creek flows over a bed of rock, gravel, sand, silt, and clay. There is no currently (or recently) operating gage at the site, but based on the drainage area the median annual flow of the creek would likely be between 200 and 350 cfs. Grass, shrubs, and tall trees are scattered along the stream bank with a canopy cover along the shore.

### Overall Water Quality

The water quality at this site has been rated as **fair** due to a slightly impacted macroinvertebrate community assessment, of parameters of concern in the water column, and some ambient toxicity.

### Macroinvertebrate Assessment

Kick samples collected in both 1995 and again in 1996 were assessed as *slightly* impacted, although the sample approached the moderately impacted level. Macroinvertebrate species richness was very

low in both these samples. The samples suggest contributions from nonpoint sources and possible toxicity.

No heavy metals were found at or above levels of concern in the 1995 tissue samples. The 1996 sample was analyzed for organics. No organochlorine pesticides, nitrogen phosphorus pesticides, or PCBs were present above the limits of detection, and no polynuclear aromatic hydrocarbons (PAHs) were present in concentrations above the provisional levels of concern.

**Fishery Assessment**

A RIBS fishery assessment was not completed at this site for the 1995-96 sampling cycle.

**Water Column Chemistry Assessment**

Parameters of concern in the water column at this site were *lead, iron* and *dissolved solids*.

<b>Chittenango Creek in Bridgeport/Sullivan</b>						
Parameter of Concern	Number of Obs.	RIBS Assessment Criterion	Percent > RIBS Criterion	Max. Value	Median Value	Median-to-Criterion Ratio
Lead*	16	> 7 <i>ug/l</i>	31 %	36	1.1	0.2
Iron	16	> 300 <i>ug/l</i>	81 %	1220	455	1.5
Diss.Solids	15	> 500 <i>mg/l</i>	60 %	687	535	1.1
* Assessment criterion based on median hardness of 362 mg/l.						

(Regarding lead, quality control data reveal analytic limitations that may restrict the conclusiveness of the lead results. For a further discussion refer to *Lead Results*, page 104.)

**Bottom Sediment**

In the bottom sediment, *copper, iron, manganese* and *zinc* were found to be parameters of concern. Manganese was detected at a level just above its assessment criteria in the sample collected in 1995. Copper, iron and zinc were detected both years also at levels just above the assessment criteria. Polynuclear aromatic hydrocarbons (PAHs) were found in the sediment at fairly low, but measurable, levels.

**Toxicity Testing Assessment**

Significant mortality (acute toxicity) occurred in one of the four samples collected at the sampling site. However, no significant reproductive impairment occurred in any of the four samples.

**Biological Screening Sites and Other Sampling**

In addition to the Intensive Network sites, three additional sites in the Chittenango Creek Watershed were included in the 1995-96 Biological Screening Network.

**Limestone Creek in Fayetteville**

Kick samples were collected in 1996 above the Route 5 bridge. Water quality based on the macroinvertebrate community was assessed as *slightly* impacted. Nonpoint source nutrient enrichment appeared to be the most significant contributing factor.

### Butternut Creek in Jamesville

This site was sampled at the Apulia Road bridge. Non-impacted water quality was assessed for this site, based on a 1996 kick sample. The invertebrate fauna passed the field screening criteria for a non-impacted site and the sample was not retained.

### Pools Brook in Mycenae

Pools Brook was sampled in 1996 at the Route 290 bridge. This was a moss-dominated headwater site, and resulted in anomalous community indices. An overall assessment of *non-impacted* water quality was based on the similarity of the kick sample to other invertebrate communities with similar habitat conditions. The fauna was heavily dominated by scuds, and the indices were not considered representative of actual water quality.

### Priority Waterbody List/Other Water Quality Information

Primary pollutants in the Chittenango Creek Watershed are considered to be nutrients and siltation/sediments. These substances limit the fishery by decreasing oxygen levels and filling in the stream beds, causing fish propagation to be restricted. Excessive nutrient loads also promote the growth of aquatic vegetation that discourages recreational uses (swimming, boating) in the watershed. A number of sources have been identified and/or suggested. These include agricultural activities, streambank erosion, gravel mining, construction/land development, urban runoff, and failing septic systems serving lakeside residences.

Priority Waterbody List Segments - Chittenango Creek Watershed				
Segment	Primary Use Impairment	Available Document.	Primary Pollutant(s)	Primary Source(s)
<b>Precluded Segments</b> Chittenango Creek	Fish Propag.	Poor	Nutrients	Agriculture
<b>Impaired Segments</b> Jamesville Reservoir Limestone Creek	Bathing Fish Propag.	Some Some	Silt (sediments) Silt (sediments)	Agriculture Res. Extraction
<b>Stressed Segments</b> Cazenovia Lake Meadow Brook	Bathing Aesthetics	Some Poor	Nutrients Salts	On-site Systems Urban Runoff
<b>Threatened Segments</b> Butternut Creek & Trib Chittenango Creek Pools Brook Pools Brook Trib	Fish Propag. Fish Propag. Fish Propag. Fish Propag.	Poor Poor Poor Poor	Nutrients Silt (sediments) Silt (sediments) Nutrients	Agriculture Construction Construction Agriculture