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# The Status of Pompeston Creek, 1998-2008: From Data to Action

## **Pompeston Creek Watershed Association**

### Volunteers in Action, Helping Our Communities

Presented by: Debbie Lord

NJ Water Monitoring Summit

December 1, 2011

# The Status of Pompeston Creek, 1998-2008

## Presentation Overview

- PCWA's Volunteer Programs:
  - Education
  - Restoration and Cleanup
  - Monitoring
- Background on Pompeston Creek Watershed and Issues
- Water Quality Results and Significant Findings - Impairments
- Recommendations – We CAN Make a Difference!
- Next Steps--Pompeston Creek Regional Stormwater Management Plan Implementation (Rutgers) and Continued Stream Monitoring



# Pompeston Creek Watershed Association

- **Volunteer Organization** founded in 1963
- **Mission:** to promote the restoration and conservation of the natural resources of the Pompeston Creek watershed; to protect and conserve animal life, forests and other plant life, water sources and soils through education, scientific investigations and research.
- **Three Program Areas:** Monitoring, Education, and Restoration

## Education

- Schools
- Municipalities
- Communities (NJ Stormwater Education Requirement)



## Restoration and Cleanup

- Stream Cleanups (trash)
- Streambank Restoration
- Detention Basin Retrofits



## Monitoring

- Water Quality Monitoring
- Biological Assessment
- Stream Visual Assessment

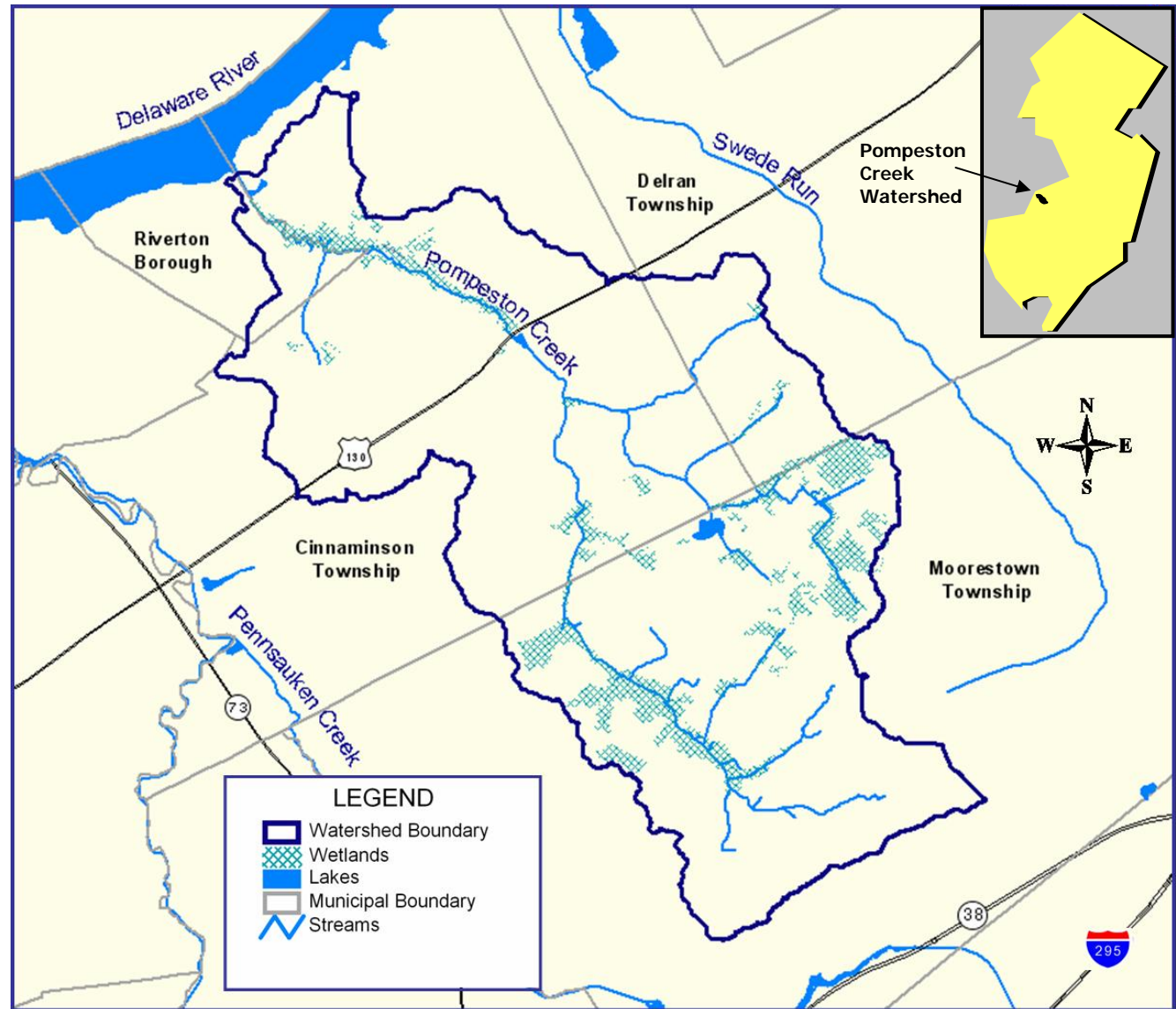


# How PCWA Uses Data from its Volunteer Monitoring Programs

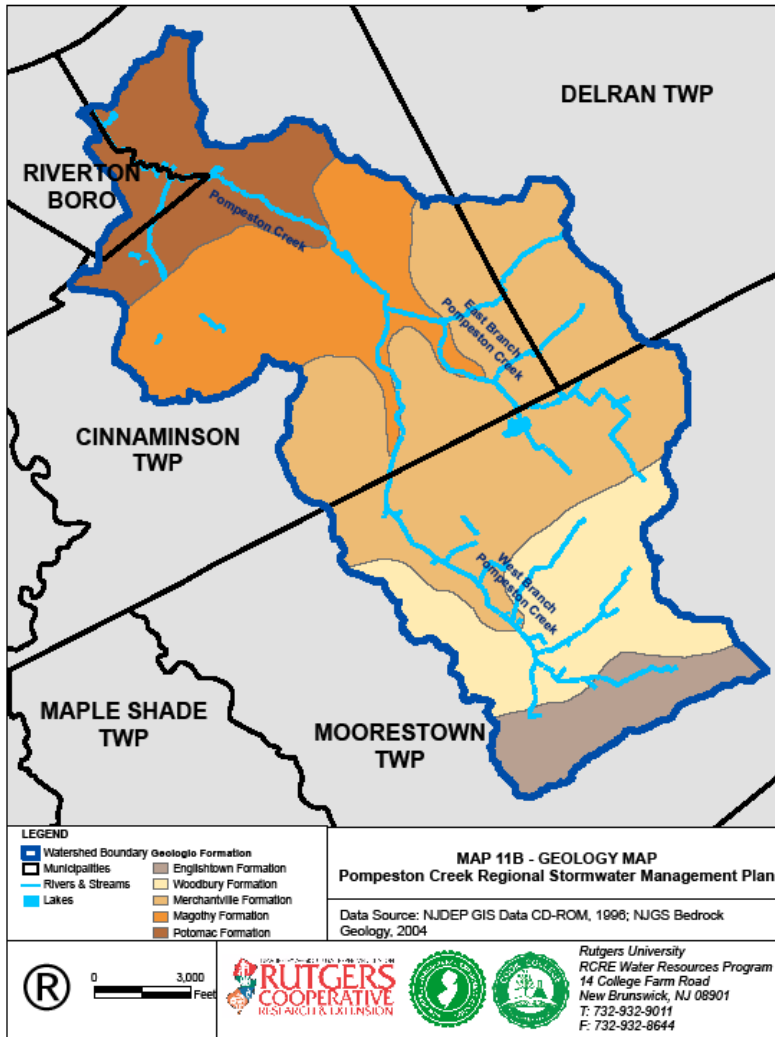
1. **Chemical and bacterial data: (Tier D)** –
  - a. Regulatory use - used to obtain grant from NJDEP and eventually by Rutgers to secure grants to develop RSWMP and begin implementation in the watershed. Creek onto 303(d) list.
  - b. Presentations to educate towns and inspire them into action.
  - c. Water Quality Status Report – to stakeholders, to educate and inspire them into action.
  
2. **Biological data: (Tier A)** – used in educational programs at schools and community events.
  
3. **Stream visual assessments: (Tier B)** – used for stewardship of the stream and restoration grant.

