WASHINGTON FORGE POND MANAGEMENT PLAN

Wharton Borough, Morris County

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Wharton Borough
10 Robert Street
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Contents

Introduction

Through the passage of New Jersey Highlands Water Protection and Planning Act in 2004, the New Jersey Highlands Water Protection and Planning Council (the Highlands Council) was created and charged with developing a Regional Master Plan (RMP). Adopted in 2008, the RMP serves as a guiding document for the long-term protection and restoration of the region's critical resources. This Management Plan was developed in accordance with Policy 1L6 of the RMP.

The purpose of the Washington Forge Pond Management Plan is to provide management goals and strategies for the long-term health of the pond. The Plan provides baseline information related to Washington Forge Pond and its drainage area and based on that information sets goals, objectives and identifying action items that will help guide the responsible management of Washington Forge Pond.

Pond Introduction

Washington Forge Pond is a manmade pond located in Wharton Borough, Morris County. The pond is located in the northcentral portion of the Borough, south of Dewey Avenue, and west of North Main Street. This portion of the Borough is located in the Upper Passaic, Whippany and Rockaway watershed. More specifically, the pond is located in the HUC14 subwatershed 02030103030070 (74d 33m 30s to Stephens Bk). The Rockaway River flows from west to east through Washington Forge Pond.

In 1795, Charles Hoff built the Washington Forge. Many small pits were dug around the forge area. Eventually, the pits formed into one big pit which became known as Washington Forge Pond and later known just as Washington Forge Pond. [1]The pond is resulting from the construction of the forge and later the Washington Forge Pond dam. The dam is an earthen construction gravity dam. Its height is 10 feet with a length of 710 feet. Maximum discharge from the dam is 1,207 cubic feet per second. The dam's total capacity is 96-acre feet. Normal storage is 63-acre feet. The pond drains an area of 29.1 square miles. [2]

The pond covers two tax lots, identified as Block 703, Lots 29 & 31, in the municipal tax records and is owned by the Borough of Wharton. In addition to the pond lots there are several parcels surrounding the pond that are owned by the Borough.

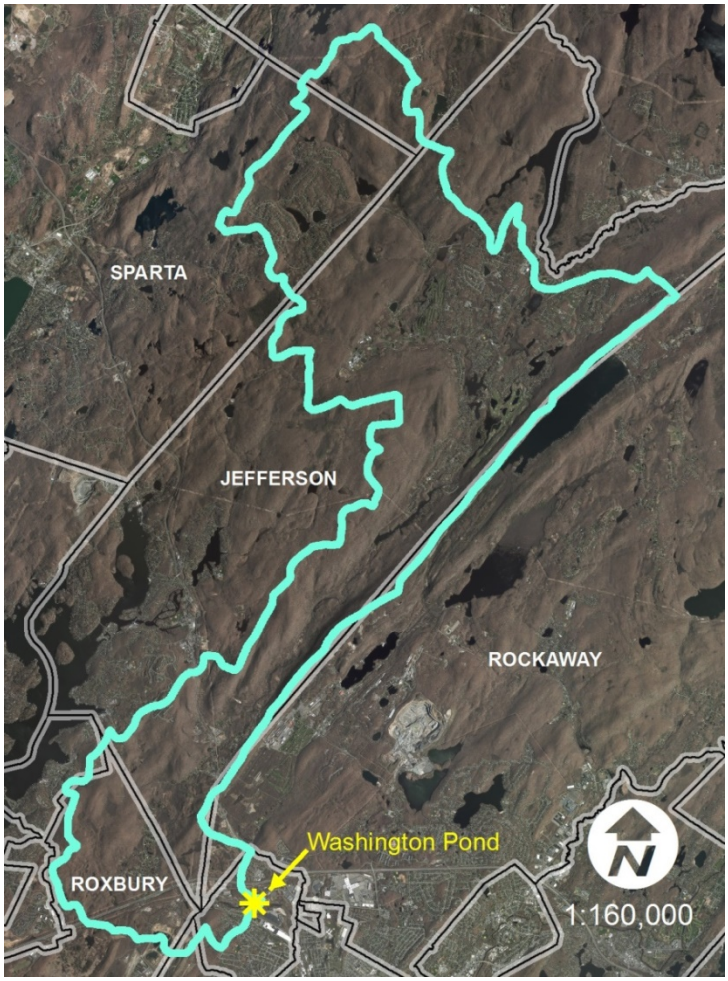
[1] http://nynjctbotany.org/njhltofc/whartonboro.html
[2] http://findlakes.com/washington_forge_pond_new-jersey~nj00341.htm

