

The Ramapo/Hackensack River Basin

Basin Description

The Ramapo and Hackensack River are part of the Passaic River Basin which is located primarily in northeastern New Jersey. However the northern headwaters of the basin lie within a small portion of southeastern New York State. The Hackensack River, Saddle River, Ramapo River and Wanaque River/Greenwood Lake are the primary tributary waters that make up the New York portion of the basin. The entire Passaic River Basin covers about 935 square miles before emptying into Newark Bay and then New York Harbor/Atlantic Ocean. Within New York state Passaic tributaries drain about 211 square miles in the southern Hudson River Highlands. The basin includes much of Rockland County and a small corner of Orange County.

Although the Ramapo/Hackensack River Basin is the smallest in New York State in area, it is also one of the most densely populated. The total population of the basin is 249,035 (2000), or about 1180 persons per square mile. Urban/suburban areas (New City, Spring Valley, Suffern, Nanuet) dominate the eastern (Hackensack) half of the watershed. In the western half of the basin the population is more scattered among larger tracts of forest and woodland.

There are about 320 miles of rivers and streams the basin and 80-90 lakes and ponds. Many of the ponds are too small to be individually assessed, but 35 significant* lake, pond and reservoir waterbody segments (covering 5162 acres) are included in the Ramapo/Hackensack River Basin Waterbody Inventory. The two largest tributaries – the Ramapo and Hackensack Rivers – account for 155 miles (or 47%) and 74 miles (23%) of river/stream miles in the basin, respectively. The largest lakes in the basin are Greenwood Lake (1,075 acres in New York State) and DeForest Lake (720 acres).

Water Quality Issues and Problems

Water quality impacts in the New York State portion of the Ramapo/Hackensack River Drainage Basin are primarily the result of extensive urbanization and suburban/commercial development in the eastern, Rockland County half of the drainage area. Urban/stormwater runoff is the dominant source of water quality impacts. Municipal discharges are a second source of nutrient and other pollutant loadings; not surprising given the heavy population of the basin. In areas not served by municipal wastewater facilities, failing and/or inadequate on-site septic systems are a concern. Industrial and past hazardous waste site disposal are also noted as the source of some water quality impacts in the basin.

In addition to addressing existing sources and restoring impacted waters, there is also widespread interest and support for protecting the highly valued water resources of the Ramapo/Hackensack River Basin. Of particular concern is the protection of drinking water resources. The larger tributaries in the basin – Hackensack, Ramapo and Mahwah Rivers – are Class A waters designated for use as water supplies. In addition to the water supply use of these waters in New York State, most all of the waters in the basin feed into significant water supply systems in New Jersey.

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

Urban/Industrial/CSO Runoff

Various recreational uses, aquatic life use support, and aesthetics in stretches of the urban/suburban waterways throughout the basin are significantly restricted by pollutants from various industrial, municipal, and commercial sources. The most significantly affected of these waterbodies are located in the highly developed New York City suburbs of Rockland County. Urban storm runoff transports a variety of pollutants and debris into the waterways. Contaminated sediments, inactive hazardous waste sites and other impacts attributed to past/historic discharges also limit waterbody uses.

Commercial Development/Suburban Sprawl

Impacts on water supply resources, aquatic life and other uses due to increasing commercial and suburban residential development is of particular concern in the Ramapo/Hackensack River Basin. Such development and the accompanying expansion of impervious surfaces results in more nonpoint runoff and increasing loadings of silt, nutrients and chlorides. Additional residential growth and accompanying wastewater impacts – be they individual on-site systems, cluster systems or smaller municipal facilities – also contribute to increased pollutant loadings.

Lake Eutrophication and Recreational Use Impacts

Eutrophication is a natural process that occurs as a lake ages and is not necessarily indicative of man-made pollution. However when human activities (e.g., shoreline erosion, urban/agricultural runoff, wastewater discharges or septic seepage) accelerate this process, it is known as cultural eutrophication. Such accelerated changes can alter plant and animal life within the lake, shoreline and surrounding watershed, and decrease the water quality and recreational value of a lake. The population growth and preponderance of small lakes in the Ramapo/Hackensack River Basin result in the frequent occurrence of such impacts on recreational uses of basin lakes.

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. Ground water resources are particularly at risk in the Ramapo/Hackensack River Basin where large populations – in both New York and New Jersey – rely on wells for drinking water supply. In the basin, the more significant threats to groundwater resources include urban/stormwater runoff, inactive hazardous waste sites, chemical spills, deep-well injection and failing/inadequate on-site wastewater treatment systems.