# Pompeston Creek Watershed

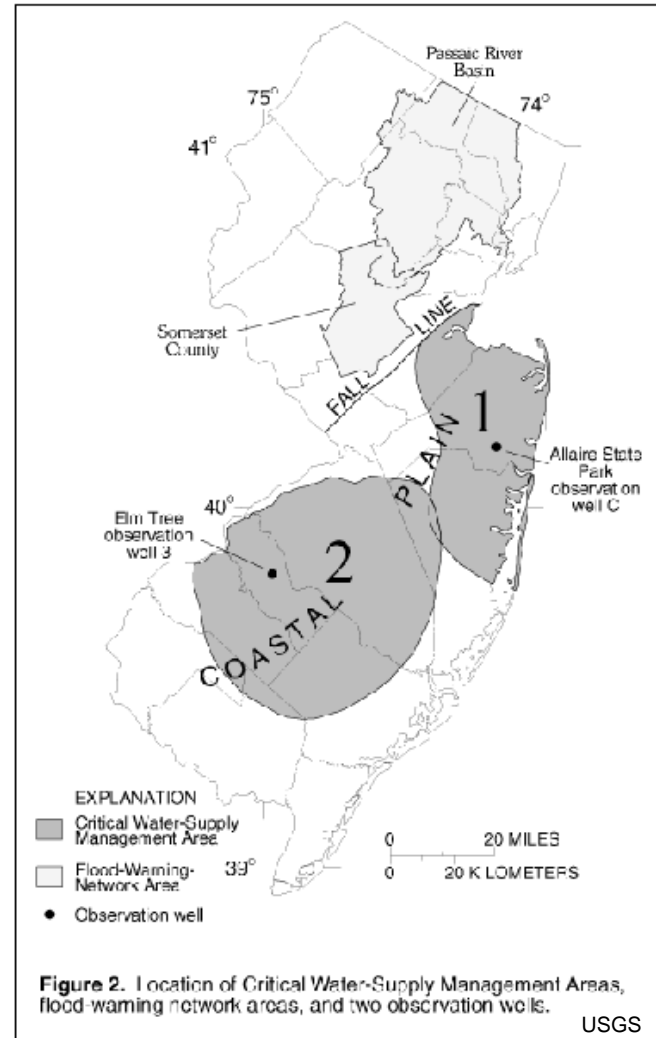
- 9 sq. miles
- 4 Municipalities:  
Moorestown,  
Cinnaminson,  
Delran, and  
Riverton
- Flows into  
Delaware River  
near NJAW Co  
water intake



# Geology and Water Supply



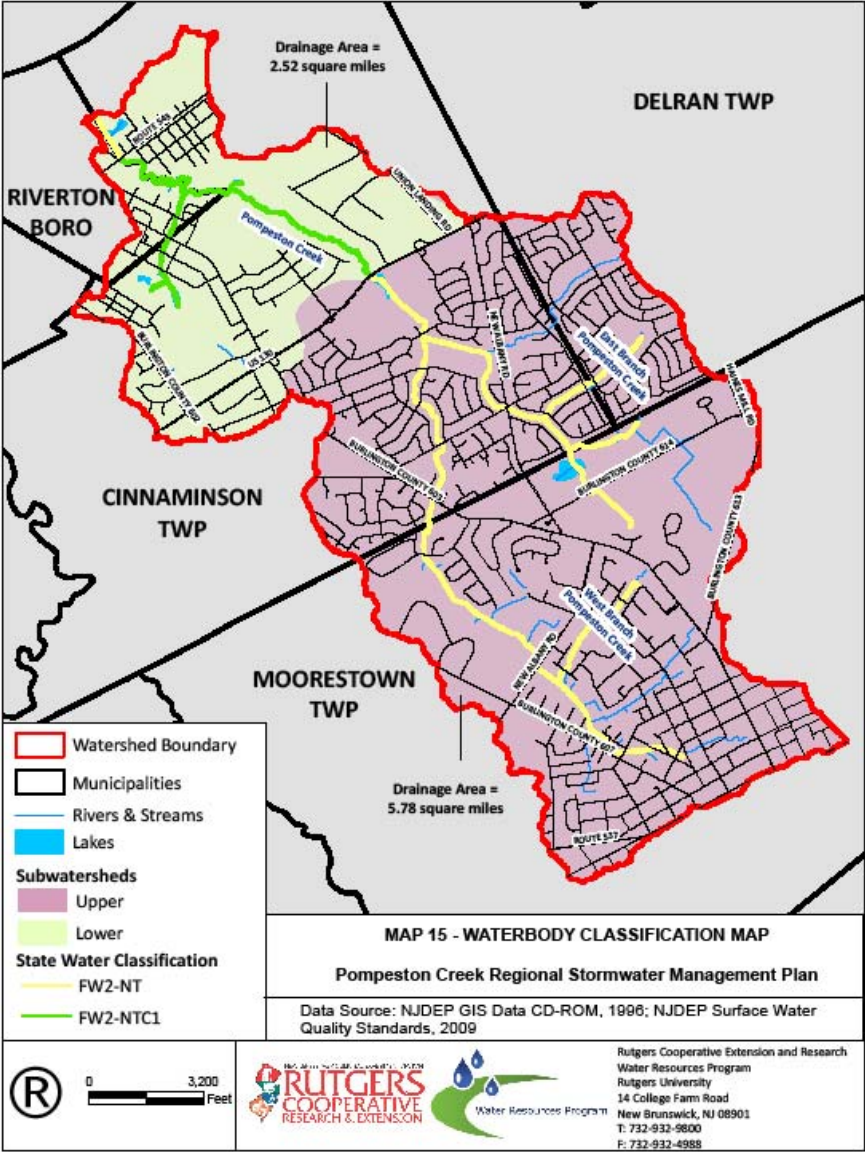
Good infiltration (aquifer recharge) in most of Cinnaminson.