Situational Analysis

A Situational Analysis helps to derive the goals and objectives of the Management Plan. This is essentially done in two parts. First, scientific goals are developed based on the physical attributes of the pond. This is includes conducting research on the watershed using surface water quality data related to the pond and studying the overall trophic state of the pond. The second part of the Situational Analysis integrates the goals based on scientific attributes with the goals derived from public input.

Physical

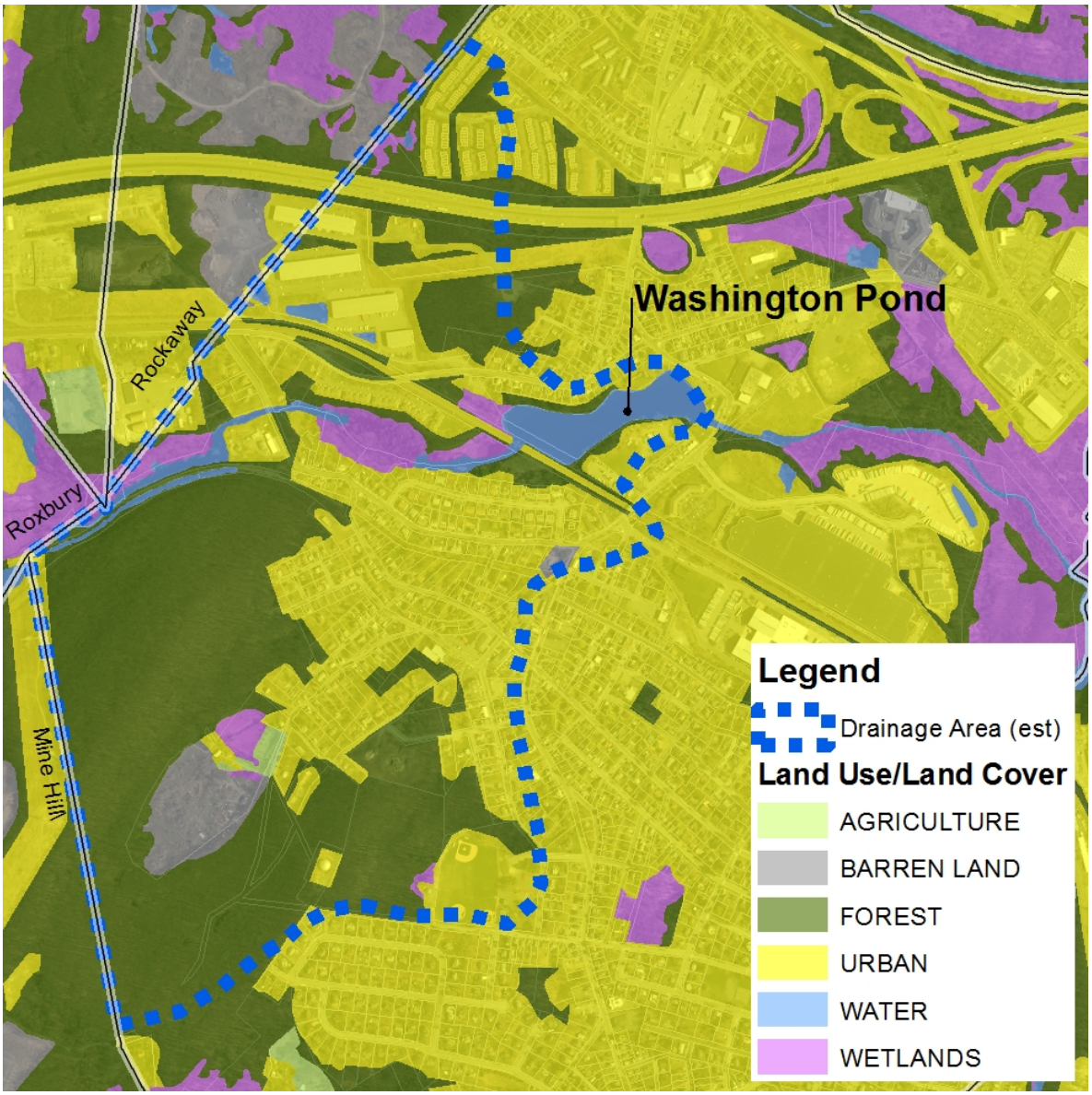
Washington Forge Pond is approximately 9.5 acres, with roughly 3,650 feet of shoreline measured from the portion of the pond stretching from the railroad tracks to the dam. The estimated average depth is approximately 8 feet, and the estimated volume of the pond is 26,925,157 gallons or 83-acre feet. The above depth and volume figures are estimates. A more detailed bathymetric survey would provide accurate depth and volume figures.



