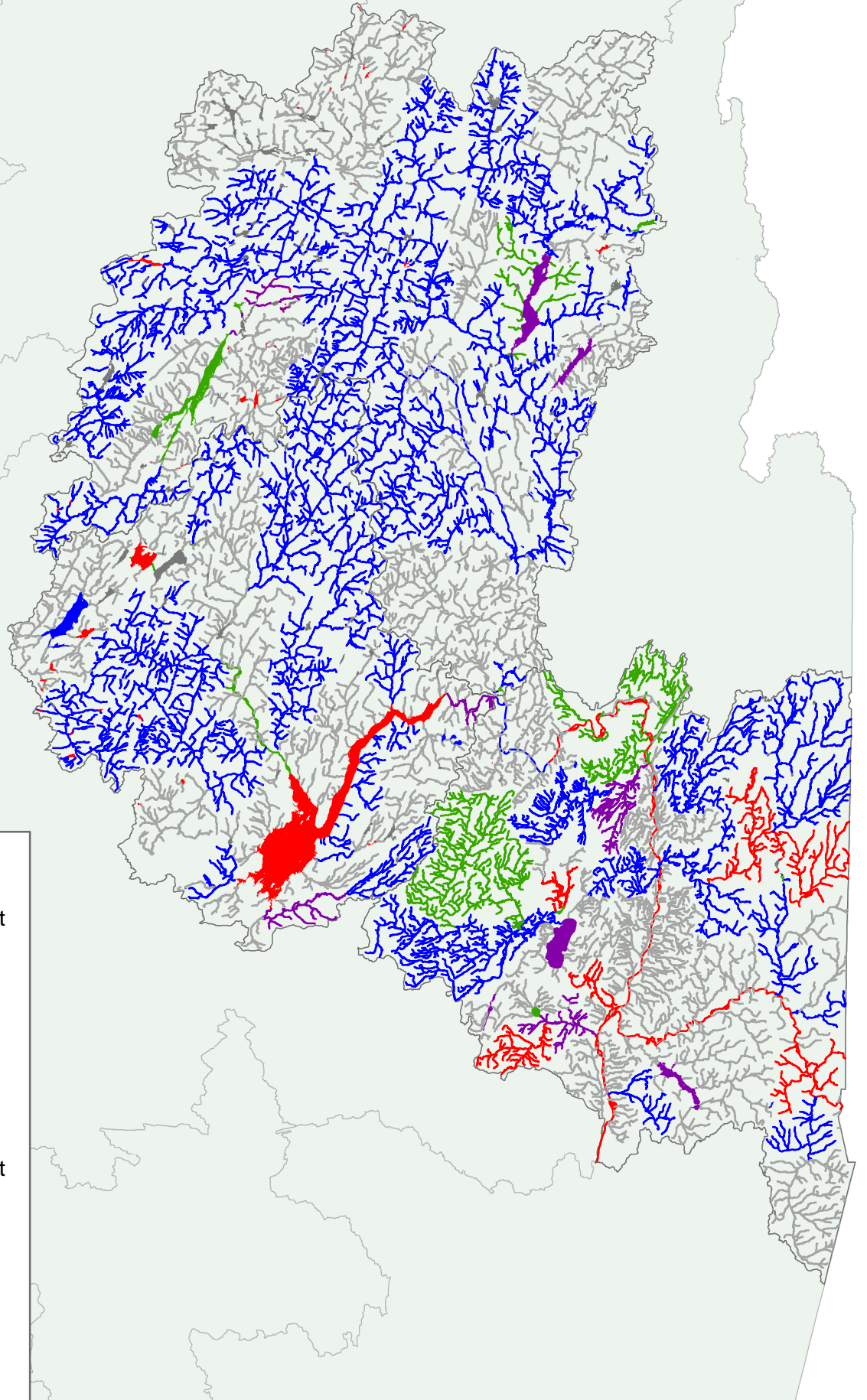
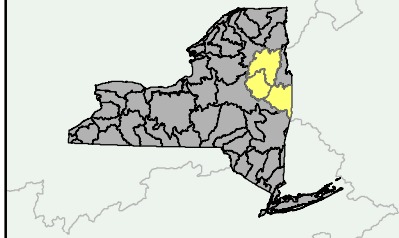