Cinnaminson in Critical Water Supply Area #2.



# Category One Protection for Tidal Marsh

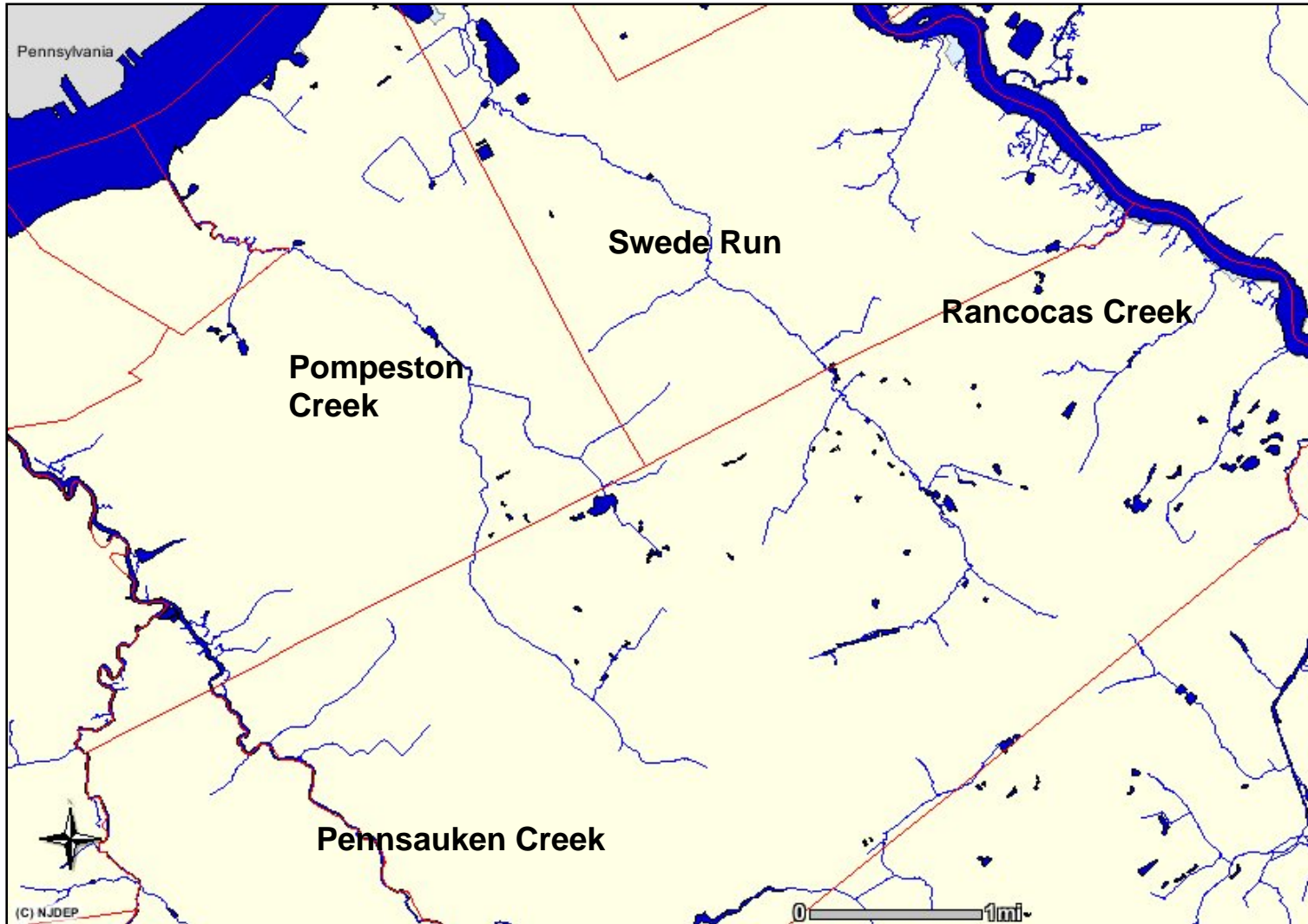


Eastern Pond Mussel



Tidal Marsh of Pompeston Creek in Riverton and Cinnaminson