The drainage area for Washington Forge Pond includes: Mine Hill Township, Rockaway Township, Roxbury Township, Jefferson Township and Sparta Township. The total area of the watershed is over 30 square miles or roughly 15 times the entire area of Wharton Borough. With such a large area under multiple jurisdictions, it is difficult to manage all of the potential impacts to the water entering Washington Forge Pond.

For the purposes of this Management Plan, the drainage area was estimated for those lands within the Borough boundary. In addition to utilizing the global drainage areas generated from USGS, local level contours and local storm drainage systems were evaluated as part of the drainage area.

The drainage area for the pond within the Borough of Wharton is estimated to be approximately 420 acres or 0.66 square miles, approximately 2% of the total drainage area for the pond.



The estimated drainage area is dominated by Urban (42.4%) and Forest (46.5%) land use/land cover categories. The areas of Forest are primarily deciduous forest with a greater than 50 percent crown closure and the Urban land use category consists mainly of residential land uses.

Chemical

A robust dataset of the chemical makeup of Washington Forge Pond does not currently exist. This chemical makeup would define the waters by the concentration of minerals, nutrients and suspended constituents present. It should be noted that chemical concentrations of the pond water are likely to change both seasonally and annually.

The NJDEP's Total Maximum Daily Load (TMDL) Look-Up Tool provides information on a municipality's watersheds that have had a TMDL established, approved or adopted. The look-up indicates that Washington Forge Pond's sub-watershed (02030103030070-Rockaway R (74d 33m 30s to Stephens Bk)) has two applicable stream TMDL(s).

1. "Amendment to the Atlantic, Cape May, Lower Delaware, Lower Raritan-Middlesex, Mercer, Monmouth, Northeast, Ocean, Sussex, Tri-County, Upper Delaware and Upper Raritan Water Quality Management Plans. Total Maximum Daily Load for Mercury Impairments Based on Concentration in Fish Tissue Caused Mainly by Air Deposition to Address 122 HUC 14s Statewide. Adopted: June 10, 2010."

2. "Amendment to the Northeast, Upper Raritan, Sussex County and Upper Delaware Water Quality Management Plans. Total Maximum Daily Load Report For the Non-Tidal Passaic River Basin Addressing Phosphorus Impairments. Watershed Management Areas 3, 4 and 6. Adopted: April 24, 2008."

Any future data collections should include assessments of any phosphorus impairments, as well as the potential presence of any mercury impairments.

Hydrologic

The map below depicts the approximate drainage area supplying Washington Forge Pond within Wharton Borough. Also shown are outfalls that discharge within this drainage area. It is these outfalls that may contribute to sedimentation of Washington Forge Pond and are excellent candidates for mitigation projects to reduce sedimentation flowing into the pond.