Upper Hudson River Basin

2003 WI/PWL Water Quality Assessment



- Assessment**
- Lake/Reservoir
 - Impaired Segment
 - Minor Impacts
 - Need Verification
 - No Known Impact
 - UnAssessed

- River/Stream**
- Impaired Segment
 - Minor Impacts
 - Need Verification
 - UnAssessed
 - No Known Impact

0 3.5 7 14 Miles

The Upper Hudson River Basin

Basin Description

The Upper Hudson River Basin is comprised of the drainage area tributary to the Hudson River above its confluence with the Mohawk River at the Troy Dam. This drainage includes much of the middle portion of eastern New York State, as well as a part of southwestern Vermont and a small part of northeastern Massachusetts. The basin is quite diverse, draining the sparsely populated rugged mountains and woodlands of the southeastern Adirondacks as well as the more densely populated urban-suburban Capital District area along the Albany-Troy-Saratoga corridor. The Upper Hudson Basin represents about one-third of the Hudson/Mohawk River drainage area – one of the largest river basins in the eastern United States.

Approximately 4,070 of the 4,620 square mile Upper Hudson Basin falls within New York State. The basin includes most of Saratoga, Washington and Warren Counties, large parts of Essex and Hamilton Counties, and smaller sections of Fulton and Rensselaer Counties.

The majority of the Upper Hudson River Basin is sparsely populated forest and woodland, with much of the drainage area falling within the boundary of the Adirondack Park. The rugged upper or northern and western portions of the basin are largely natural preserved areas well regarded for fishing, boating and other outdoor recreational activities. Most of the Upper Hudson Basin population of about 293,480 (2000) live in the lower half of the drainage area, along the Hudson River and Adirondack Northway (I-87) between the Albany-Troy, Saratoga and Glens Falls corridor. The largest population centers located entirely or in part in the basin are the cities of Troy (49,170), Saratoga Springs (26,186), Gloversville (15,413) and Glens Falls (14,354), and the surrounding suburban towns of Clifton Park (32,993) and Queensbury (25,441). Outside these urban and suburban centers, the basin also has significant rural agricultural areas, particularly in Washington and Rensselaer Counties to the east of the Hudson.

There are about 7,140 miles of rivers and streams (and canal) and over 700 lakes and ponds in the basin. Many of the ponds are too small to be individually assessed, but 219 significant* lake, pond and reservoir waterbody segments (covering 76,940 acres) are included in the Upper Hudson Basin Waterbody Inventory. The lower 80 miles of the main stem of the Upper Hudson River is wide and deep enough to support larger recreational boats. The largest tributaries to the Upper Hudson include the Sacandaga River with about 1,740 miles of streams or 24 percent of the basin total, Schroon River (822 miles, 12%), Fish Creek (551 miles, 8%), Hoosic River (533 miles, 7%) and Batten Kill (334 miles, 5%). Of the lakes/reservoirs, the largest are Great Sacandaga Lake (26,800 acres, or 35 percent of lake waterbody acres in the basin), Indian Lake (4,465 acres, 6%), Schroon Lake (4,130 acres, 5%) and Saratoga Lake (4,030 acres, 5%).

Water Quality Issues and Problems

Water quality in much of the Upper Hudson River Basin is good to excellent. Over 80 percent of assessed river and stream miles in the basin fully support designated uses. Given the light population and large tracts of forest and state parkland, this is not surprising. Impacts from human activities within the basin are limited and generally localized. However, the basin does experience significant water quality impacts that are the results of past historic activities and pollutant sources from outside the boundaries of the basin. These impacts include PCB contamination of sediments in the Upper Hudson, acid rain and atmospheric deposition of mercury. These impairments restrict fishing and fish consumption in many waters of the basin, including nearly half of its lake acres.