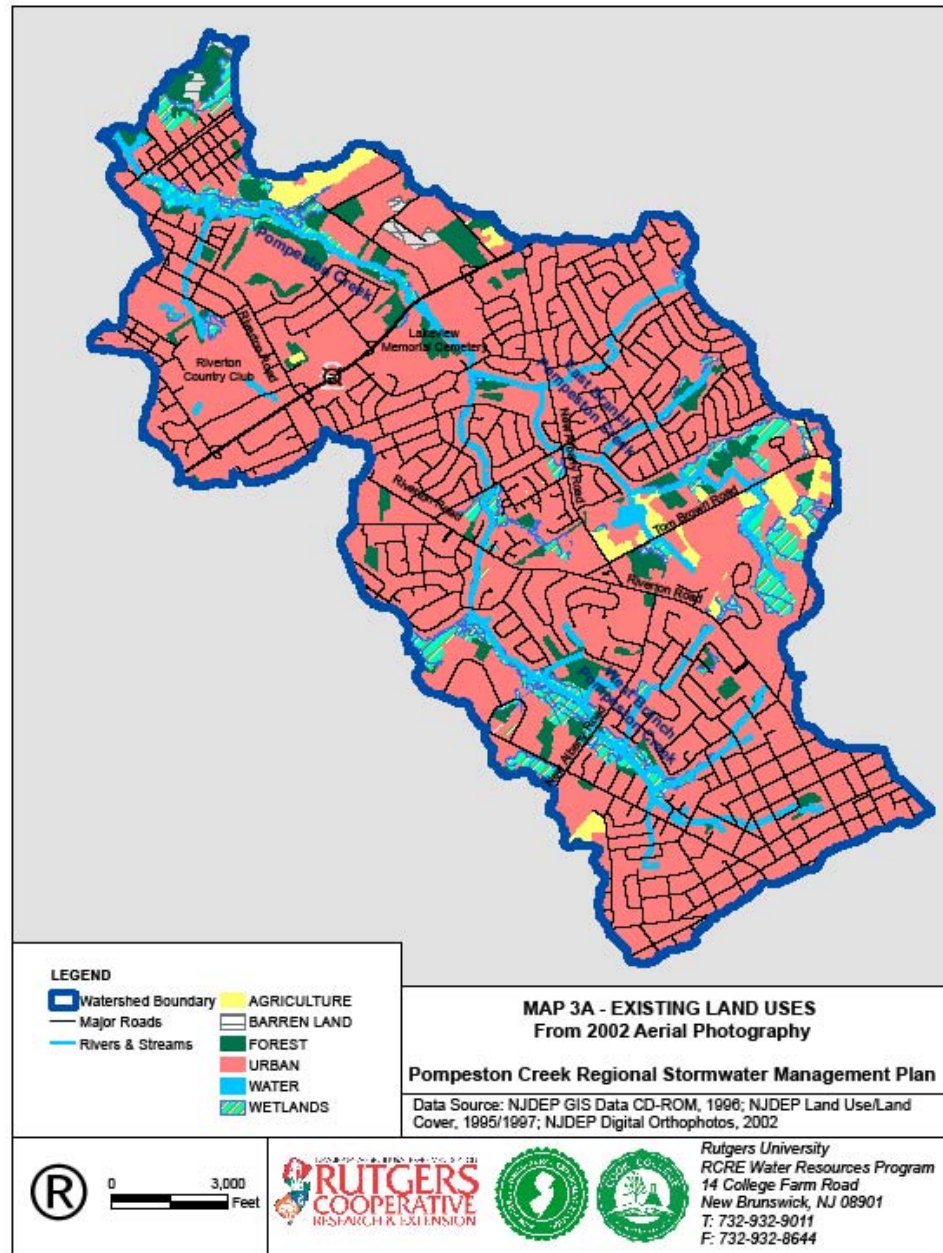
# Streams in the Watershed Towns



Pompeston Creek, Pennsauken Creek, Swede Run, and Rancocas Creek –  
similarly impaired



