Whippany River
A Holistic Approach to Volunteer Monitoring
• Swift or smooth, broad as the Hudson or narrow enough to scrape your gunwales, every river is a world of its own, unique in pattern and personality. Each mile on a river will take you further from home than a hundred miles on a road. - Bob Marshall
The Whippany River, approximately 20 mi (32 km) long is a tributary of the Rockaway River, and part of the Passaic River Basin. Watershed is approximately 69.3 mi²

Headwaters are in Mendham, Morris County and it flows east/northeast through Morristown and the Whippany area of Hanover Township.

Joins Rockaway River in Hatfield Swamp in eastern Morris County just prior to the Rockaway joining the Passaic River.

Name comes from the Whippanong Indians, Whippanong meant “place of the willows”

Wikipedia 2009
Land Use in Whippany River Watershed

Whippany Watershed Land Use

Source: Township of Hanover Health Department (2005)
Our Mission

• The Whippany River Watershed Action Committee's members are the stewards of the Whippany River Watershed. The members have come together to preserve, protect and maintain the land and water resources of the watershed through broad-based community action, projects, on-going assessment, education and promotion of resource conservation.
Member Towns

At present, thirteen of the sixteen watershed municipalities are members:

• Denville,
• East Hanover,
• Florham Park,
• Hanover,
• Madison,
• Mendham Borough,
• Mendham Township,
• Morris Plains,
• Morris Township,
• Morristown,
• Mountain Lakes,
• Parsippany-Troy Hills, and
• Randolph.
WRWAC

• Celebrated 10\textsuperscript{th} Anniversary September 2009
Volunteers do more than collect data
Whippany River Watershed Action Committee

- 16 municipalities in watershed
- Began as Mayors Action Committee in 1998
- Evolved into 501 c(3) not for profit WRWAC
- Have been partnered in well over dozen grants with NJDEP, Victoria Foundation, municipalities, Rutgers University, Pfizer and other corporate sponsors
- Canoe trips, festivals, hikes, educational outreach, schools and civic organizations, engineering roundtables, goose workshops, stormwater conferences
Volunteer Monitoring

• To increase the knowledge/understanding of our river
• To increase the skills/knowledge of the volunteers
• To increase understanding of what the data actually means
• To provide long term data sets
• To identify issues of concern
• To select potential sites for installation of Best Management Practices (BMPs)
Volunteer Monitoring

- Visual Assessments (some volunteers trained at Rutgers, some with Danielle, some both protocols)
- Goose Monitoring Program
- Trends Analysis
- Lake Study

Stormwater monitoring for fecal coliform and Escherichia coli and in-situ for Temperature, pH, conductivity, dissolved oxygen

Trained to do basic macroinvertebrate sampling
Visual Assessment
New Jersey Department of Environmental Protection
Volunteer Monitoring Program

Fields marked with * are required by E2

General Sheet

Segment ID/ Site Name: _________________  Assessment # of the year: ___________

* Water Body Name: _________________  * Watershed Management Area: __________

* County: ___________________________________________________________________

* Segment Identification

  Beginning at Latitude/Longitude: _____________________________________________
  Ending at Latitude/Longitude: _____________________________________________

* Survey Team: ___________________________________________ * Time: __________

___________________________________________________________________________ * Date: __________

Weather:

|-------------------|----------|-----------------|------------|----------------------|---------------|-------------|--------|------------------|

Check one:

☐ Days since last rain: __________
☐ More than one week since last rain
☐ More than one month since last rain

Air Temperature: _______________ ° F

Water Temperature: ______________ ° F

Site Sketch: includes riffles, pools, runs, ditches, siphon, outfalls, roads, sampling, locations, photo reference #, GPS reference #

1. Lake / Parkland Description

a. Ownership
   - Municipal
   - County
   - State
   - Private

b. Lake Association Contact Info

   c. Swimming Beaches
      - Boating
      - Trails
      - Parklands

      - Recreational fields
      - Lawns
      - Meadows
      - Other

2. Describe Lake Shoreline Vegetation

   - % Shoreline mowed lawn
   - % Shoreline Privately Owned
   - % Shoreline 2-3 ft tall shrubs and vegetation
   - % Shoreline Wooded / Tree lined

3. Describe Goose Populations Present

   - < 20 geese
   - 20 - 50
   - 50 - 100
   - 100 - 200

4. Describe Nesting Areas

   - How many goose nests are present

5. Describe Foraging Areas

   - Lawns
   - Parking Areas
   - Meadows
   - Recreational Ballfields

6. Describe Goose Mitigation Measures

   - Signage - Do not feed geese
   - Flagging
   - Egg salting
   - Egg adding

   Identify who performs the work

   - Dog Silhouettes
   - How many goose nearby
   - < 100 ft
   - > 100 ft

   - Other programs
Goose Monitoring Program - Visual Assessments of Lakes, Parklands, Public Lands

1. Lake/Parkland Description
   a. Ownership
      - Municipal __ County __ State __ Private __
   b. Lake Association Contact info ____________________________
   c. Swimming Beach:  __ Boating:  __ Trails:  __ Parklands:  __
   d. Recreational fields:  __ Lawns:  __ Meadows:  __ Other:  __