* *Significant Lakes* are lakes of 6.4 acres (0.01 square miles) or larger and are included in the New York State Lakes Gazetteer.

PCBs in the Upper Hudson

Fish consumption in the Upper Hudson River is impaired due to a NYSDOH health advisory that recommends eating no fish (all species) because of elevated PCB levels. The sources of PCBs are attributed to historic industrial discharges. From approximately 1947 to 1977, the General Electric Company (GE) discharged as much as 1.3 million pounds of polychlorinated biphenyls (PCBs) from its capacitor manufacturing plants at the Hudson Falls and Fort Edward facilities into the Hudson River. In 1976, because of the concern over the bioaccumulation of PCBs in fish and other aquatic organisms and their subsequent consumption by people, the State of New York banned fishing in the Upper Hudson River and commercial fishing of striped bass, and several other species, in the Lower Hudson. In August 1995, the Upper Hudson was reopened to fishing, but only on a catch and release basis.

The approximately 200-mile stretch of the Hudson River from Hudson Falls to the Battery in New York City has since been declared a Federal Superfund site. The Upper Hudson River, an approximately 40 mile reach of the river from Hudson Falls to Troy, in Washington, Saratoga and Rensselaer Counties, is the major focus of the investigations, and is the reach that is being targeted for remediation. Previous studies identified 40 hot spots in the Upper Hudson, defined as sediments contaminated with greater than 50 parts per million (ppm) of PCBs. Also included in the site are five remnant deposits, which are river sediments that were exposed when the level of the river was lowered due to the removal of the Fort Edward Dam in 1973.

This site is being addressed through a combination of federal and potential responsible party actions. EPA is the lead agency for cleanup of the Hudson River PCBs Superfund site. The New York State Department of Environmental Conservation (NYSDEC) is the support agency for this project. The United States Department of Interior (Fish and Wildlife Service) and the United States Department of Commerce (National Oceanic and Atmospheric Administration) are also involved as federal trustees of natural resources. The February 2002 Record of Decision (ROD) calls for targeted environmental dredging and removal of approximately 2.65 million cubic yards of PCB-contaminated sediment from a 40-mile stretch of the Upper Hudson. In the ROD, EPA selected a plan that addresses the risks to people and the environment associated with PCBs in the sediments of the Upper Hudson River. More information regarding the remediation effort can be found on the EPA website at: www.epa.gov/hudson.

Atmospheric Deposition of Mercury

Mercury is a toxin that rapidly bioaccumulates up the food chain and can concentrate in large predatory fish. This is particularly true in acidic waters. While mercury has been largely removed from most wastewater and industrial effluents, air emissions and the resulting atmospheric deposition of mercury on the land and into the waters remain a significant source. New York State has issued health advisories limiting the consumption of various species of sportfish for about a dozen specific waterbodies in the Upper Hudson Basin, including the largest lake: Great Sacandaga Lake. A general advisory limiting consumption of sportfish from all waters of the state is in place due to the common occurrence of some chemicals (including mercury) in fish and the inability to test all waters. Additional and more restrictive advisories are in place for women and children regarding the consumption of fish from waters of the Adirondacks and Catskills because of the likelihood of atmospheric deposition of mercury to acidic waters in these areas.

Acid Rain

Low pH attributed to atmospheric deposition/acid precipitation has been documented in many small lakes and ponds in the basin. Such conditions are known to have a significant impact on ecosystems, impairing fish and aquatic life support in some lakes and ponds. Efforts are underway on a national level to address problems caused by acid rain by reducing pollutant emissions, as required by the Clean Air Act. New York State (and other northeastern states) have taken legal action against USEPA to accelerate implementation of controls. Monitoring of these waters will continue, in order to assess changes in water quality resulting from

implementation of the Clean Air Act. However, these changes are expected to occur only slowly over time.