Biology

A survey of area lakes listed in the NJ Fish and Wildlife "Fish of North Jersey" and consultation of local fishermen indicate the possible presence of several fish species in the pond including: large mouth bass, catfish, yellow perch, sunfish, and pickerel.

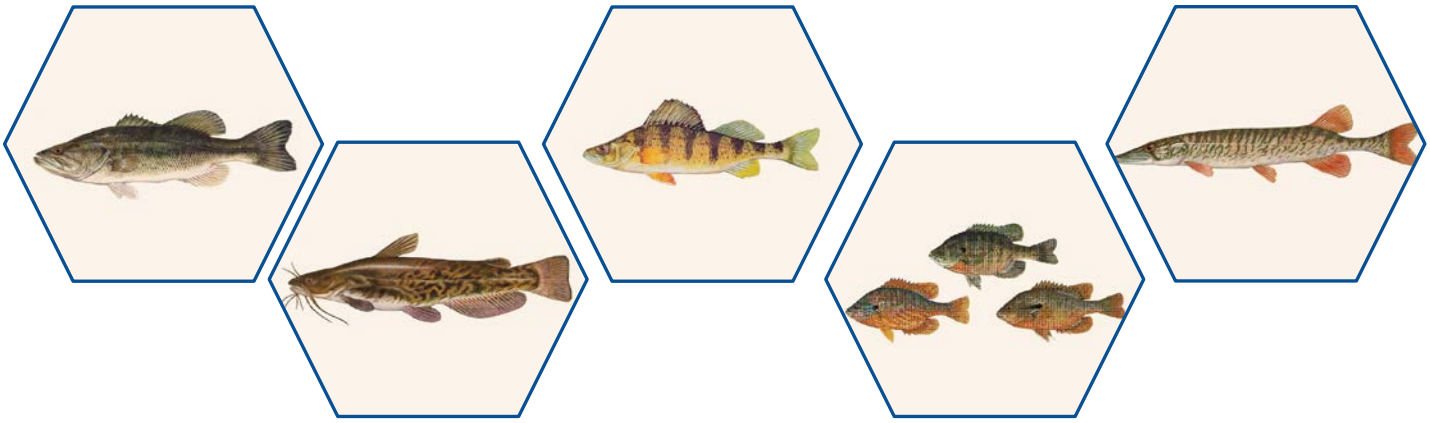


Photo Credits: "Great Fishing Close to Home: In Northern New Jersey", NJ Fish and Wildlife,

The New Jersey Landscape Project identifies Washington Forge Pond as being suitable habitat for the Great Blue Heron, Bald Eagle, and the Indiana Bat. The estimated drainage area within Wharton Borough includes habitat for Northern Myotis, Bobcat, Indiana Bat, Black-throated Blue Warbler, Golden-winged Warbler, Barred Owl

Photo Credits: New Jersey Landscape Project, Version 3.3 Report; Audubon. Guide to North American Birds.

The Landscape Project has also identified vernal pools in the estimated drainage area. Vernal pools are confined depressions, either natural or man-made, that hold water for at least two consecutive months out of the year, and are devoid of breeding fish populations. Vernal pools provide habitat to many species of amphibians, insects, reptiles, plants, and other wildlife. The absence of fish is the essence of these ecosystems.

"What is the Landscape Project? Designed to guide strategic wildlife habitat conservation, the Landscape Project is a pro-active, ecosystem-level approach for the long-term protection of imperiled species and their important habitats in New Jersey. The N.J. Division of Fish and Wildlife's Endangered and Nongame Species Program (ENSP) began the project in 1994. Its goal: to protect New Jersey's biological diversity by maintaining and enhancing imperiled wildlife populations within healthy, functioning ecosystems."

http://www.nj.gov/dep/fgw/ensp/landscape/

Regulatory

According to the New Jersey Surface Water Quality Standards, the Washington Forge Pond is classified as a FW2-NTC1 category water body. The FW2 is defined as the general surface water classification applied to those freshwaters that are not designated as FW1 or pineland waters. NT stands for Non-Trout waters. C1- stands for Category One Waters. These waters are strictly regulated for implementation of antidegradation policies for protection from measurable changes in water quality based on exceptional ecological significance, exceptional recreational significance, exceptional water supply significance or exceptional fisheries resource to protect their aesthetic value (color, clarity, scenic setting) and ecological integrity (habitat, water quality and biological functions).