2. Describe Lake Shoreline Vegetation
   - 50% Shoreline covered with lawn
   - 50% Shoreline covered with trees
   - 10% Shoreline free of vegetation

3. Describe Goose Populations Present
   - < 20 geese  - 20 < 50  - 50 < 100  - 100 < 200  - > 200

4. Describe Nesting Areas
   - 5.3.2.1 How many goose nests are present:

5. Describe Foraging Areas
   - Lawns:  __
   - Parking Areas:  __
   - Meadows:  __
   - Recreational Fields:  __

6. Describe Goose Mitigation Measures
   - Signage:  __ Do not feed geese:  __ Flattening:  __ Egg collecting:  __ Egg adding:  __
   - Identify who performs the work:  __
   - Dog Silhouettes:  __ How many:  __ Other programs:  __

7. __________
Geese Monitoring Program - Visual Assessments of Lakes, Parklands, Public Lands

Monitor Name(s): PAUL RECTOR Date: OCT 9, 2009

Volunteer Hours Used for This Assessment: 1

Lake/ Park Name: MORRIS COUNTY FACILITY

Address / Location: 250 N HANOVER AVE

Municipality: MORRIS PLAINS

GPS coordinates if recorded: ___________________________

1. Lake / Parkland Description
   a. Ownership
      Municipal       County   State     Private
   b. Lake Association Contact info: ___________________________
   c. ______ Swimming Beach ______ Boating ______ Trails ______ Parklands
      ______ Recreational fields ______ Lawns ______ Meadows ______ Other ______

2. Describe Lake Shoreline Vegetation
   100% Shoreline mowed lawn
   % Shoreline Privately Owned
   % Shoreline 2-3 ft tall shrubs and vegetation
   % Shoreline Wooded / Tree lined

3. Describe Goose Populations Present
   ______ < 20 geese ______ 50 ______ < 100 ______ 100 ______ > 200 ______

4. Describe Nesting Areas
   ______ How many goose nests are present ______

5. Describe Foraging Areas
   ______ Lawns ______ Parking Areas ______ Meadows ______ Recreational Ballfields ______

6. Describe Goose Mitigation Measures
   ______ Signage – Do not feed geese ______ Flushing ______ Egg oiling ______ Egg adding ______
   Identify who performs the work: ___________________________
   ______ Dog Silhouettes ______ How many ______ Other programs ______
   ______ are goose nearby ______ < 100 ft ______ > 100 ft ______
Trends Analysis

- Dr. George Van Orden
- Ralph Rhodes (Mendham Township Environmental Commission)
- Garry Annibal *Harding Township Health Administrator)
- Mary Arnold (WRWAC)
- Pete Summers (Health Officer East Hanover Township)
Trends Analysis

- The WRWAC Technical Advisory Committee (TAC) devised sampling protocols and created database
- Sampled at established locations (5 sites)
- Temperature, Dissolved Oxygen, pH, Nitrate Nitrogen, Nitrite Nitrogen, Ammonia Nitrogen, Total Kjeldahl Nitrogen, Ortho Phosphorus, Total Phosphorus, TSS, TDS, Alkalinity, Chloride, Conductivity, BOD, chl a, Enterococcus, fecal coliform
LOCATION: Off Melanie Lane, near Ridgedale Ave.

OBSERVATIONS: Wadable, partial rock/mud bottom
Stream Width 38 ft. ave.
Stream Depth 4.5 ft. ave.

LONG/LAT: 14 - 74 23'13.9"W - 40 45'55.8"N

LOCATION: Edwards Rd. where it dead ends with Whippany R.

OBSERVATIONS: Hip boots needed, depth of water and mud vary
by time of year and rainfall. May sample off Edwards rd., bridge if
water too high. Stream Width 55 ft. ave. Stream Depth 4.5 ft. ave.

LONG/LAT: 17 - 74 20'50.8"W - 40 50'42.8"N
Trends Analysis

• The Trends Analysis will be continued, even without any outside funding for this event. Conducted approximately every 5 years.

• WRWAC considers it important enough to fund on their own.
Up River Mean for chloride concentrations
And down

River Mean Total Phosphorus

<table>
<thead>
<tr>
<th>Date</th>
<th>Concentration (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994/1995</td>
<td>0.45</td>
</tr>
<tr>
<td>2001/2002</td>
<td>0.2</td>
</tr>
</tbody>
</table>
The TAC selected and sample five lakes in the watershed. The lakes include Lake Parsippany, Sunrise Lake, Mountain Lake, Bee Meadow Pond, and Speedwell Lake.

The sampling team will use the Trimble GPS unit to locate the sampling sites;

Sampling was conducted during dry weather conditions in the summers of 2003, 2004 and 2005;

Dr. Van Orden led a team of volunteers from municipal health departments and environmental commissions. During sampling in the field, all team members learned how to use monitoring and GPS equipment.