In 2006 NYSDEC established and USEPA approved a Total Maximum Daily Load (TMDL) plan to address acid rain impairment to 143 Adirondack lakes that are located in NYS Forest Preserve lands, including some in the Upper Hudson Basin. Recognizing that the available pH data for many of these lakes is 20-30 years old, the TMDL outlines a phased/adaptive management approach. That approach initially relies heavily on monitoring and assessment to determine current conditions, followed by modeling refinements to estimate future conditions, and finally the implementation of statewide, regional and national efforts to reduce atmospheric loadings causing the impairment.

Previous Priority Waterbodies Lists included a significant number of small lakes impacted by acid rain/atmospheric deposition. However, with the expansion of the WI/PWL database to accommodate all waterbodies, it was necessary to limit individual listing of smaller lakes. Although these lakes and ponds are no longer listed separately, and the sum total lake area affected is not that large a percentage of the total lake area in the basin, acid rain/atmospheric deposition remains a significant water quality issue affecting a large number of waterbodies in the Upper Hudson Basin.

Fish Consumption Advisories

Fish consumption advisories in the Upper Hudson Basin are the result of the water quality problems noted and discussed above. Specifically, in the lower 40 miles of the Upper Hudson River people are advised to eat no fish due to PCB contamination. Advisories are also in place recommending that the consumption of some fish species from about a dozen lakes in the basin be limited due to mercury contamination.

CSOs and Urban/Suburban Development

Various recreational uses, aquatic life support and aesthetics in waterbodies in and around some villages and other urban areas of the basin experience impacts from combined sewer overflows (CSOs), wet-weather runoff from impervious urban centers and/or inadequate domestic wastewater treatment. These sources contribute pathogens, nutrients and sediment to the waters. Increasing development in more suburban and rural areas can also impact water quality. Development around some of the lakes in the basin – and the resulting increase in nutrient and sediment loads – is a particular concern.

Invasive Aquatics

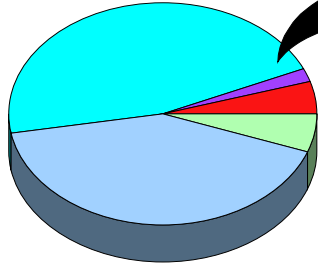
Invasive aquatic weeds and excessive algal growth is an increasing issue in a number of basin lakes. Eurasian water milfoil is the most commonly cited invasive species. A number of lake associations conduct various weed management programs in support of summer recreational uses.

Groundwater Resources

Although groundwater resources are not specifically tracked through the WI/PWL, they are considered *Priority Waters* nonetheless. Groundwater provides drinking water for about one-third of the population of New York State and is the source of base flow for most rivers and streams in the state. Management and protection of both the quantity and quality of this resource is critical for protecting public health, and is also a key element of surface water quality and wetland management efforts. In the Upper Hudson River Basin, the more significant threats to groundwater resources include inactive hazardous waste sites, pesticide application, animal feeding operations, on-site wastewater treatment systems, and contaminant spills.

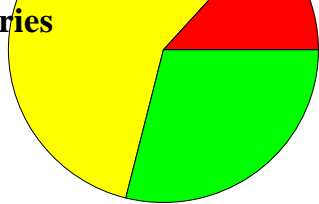
Rivers/Streams

Water Quality Assessment Categories (for ALL Water in the Basin)



- PWL - Not Supporting Uses
- PWL - Other Minor Impacts
- No Known Impacts
- UnAssessed Waters
- Impacts Needing Verification