The Rockaway River flows through Washington Forge Pond from the west to the east and continues east through the Borough. The Rockaway River has also been classified as FW2-NTC1 or Category One Waters.

NJDEP regulations that pertain to the Washington Forge Pond include riparian areas, wetlands and flood hazard areas.

Stakeholder Input

In June 2017, the Borough held a public information session/stakeholder meeting. This was a joint meeting between the Planning Board and the Borough Council. The meeting was structured to discuss the Borough's strengths, weaknesses, opportunities and threats (SWOT). As part of this analysis, Washington Forge Pond was discussed as a strength and an opportunity. It was agreed that the Washington Forge Pond is an asset to the community and serves many purposes, including wildlife habitat, aesthetics, and recreation. Concerns were raised related to weed proliferation and shallow depth resulting from sedimentation.

Adaptive Lake Management

Adaptive Lake Management is a flexible management technique that recognizes the complexity of natural systems and identifies an approach that allows for changing parameters to address goals based on the measurement and success of outcomes from various management techniques. As a result, modification through one management technique may create a change in another attribute of the lake, requiring adaptation of the original technique. The illustration below summarizes the management technique:

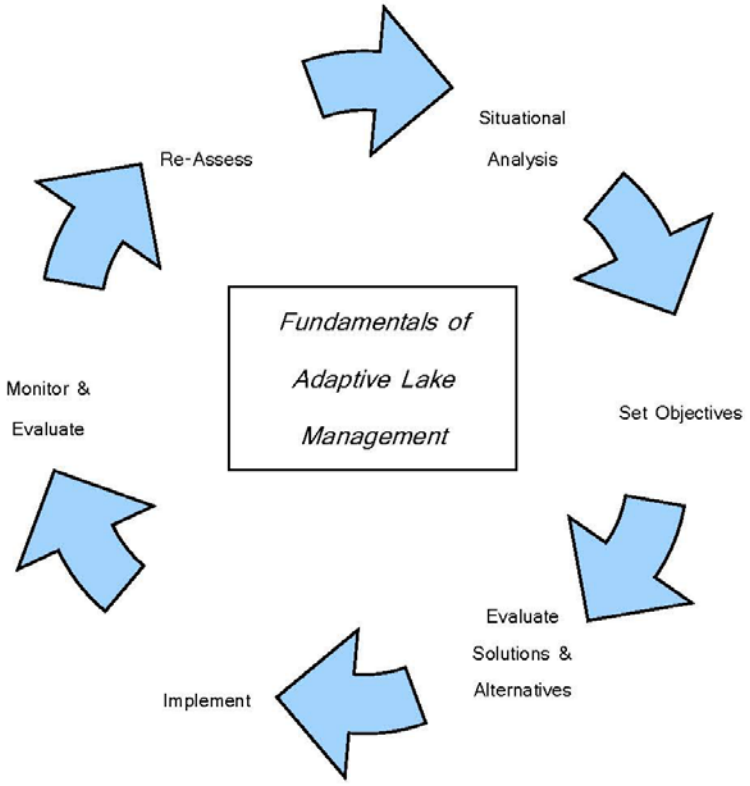


Illustration Credit: NJ Highlands Lake Management Plan Guidance Document (Figure 1)

Goals, Objectives & Action Plan

The Goals, Objectives and Action Items listed below are the result of the Situational Analysis conducted for Washington Forge Pond, evaluating scientific attributes of the pond and goals for meeting optimal conditions which were then aligned with public input. Ongoing monitoring is recommended in order to utilize Adaptive Lake Management techniques to continue to update the management goals, objectives and action items for the pond.