After samples were collected they were immediately delivered to a certified laboratory (Garden State Laboratories, Inc.) for testing. Because fecal coliform is the major pollutant of concern in the Whippany River at this time, samples were handed off to the lab within six hours after they are drawn from the river.
Water Quality Parameters

- temperature,
- dissolved oxygen (DO),
- pH, conductivity,
- specific conductivity,
- salinity and secchi depth
- Nitrogen series
- Phosphorus (ortho-P), (Total-P),
- total suspended solids (TSS),
- total dissolved solids (TDS),
- total alkalinity,
- chlorophyll A,
- fecal coliform and
- fecal streptococcus.
- Sediment samples were also collected at each lake and analyzed for total Kjeldahl nitrogen (TKN), ammonia nitrogen (NH3-N), nitrate nitrogen (NO3-N), orthophosphorus (ortho-P), total phosphorus as phosphorus (Total-P), fecal coliform and fecal streptococcus.
Mountain Lakes Sampling

Mountain Lake Depth and Sampling Locations

Source: Township of Hanover Health Department (2005)
Mountain Lakes Sampling Sites
Mountain Lakes Results for Dissolved Oxygen
Mountain Lakes fecal coliform

**FIGURE 7**: Mountain Lake Fecal Coliform
Mountain Lakes Total Phosphorus

FIGURE 4: Mountain Lake Total Phosphorus
Speedwell Lake

Source: Township of Hanover Health Department (2005)
Bee Meadow Pond
Bee Meadow Dissolved Oxygen

![Bar graph showing dissolved oxygen concentrations at different locations: Epilimnion, Hypolimnion, Inlet, and Outlet. The Epilimnion has the highest concentration, followed by the Outlet, then the Inlet, with the Hypolimnion having the lowest concentration.](image-url)
Comparison of Lakes data (TP)
Sampling sites for Whippany Restoration Plan
Whippany River at Old Brookside Rd – Station #1
Whippany River at Lake Valley Road Station
#3
Whippany River at Speedwell Lake Station #4
Whippany River at S. Beverwyck Road #7
Whippany River at Edwards Road #8
Training - Bacteriological and in-situ
Volunteer Monitoring training

A WRWAC VOLUNTEER'S HANDBOOK
TO BASIC STREAM MONITORING

Prepared by:
Princeton Hydra, LLC
1108 Old York Road
Ringoes, New Jersey 08551
908-237-5660 (P)
908-237-5666 (F)
QUALITY ASSURANCE PROJECT PLAN (QAPP)
“Watershed Restoration and Protection Plan for the Whippany River Watershed”
Water Quality Monitoring Component

Prepared by: Mr. Christopher L. Mikolajczyk
Princeton Hydro, LLC

Reviewed by: Mr. Stephen J. Souza, Ph.D.
Princeton Hydro, LLC

Reviewed by: Mr. Arthur W. Vespignani, Project Coordinator
Whippany River Watershed Action Committee

Reviewed by: Ms. Pat Rector, Project Manager
NJDEP, Division Watershed Management, Bureau of Watershed Planning

Reviewed by: Ms. Helen Pang, Research Scientist
NJDEP, Division Watershed Management

Approved by: Mr. Marc Ferko, Quality Assurance Officer
NJDEP Office of Quality Assurance

Date: 3/19/09

Date: 3/19/09

Date: 4/20/09

Date: 5/15/09

Date: 6/15/09

Date: 6/15/09
**WHIPPANY RIVER WATERSHED ACTION COMMITTEE**  
**VOLUNTEER MONITORING DATA SHEET**  
**Metering & Sampling Observations**

**NJDEP 319h Grant RP08-055**  
Pollution Control & Management Implementation

**Date**  
10/14/09

**Time:**  
Start 07:55  Finish 10:08

**Sampling Site**  
#2 Washington Valley Rd, Morris Twp

**Weather Conditions**  
Overcast 40°

**In-Situ Measurement:**

<table>
<thead>
<tr>
<th>Stream Depth</th>
<th>Temp (°C)</th>
<th>D.O. (mg/L)</th>
<th>pH (s.u.)</th>
<th>Sp. Cond. (mhos/cm)</th>
<th>Turbidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10”</td>
<td>7.12</td>
<td>10.02</td>
<td>8.19</td>
<td>0.297</td>
<td>3.2</td>
</tr>
</tbody>
</table>

**Noted Observations:**

**Discrete Samples Collected?**  
Yes

**Samples delivered to lab?**  
Yes

**Signature**  
[Signature]

**Date**  
10/14/09
Next Steps

- Newest Trends Analysis was conducted summer 2009 and spring 2010
- Continue with Visual Assessments
- Continue chemical and in-situ monitoring
- Continue with Goose surveys
- Involve even more volunteers in monitoring program
- Report outs to member municipalities
Monitoring for real use

- Data greatly utilized to educate residents (eg. Festivals) and municipalities
- Annual Report
- Data utilized to identify areas of concern
- Data utilized to provide BMP sites
For more information

• For more information please contact
  – Art Vespignani art724@aol.com
  – Whippany River website
    • www.wrwac.org