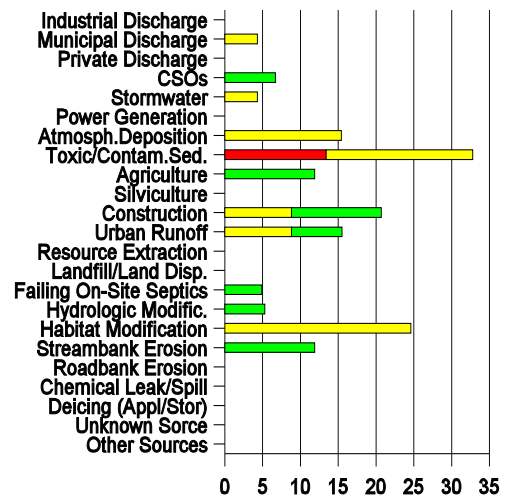
Severity of Problems (PWL Segments Only)



- Precluded
- Stressed
- Impaired
- Threatened

Upper Hudson Basin
 Total River Miles: 7138
 Total PWL Miles: 496

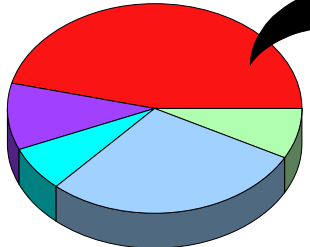
Major Sources of Impact (PWL Segments Only)



Percent of PWL Waters Affected

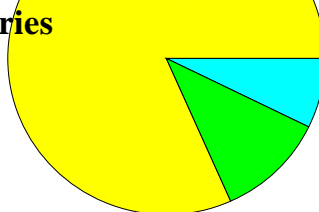
Lakes/Reservoirs

Water Quality Assessment Categories (for ALL Water in the Basin)



- PWL - Not Supporting Uses
- PWL - Other Minor Impacts
- No Known Impacts
- UnAssessed Waters
- Impacts Needing Verification

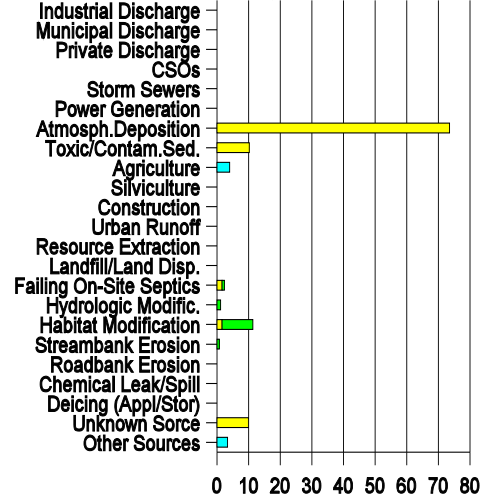
Severity of Problems (PWL Segments Only)



- Precluded
- Stressed
- Impaired
- Threatened

Upper Hudson Basin
 Total Lake Acres: 76,936
 Total PWL Acres: 43,462

Major Sources of Impact (PWL Segments Only)



Percent of PWL Waters Affected

Basin Water Quality Summary

Only about seven percent (7%) of the 7,138 river miles in the Upper Hudson Basin (496 miles) are listed on the Priority Waterbodies List as either not supporting uses or having minor impacts or threats to water quality. About one-fourth of these PWL river miles are considered *Stressed* or *Threatened* waters that fully support appropriate uses, but that have minor impacts/threats. About five percent (5%) of basin river miles are *Precluded* or *Impaired* and do not support appropriate uses.

There are 26 separate lake segments included on the PWL as *Precluded* or *Impaired* (and not supporting uses) or *Stressed* or *Threatened* (but that do support uses). Altogether these PWL lakes represent 54 percent of the total lake acres in the basin. Half of the lakes listed as not supporting uses are listed as a result of fish consumption advisories, primarily due to atmospheric deposition of mercury. These mercury contaminated

lakes comprise almost 80 percent of the lake acres with impairment/impacts.

Significant sources of impact and impairment to the waters of the basin include atmospheric deposition (cited as a source in 75 percent of PWL lake acres) and toxic/contaminated sediments (cited in one-third of PWL river miles). Habitat modification, including invasive species impacts, construction/development activities and urban runoff, are also frequently cited sources of impact to PWL waters.