WRAP

Whippany River Action Plan

Group 3

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UAPP411: Regional Watershed Management

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Mission Statement

WRAP aims to improve the health of the Whippany River by understanding and targeting sources of fecal coliform, mitigating erosion, and improving the health of the riparian zone. Located in Morris County, New Jersey, the Whippany River's proximity to urbanized areas presents unique challenges. By working off of reports and framework established by the Whippany River Watershed Action Committee (WRWAC), and utilizing a $1.5 million grant pledged to the watershed as of January, 2023, we hope to realize our goals by 2030.

Background

The Whippany River runs approximately 19 miles, its headwaters rising quietly in Mendham Township. A tributary of the Rockaway River, and part of the Passaic River Basin, the Whippany River drains an area of 69.3 square miles. The river is named after the Whippanong Indians, Whippanong meaning "place of the willows."

The Whippany is used primarily for recreation, specifically fishing views, and walking trails along Patriot's Path. For this reason, community involvement must drive the push for conservation and restoration rather than economic or agricultural.

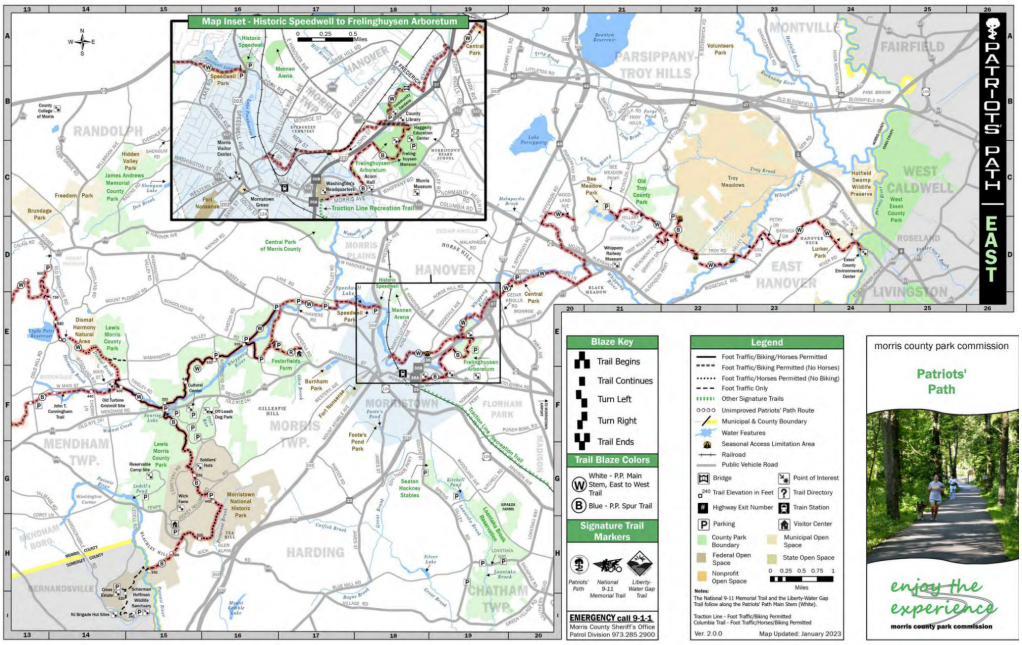

Figure 1: Trail Map of Patriot's Path. A large portion runs alongside Whippany River

Patriot's Path first began in 1968 as a collective effort to preserve the Whippany River. For this reason, snowed trails remain unplowed in order to protect vegetation in the riparian zone. Promotion of the Patriot's Path organization is fundamental to the preservation of the Whippany River.

The Whippany River Watershed Action Committee (WRWAC), founded in 1999, serves as a steward to the Whippany River Watershed. Some of their past actions include waste cleanups, removal of manmade debris to promote natural flow, and streambank protection via planting. Cooperation with the existing framework and efforts of the WRWAC will facilitate effective implementation of our goals.

Policies and Mandates

As a localized watershed, the Whippany River Watershed is subject to federal and state (New Jersey only) policies and mandates.

- Clean Water Act: CWA establishes regulation of pollution into waterways and the maintenance of water quality standards. Point pollution into waterways is unlawful without permit by NPDES
- National Historic Preservation Act: Protects land with historic, cultural, archaeological value.
    - Jockey Hollow, National Historic Park, sits within 5 miles of Whippany and Passaic Rivers..
- Endangered Species Act: Establishes limitations on development, pollution, and other activities which may threaten endangered species.
    - Several species of protected migratory birds inhabit Whippany River Watershed.
- New Jersey P.L.1977, c.74: Restricts discharge of pollutants into waterways, specifically thermal discharge, without permit. Effectually permitted New Jersey state enforcement of the Clean Water Act.

Governance Structure

Localized within Morris County, the governance of the Whippany River watershed falls broadly upon federal statutes, and largely upon state, county, and municipal oversight. The Whippany River Watershed Action Committee (WRWAC), composed of individuals, civic and business partners, and conservation groups, pushes forth community input to local and state legislations.