**Land Use in the  
Watershed:  
  
80% Urban**



# Problems in the Watershed

- More than 200 stormwater outfalls into the creek
- Stormwater runoff is polluted
- Erosion from stormwater flows
- Sediment from streambank erosion and construction sites smothers habitat
- Flooding from excessive impervious cover and runoff
- Sanitary sewers run along and through the creek; sometimes break, leak, or back up during floods
- Pet and other animal waste
- Fertilizers (and pesticides)
- TRASH

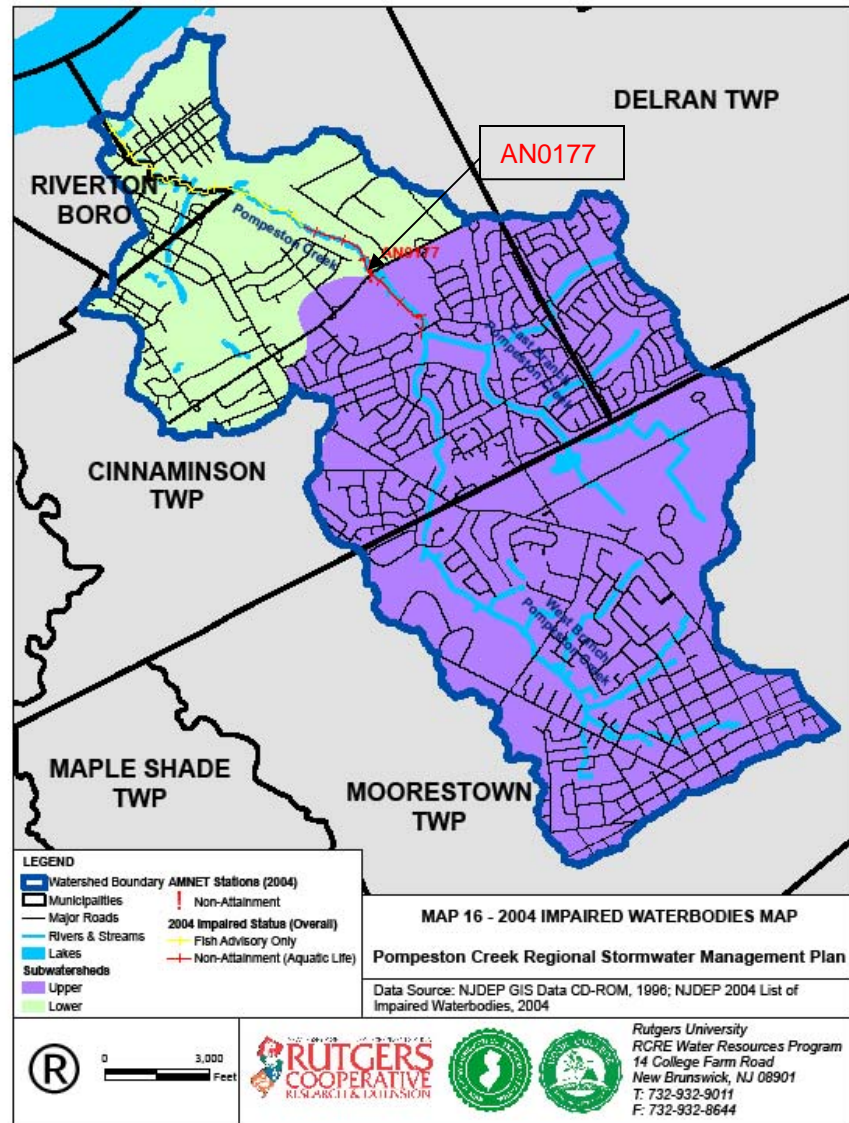




# Water Quality in Pompeston Creek

NJDEP ranks Pompeston Creek as **moderately to severely impaired** for aquatic health by stream macroinvertebrate assessment.

NJDEP does **no** chemical or bacterial monitoring in the Pompeston Creek.