Ramapo/Hackensack River Basin Water Quality Assessment

The series of charts presented on the following pages provides an overall assessment of water quality conditions in the entire Ramapo/Hackensack River Basin. For each waterbody type (rivers/streams and lakes/reservoirs) the first chart shows the percentage of the miles/acres of waters in the basin that fall into the various water quality assessment categories. The **red** portion of the first pie indicates the percentage of waters characterized as *Not Supporting Uses*. The **purple** portion represents segments with *Minor Impacts/Threats*. Taken together, these categories of waters comprise the *Priority Waterbodies* for that waterbody type. The percentage of miles/acres for the other water quality assessment categories – waterbodies having *No Known Impacts*, *UnAssessed Waters*, and waterbodies with *Impacts Needing Verification* – are shown in **blue**, **light blue**, and **green** respectively.

The second pie chart shows the severity of the most significant use impact or restriction for waters in the two categories that comprise the Priority Waterbodies. The levels of severity are:

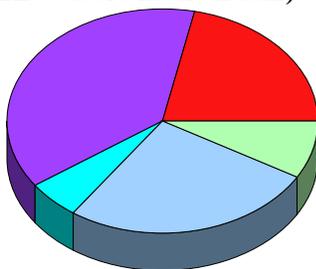
- Precluded:* waters do not support appropriate uses;
- Impaired:* waters frequently do not support appropriate uses;
- Stressed:* waters support appropriate uses, but other water quality impacts are apparent; and
- Threatened:* waters support uses and have no impacts, but activities threaten future use support.

More detailed descriptions of these levels of severity are outlined in *Appendix A - Assessment Methodology*.

The bar charts indicate the pollutant sources that are most frequently cited as major contributors to the water quality impacts for Priority Waterbodies in the Ramapo/Hackensack River Basin. The charts reflect the percentage of miles/acres of the total waterbody area on the Priority Waterbodies List where a particular source is listed as a major contributor to the water quality impact. For each source, the color shading of the bar indicates the severity level (*Precluded, Impaired, Stressed, Threatened*) of the most significant water use impact to the waterbody.

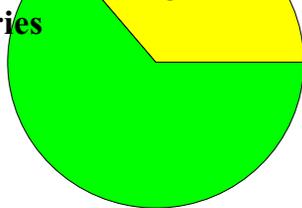
Rivers/Streams

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



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

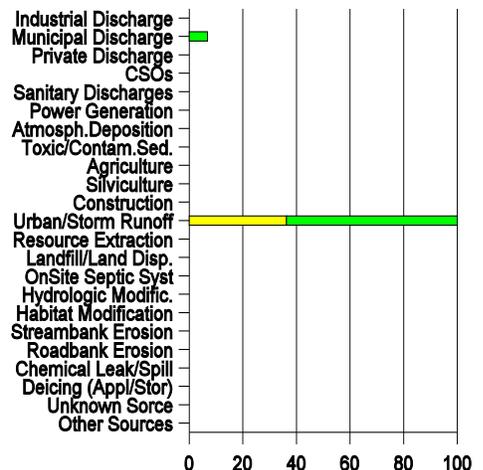
Severity of Problems
(PWL Segments Only)



- Precluded
- Impaired
- Stressed
- Threatened

Ramapo/Hackensack Basin	
Total River Miles:	320
Total PWL Miles:	191

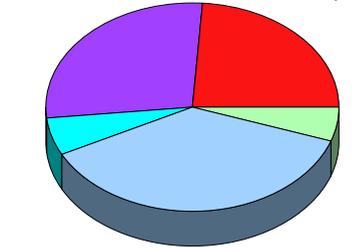
Major Sources of Impact
(PWL Segments Only)



