

1.7 Surface Water Resources

Surface water is all water whose surface is exposed to the atmosphere. The surface water system is made up of rivers, streams, lakes, ponds, canals, reservoirs, swamps, marshes and the ocean.

Water bodies serve as a kind of circulatory system providing nutrients and metabolizing waste materials. Wildlife and the aquatic community relies on waterways for these functions, as well as shelter and a place to rest and breed. Humans enjoy the added benefits of recreation, transportation and socio-economic opportunities.

The uppermost reach of a stream is called its headwaters. Streams in a watershed can be classified according to stream “order.” A small, unbranched stream, typically a headwaters stream, is a first-order stream. When two first-order streams join, they form a second-order stream. A third-order stream has tributaries that are first and second-order streams. The stream “order number” can be useful for classifying and characterizing streams and rivers for consideration of management options, and is discussed further in Section 8.1 of this report. Streams also can be classified as “gaining” or “losing.” A gaining stream accumulates water as it flows to lower elevations. Water seeps into a gaining stream from its banks and channel bottom. A losing stream loses water as it flows to lower elevations. Water seeps out of the sides and bottom of a losing stream and into its banks.

The US Geological Survey (USGS) operates and maintains four (4) stream flow monitoring stations in WMA 4 that maintain historical flow data (some of which perform water quality sampling). Table 1.7.1 provides historical flow data at these gaging stations. It must be noted that the flow past the above stations can be affected by pumpage from wells, storage at reservoirs and gate operations at dams upstream of each site.

Each watershed is subdivided into smaller watersheds using a grouping called the Hydrologic Unit Code (HUC), which uses a series of numbers to describe the relationship of each smaller watershed to the other watersheds with which it is associated. Using the 11-digit HUC for WMA 4, the subwatersheds are as follows (note that only the last three digits vary within WMA 4):

- Passaic River Lower Basin (Saddle River to Pompton River)(02030103120)
- Passaic River Lower Basin (Saddle River to Newark Bay)(02030103150)
- Saddle River Basin (02030103140)

Passaic River Lower Basin (Saddle River to Pompton River)(02030103120) –

Within the basin, the Passaic River begins at the confluence with the Pompton River (Wayne Township) and travels north and then sharply south, a total of approximately 17 miles, where the Passaic River and Saddle River join together. This basin is 83 square miles in area and is located in the western and central portion of WMA 4. This subwatershed is further divided into 10 HUC-14 subwatersheds that are indicated on

Plate 1.1.2. A summary of stream information in this river basin is as follows (obtained from available NJDEP GIS datasets):

ORDER	STREAM MILES	%
1	66.46019299	52.10%
2	27.46948693	21.53%
3	9.476076136	7.43%
4	5.749947159	4.51%
5	0.083663068	0.07%
6	18.33155947	14.37%
TOTAL	127.5709258	100.00%

From the NJDEP GIS datasets, there are 84 artificial lakes covering 442 acres, and 8 natural lakes covering 17 acres. The Haledon Reservoir is an artificial lake in WMA 4 that was previously used for potable water supply to the Borough of Haledon. The Cedar Grove Reservoir is an open, finished water reservoir that stores potable water for the City of Newark. The Cedar Grove Reservoir is an off-stream storage facility and does not collect watershed runoff, instead water is delivered to the reservoir from Newark's Pequannock Water Treatment Plant. The Passaic Valley Water Commission (PVWC) diverts flow from the Passaic River upstream of Little Falls for treatment in its Little Falls facilities.

Passaic River Lower Basin (Saddle River to Newark Bay)(02030103150) –

Within this basin, the Passaic River begins at the confluence with the Saddle River and travels south approximately 14 miles to the Newark Bay. This river basin is 54 square miles in area and is located in the southern portion of WMA 4. This subwatershed is further divided into 5 HUC-14 subwatersheds that are indicated on Plate 1.1.2. A summary of stream information in this river basin is as follows:

ORDER	STREAM MILES	%
1	26.54422405	44.84%
2	7.367514583	12.45%
3	10.09241875	17.05%
6	15.19154186	25.66%
	59.19569924	100.00%

From the NJDEP GIS datasets, there are 52 artificial lakes covering 147 acres, and 5 natural lakes covering 3 acres. The lakes are primarily for recreational use, and there are no artificial lakes or reservoirs that contribute to potable water supply functions.

Saddle River Basin (02030103140) - The Saddle River's headwaters originate in the Town of Ramapo, New York and the river travels south approximately 18 miles and joins the Passaic River at Wallington Borough. The Saddle River Basin is 59 square miles in area and is located in the northern and eastern portions of WMA 4. This

subwatershed is further divided into 7 HUC-14 subwatersheds that are indicated on Plate 1.1.2. A summary of stream information in the Saddle River Basin is as follows (obtained from available NJDEP GIS datasets):

ORDER	STREAM MILES	%
1	55.14753788	51.67%
2	21.88946515	20.51%
3	16.72360455	15.67%
4	12.96581515	12.15%
TOTAL	106.7264227	100.00%

From the NJDEP GIS datasets, there are 99 artificial lakes covering 213 acres. The inventory does not indicate any natural lakes, but does not include water bodies within the State of New York (not available). A review of USGS mapping indicates the presence of approximately one dozen small lakes in New York on the headwaters of the Saddle River.

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