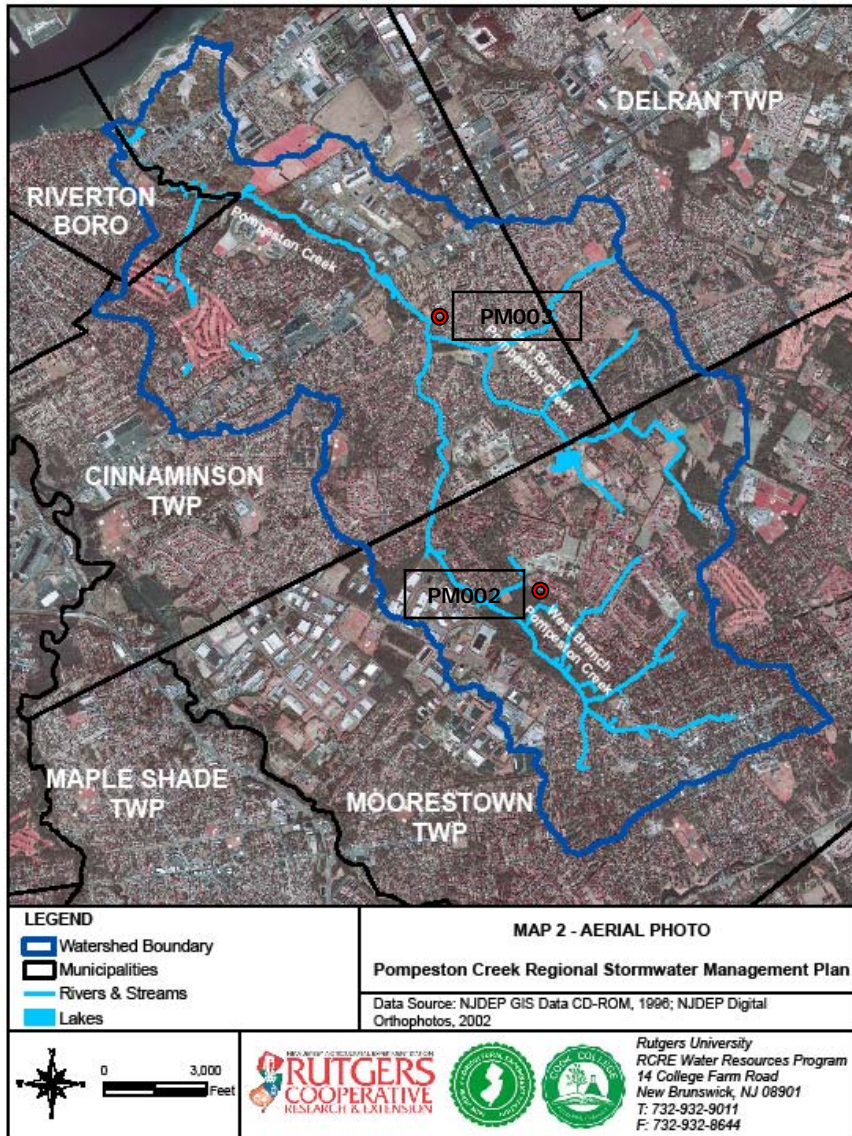


## Evolution of PCWA's Volunteer Water Quality Monitoring Program

- Began in 1998, West Branch in Moorestown, PM002 – Is water clean enough for cub scouts to do stream cleanup?
- **Monthly:** analyzed Fecal Coliform, pH, T, Dissolved Oxygen, Nitrate, and Phosphate
- From July 2001 – January 2003, Fecal Coliform exceeded Surface Water Quality Criteria in 74% of samples
- TWIG grant: 2003 added new site in Cinnaminson, PM003
- 2004 developed an NJDEP-approved Quality Assurance Project Plan – Data now accepted by NJDEP
- 2004 – 2008, analyzed Fecal Coliform, *E. coli*, Phosphorus, Nitrate-N, and Total Suspended Solids: Pompeston Creek on 303(d) list for *E. coli* and Phosphorus
- Currently revising Quality Assurance Project Plan again



# PCWA Water Quality Monitoring Sites



## PM002

- Located on West Branch in Moorestown
- In naturally forested park
- Began monitoring in October 1998
- Non-tidal

## PM003

- Located on main stem in Cinnaminson
- In recreational park (mowed)
- Began monitoring in September 2003
- Non-tidal