Percent of PWL Waters Affected

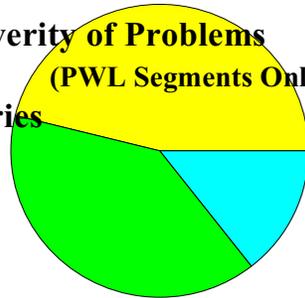
Lakes/Reservoirs

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



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

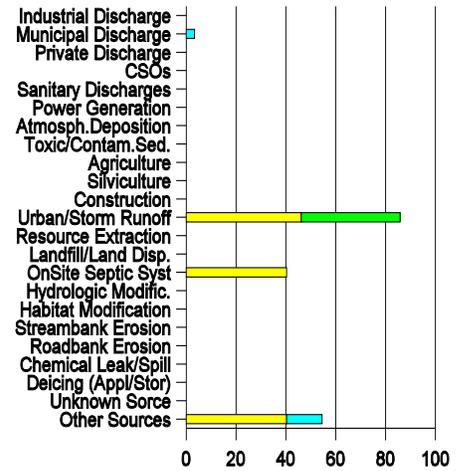
Severity of Problems (PWL Segments Only)



- Precluded
- Impaired
- Stressed
- Threatened

Ramapo/Hackensack Basin	
Total Lake Acres:	5,162
Total PWL Acres:	2,667

Major Sources of Impact (PWL Segments Only)



Percent of PWL Waters Affected

Basin Water Quality Summary

About sixty percent (60%, or 191 miles) of the 320 river miles in the Ramapo/Hackensack River Basin are included on the Priority Waterbodies List as either not supporting uses or having minor impacts or threats to water quality. Nearly two-thirds (63%) of these Priority Waterbody Listed river miles are considered *Stressed* or *Threatened* waters that fully support appropriate uses, but that have minor impacts/threats to uses. However nearly twenty-two percent (22%) of all river miles in this highly urbanized basin are *Impaired* and do not fully support appropriate uses.

Six of the 35 separate lake segments in the basin are included on the PWL as having either impaired uses or minor impacts/threats to uses. However these six impaired/impacted lakes include the three largest lake waterbodies and represent over half (52%) of the total lake acres in the basin. Two of these lakes (totaling 1,233 acres, or 24% of basin lake acres) experience water quality impacts that result in uses not being fully supported.

The most frequently cited source affecting water quality in this highly developed basin is urban/stormwater runoff. Failing and/or inadequate on-site septic systems are also noted as a significant contributing source; however this source is cited for just one waterbody (Greenwood Lake, the largest lake in the basin). “Other Sources” are also frequently cited as contributing to impacts/threats. These other sources include in-lake nutrient recycling (Greenwood Lake) and unspecified other sources that represent possible future threats to drinking water supplies.

Insert Figure 2 - Basin Water Quality Assessment Map

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The Ramapo/Hackensack River Basin Waterbody Inventory/Priority Waterbodies List

This compilation of water quality information includes individual waterbody *Data Sheets* describing the water quality conditions in the Ramapo/Hackensack River Basin of New York State. Causes (pollutants) and sources of water quality problems for those waterbodies with known or suspected impacts are also outlined.

The data sheets are presented in hydrologic order, beginning with the most downstream waters and continuing upstream through the basin. Waterbody data sheets are grouped by US Geological Survey Hydrologic Unit Code (HUC) basin and presented as separate sections of this report (see Figure 3). A Waterbody Inventory of the specific waterbody segments in each watershed is included at the beginning of each watershed section.

Data sheets are included for each waterbody that has been assessed; i.e., waterbodies listed as *Impaired Waters* (Not Supporting Uses), Waters with *Minor Impacts*, *Threatened Waters*, waters with water quality impacts ***Need Verification***, or waterbodies with *No Known Impact*. *UnAssessed* waterbodies are included in the Waterbody Inventory for each watershed, but because they have not been assessed data sheets for these waters have not been included.

The information outlined on the data sheets includes *Waterbody Location Information*, *Water Quality Problem/Issue Information*, *Resolution/Management Information* and *Further Details*. See *Appendix B – Waterbody Inventory Data Sheet Background Information* for more details about the data sheets.

Note that the assessments in this report reflect the best available water quality information at the time of publication. Water quality information may be added or modified subsequent to the preparation of this edition of the Waterbody Inventory and Priority Waterbodies List. When information is updated, the data sheet for the corresponding waterbody segment is issued with the date of revision. More recently revised data sheets supercede the corresponding waterbody information in this listing.

Following the individual waterbody data sheets in the watershed sections, a *Summary Listing of Priority Waters* provides a brief overview of all *Priority Waterbodies*, i.e., waterbodies listed as *Impaired Waters* (Not Supporting Uses), Waters with *Minor Impacts* and *Threatened Waters*.

Indices of waterbody data sheets by both county and alphabetically by segment name are included as Appendix C and D, respectively.