Problems

Problem	Description	Causes
P1: Analyze fecal coliform contamination into the river; sources and solutions	Fecal matter is being deposited into the river, and carried into Troy Meadows and the Passaic River.	Human activities, domestic animals, and wild animals, specifically geese, contribute to nutrient and bacterial deposition along the Whippany River.
P2: Erosion	Obstacles, such as a dumpster, are redirecting the flow of water and eroding the stream bank.	Hurricane Irene caused a dumpster to end up in the River, redirecting the natural flow of the water.
P3: Narrow Riparian Zone	Areas of the watershed are very highly developed, such as the stretch through Morristown, Morris Plains, Hanover, and East Hanover, often directly peripheral to the river.	A low retention time of the watershed area in conjunction with the naturally high flow velocity facilitates nutrients and other pollutants being flushed through and drained from the river at a high rate.

Problem 1: Fecal Pollution

Fecal nonpoint source loading is likely the most significant problem impacting the Whippany River, specifically contributing to fecal coliform deposition which is above the total maximum daily load (TMDL). Streams with cooler water that support trout populations are classified as FW2, and these streams, “shall not exceed a geometric average of 200 counts per 100 ml, nor should more than 10 percent of the total samples taken during any 30-day period exceed 400 counts per 100 mL” (N.J.A.C. 7:9B-1.14(c)1.ii). Current conditions result in a TMDL that is consistently above 200 counts per 100 mL (Figure 2).

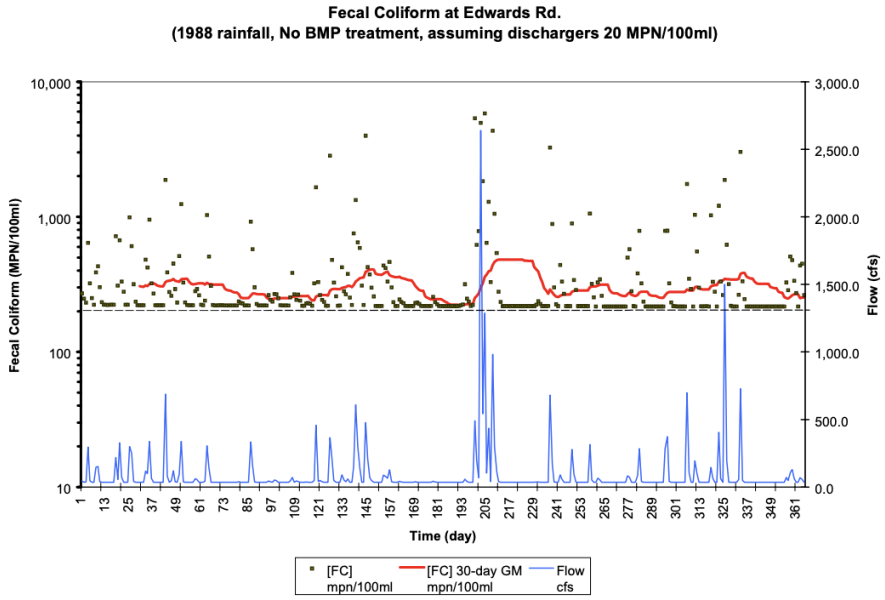

Figure 2: Model simulation of current conditions for fecal coliform at Edwards Rd. along Whippany River.

Sources of fecal coliform pollution are largely non-point, with only 0.1% of it being point source (Figure 3). Human sources are from malfunctioning and older septic systems, these are mainly found in the upper portion of this watershed. Other sources are from wildlife in the area (canadian geese, waterfowl, etc), pet waste, and stormwater basins that accumulate fecal matter from pets and wildlife. Large amounts of fertilized turf has been added to the area, which is preferred for some animals' diets, encouraging them to roam there.

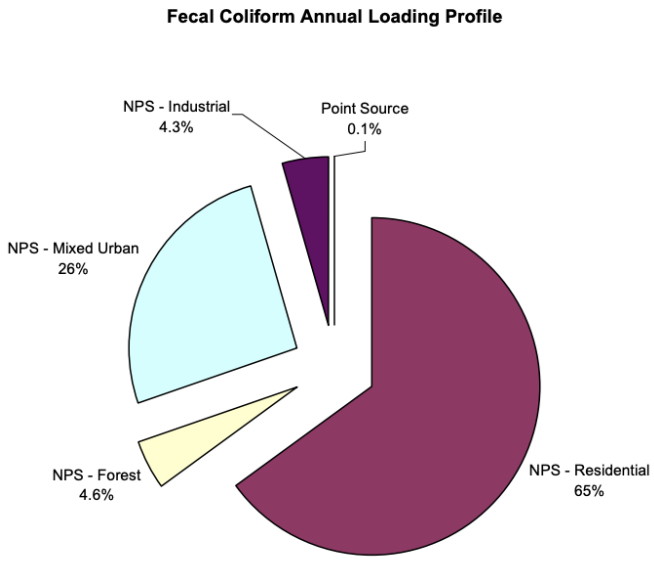

Figure 3: Sources of Fecal Coliform along the Whippany River

Goal 1: Reduce Fecal Pollution to Compliant Levels

Malfunctioning septic systems, wildlife, and pet waste need to be monitored and new restrictions or methods need to be implemented in order to reduce the amount of fecal matter being released into the environment and have the TMDL be below 200 counts per 100 mL.