Goal 1: Develop a robust water quality database.

Objectives – The following should be completed to create the database:

a) Regularly monitor the area, maximum depth, mean depth and volume of the pond.
b) Measure the annual volume of water entering or leaving the pond.
c) Monitor water quality, at regular intervals and at least in April, May, June, July, August, October and November including:
    i. Dissolved oxygen (DO), pH, temperature, conductivity, and total alkalinity data collected in profile from surface to bottom at 1-meter (3 feet) increments;
    ii. Total phosphorus and nitrogen concentrations measured at surface and bottom; and
    iii. Water clarity (utilizing Secchi disk to identify depth of clarity).
d) Accurately identify the types of zooplankton, phytoplankton and macroalgae present in the pond in May, July, and August.
e) Accurately identify aquatic plants present in the pond, including assessment of each plant's density and distribution as measured in May, July, and August.

Goal 1 Action Items:

a) Contract with lake management company to reduce algae and weed proliferation through continued data collection, observation and maintenance.
b) Utilize adaptive lake management planning to evaluate and update plan goals and objectives.

Goal 2: Reduce potential impacts from the surrounding residential uses including phosphorous and fecal coliform pollution.

Objective – Improve water quality by reducing pollutants.

Goal 2 Action Items:

a) **Distribute phosphate fertilizer reduction information to residents within Wharton Borough drainage area.**
b) **Pass phosphate fertilizer restriction ordinance for areas within the Washington Forge Pond drainage area.**

Goal 3: Control algae bloom development.

Objectives – Improve water quality by reducing algal blooms.

a) Closely monitor algal assemblages.
b) Identify and implement algal control strategies before peak bloom conditions.
c) Review the need for and potential effectiveness of algaecides.

Goal 3 Action Item:
Contract with lake management company to reduce algae and weed proliferation through continued data collection, observation and maintenance.

Goal 4: Increase oxygen levels in the pond.

Objectives:

a) Promote beneficial bacteria growth.
b) Prevent low oxygen fish kill.
c) Reduce nutrient levels and associated algae growth.
d) Oxidize/reduce bottom muck.
e) Expand oxygenated habitat for improved fisheries.
f) Reduce aquatic midge and mosquito insect hatches.
g) Eliminate potential of foul odors from undesirable dissolved gases.

Goal 4 Action Item:
Install aeration system in the pond.

Goal 5: Develop a public outreach and education program.

Objectives:

a) Reduce non-point source pollution in the pond.
b) Improve vegetation around the pond by educating nearby residents.

Goal 5 Action Items:

a) Provide information to residents on preventive pollutant load management techniques that can be easily implemented by any homeowner.
b) Provide information to residents on methods for maintaining natural ground covers in lieu of manicured lawns and supplementing areas having sub-optimal ground cover with selected native plantings.

Goal 6: Control stormwater run-off, reduce and remove siltation.

Objectives:

a) Continue implementation of the Borough's ordinance to control stormwater run-off.
b) Utilize BMP's (using green infrastructure where feasible) for development in the watershed area.
c) Review levels of siltation and ability to remove silt from the pond.

Goal 6 Action Items:

a) Minimize sediment infiltration by addressing stormwater outfalls that discharge within the Borough-controlled pond drainage area.
b) Identify outfalls and include them in the Stormwater Mitigation Plan.
c) Review possible methods for silt removal.

Goal 7: Preserve and protect the undeveloped Borough-owned land around the pond and create public access points.

Objective – Increase opportunities for a boardwalk or other access feature.

Goal 7 Action Item:

Review Borough-owned property and identify opportunities for improved pond access points. Identify potential locations for a boardwalk.

Goal 8: Coordinate and encourage water quality enhancement efforts with upstream municipalities.

Objective – Reduce upstream water quality issues including pollution.

Goal 8 Action Item:

Evaluate possible partnership opportunities with upstream municipalities.