Problem 2: Erosion and Flooding

The Whippany River has an abundant amount of debris, obstructions, and obstacles in it, which in turn has caused a change in the river's flow. The debris and obstacles not only lead to the change in the river's flow, but it has also led to flooding of the river. As the river floods, it overflows the banks causing more erosion of the banks, and this causes more debris and obstacles to fall into the river. This becomes a cyclical problem because the more debris, sediment, and obstructions going into the river causes the river to overflow. One of the big obstacles that is in the river is a big dumpster that was moved there by Hurricane Irene. This

dumpster has filled up with sediment and water which has caused it to weigh well over one ton. The dumpster has caused the change in the river's flow and has been causing even more erosion.

Goal 2: Remove Debris and Obstructions from the River

Removing the debris, dead trees, limbs, and other obstacles periodically is a great goal to reduce the amount of flooding and erosion of the Whippany River. Removing the dumpster is also a goal to help the river to return to its normal flow as well.

Problem 3: Narrow Riparian Zone

Human development proximal to the waterway has narrowed the riparian zone, which is the interface/transition zone between land and waterway. As a result, we can observe increased loading of nutrients, bacteria, salts, and other toxins from man-made activity. Loss of vegetation shading also causes increased temperature within the waterway.

Impermeable surfaces cause a decrease in time of concentration, within watersheds, and the extensive urban environment causes heightened flow rate into the waterway, leading to flooding and erosion. The Whippany River passes through and drains Morristown, one of the most intensively developed areas in the state.

Goal 3: Introduce Native Species and Green Spaces in High-Risk Zones

The city environment in Morristown has observed significant and continuous development to meet the technical, cultural, and economic needs of its residents. We seek to widen the riparian zone to meet ecological needs, while considering public and economic needs. By limiting development near the waterway, we can provide a green space as a resource to the

residents of Morristown while also widening the buffer zone between development and the waterway.

Summary of Goals

In order to improve the health of the Whippany River, we must understand what is causing the problems that the Whippany River has. After understanding the root of the cause of these problems, measures must be put in place, and actions must be taken to resolve these problems. To reduce the fecal matter in the river, the septic systems and the wildlife must be monitored, and restrictions must be put in place that help reduce pet waste in the river. A periodic cleanup or “desnagging” of the river is one way to help mitigate erosion and reduce the flooding of the river. Finally, we can introduce native species and green spaces to the area to widen the riparian zone. WRAP believes that meeting these goals will improve the overall health of the Whippany River.

***Recommendations*:**

To reduce nutrient pollution, WRAP recommends:

- Implementing surveys to diagnose the state of a septic system and its functionality.
- Minimizing the amount of fertilized turfgrass that wildlife has to graze on by:
    - Altering habitats by adding native shrubs and bushes.
    - Installing wire grids across ponds to restrict access (outside of molting periods).
    - Adding fencing to reduce access by waterways.
    - Having no feeding ordinances to keep wildlife from being attracted to the area by humans.
- Adding proper signage and plastic bag disposal areas for pet waste.
- Fines added for improper pet waste disposal.
- Stormwater basins should be regularly cleaned out to avoid accumulation of fecal matter.

To reduce erosion/flooding, WRAP recommends:

- Identification of problematic zones to construct retention basins which slow the movement of water
- Monitoring and removal of unnatural obstacles that enter the river.

To mitigate a narrowed riparian zone, WRAP recommends:

- In conjunction with WRWAC and Morristown residents, advocate the City of Morristown to prevent further development near the waterway.
- In conjunction with WRWAC and Morristown residents, advocate the City of Morristown to eliminate/relocate a parking lot on Bishop Nazery Way to allow for the creation of a public green space/rain garden.

- Planting of native New Jersey trees and shrubs along the riverbed could help to increase time of concentration, dampening peak flow rate and curtailing erosion.

Conclusion

In conclusion, our action plan is focused on the conservation and restoration of the river rather than the economics and agriculture that it supports. In our plan, we discovered a few problems and developed some possible solutions or recommendations. The problems we discovered were that fecal matter was being deposited into the river which was contaminating nearby runoffs, erosion is carving the environment around the river, and the river is becoming overdeveloped because nutrients are coming and leaving at a super high rate (Narrow Riparian Zone). To minimize fecal waste in the river, we recommend that there should be surveys and analysis of the septic systems and steep fines for people who put pet fecal waste in unpermitted areas and we should minimize the amount of turfgrass animals can graze on. There should also be proper signage and rules posted for people to follow. Erosion is a common problem in many other watersheds like the Yukon Environment Target of Intent (YETI). We recommend that there should be proper identification of problematic zones and that obstacles which restrict water flow are removed.To mitigate a narrowed riparian zone, we recommend that the nearby residents should advocate against further development and the installation of a public green space or garden. We also recommend that plants and shrubs along the riverbed.

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