## Percent of Samples Not Meeting Surface Water Quality Criteria\*

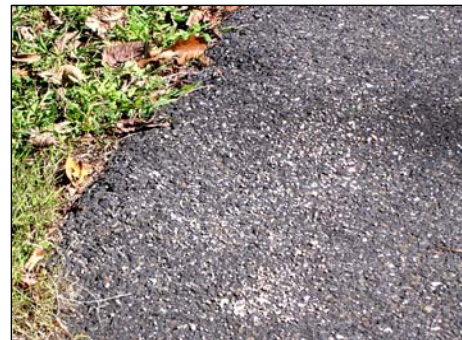
Monitoring Site ID	**Total Phosphorus	Fecal Coliform	** <i>E.coli</i>	Total Suspended Solids	Dissolved Oxygen
PM002 Moorestown	23%	50%	66%	0%	0%
PM003 Cinnaminson	34%	63%	67%	2%	14%

\*NJ Surface Water Quality Criteria are calculated for each pollutant to protect human and aquatic health as required by the Federal Clean Water Act (N.J.A.C. 7:9B-1.14).

\*\*Pompeston Creek listed on 303(d) list (NJ's Dirty Water List) for Phosphorus and *E.coli* based on these data. No TMDL required due to RSWMP Implementation.

# Phosphorus

- Phosphorus exceeded the SWQC at both sites, in Moorestown and in Cinnaminson, in 23% and 34% of the samples at each site, respectively.
- Phosphorus varied seasonally: higher in the summer than winter. High phosphorus often occurred in late summer with profuse algae (excess P causes algal blooms), low dissolved oxygen levels, and high bacteria.
- Phosphorus also was high when collected during or immediately after a storm event.
- Phosphorus was higher at Cinnaminson site than at Moorestown site.
- Sources of excess phosphorus in the watershed may be fertilizers and waste. Sources of phosphorus contamination should be investigated.





# Bacteria Source Tracking Results

- Wildlife source – all 26 samples
- Human source – 7 of 26 samples
- Domestic Animal source – 6 of 26 samples

Analyses performed by NJDEP Leeds Point Laboratory





## Bacteria in Pompeston Creek

- Fecal coliform and *E. coli* levels exceeded the SWQC frequently in Pompeston Creek at PM002 and PM003. At PM002 in Moorestown, at least 50% of the samples exceeded the SWQC for both parameters. At PM003 in Cinnaminson, more than 60% of the samples exceeded the SWQC for both parameters.
- Bacteria levels were seasonal: higher in summer than in winter.
- Sources of bacteria in the watershed include wildlife, domestic animals, and humans.

## Dissolved Oxygen in Pompeston Creek

- DO is temperature dependent
- DO values violated the SWQC (**dropping below the minimum criteria** of 4.0 mg/L) only at PM003 in Cinnaminson, in 14% of the samples.
- These low values occurred every year between May and September and occurred with elevated phosphorus and bacteria concentrations.
- Excess nutrients from waste and fertilizers, decomposition of algae, and bacteria all consume DO in the creek.
- High summer stream temperatures (excessive due to hot pavement and lack of stream buffers) also negatively affect DO.
- These low DO values are extremely unhealthy for aquatic life.



# Significant Findings

- Total Phosphorus, *E. coli*, Fecal Coliform and DO violated SWQC.
- Bacteria levels appear to have increased from 1998 – 2008.
- Phosphorus and DO levels appear to have worsened in Cinnaminson from 2003 – 2008.
- Sources of excess phosphorus include waste and fertilizer.
- Sources of excess bacteria include animal and sometimes human waste.
- Low DO values are caused by excess phosphorus and bacteria, decomposition of profuse algae, and high stream temperatures.
- Trash is a serious problem in the creek.
- These problems are unhealthy for aquatic life and people – especially children – and increase costs of water treatment.

# How We All Can Help

- REDUCE, REUSE, RECYCLE!
- Adopt your storm drain, keep it free of trash, especially bottles and styrofoam.
- Pick up and PROPERLY DISPOSE OF dog waste.
- Plant native plants at your home.
  - Use NO fertilizer or No-Phosphorus fertilizer
  - DON'T use pesticides
- Keep grass clippings and leaves away from storm drains and streams.
- Allow sump pump discharge and roof drainage to flow overland if possible.
- Wash your car at a CAR WASH that recycles the water.
- USE STORMWATER for irrigation or infiltration (rain barrels and rain gardens).
- Work with your local government to pass protective ordinances and ENFORCE current ordinances.
- Call in Sediment or Pollution violations to DEP (877) WARN-DEP.
- Join PCWA, support our programs for healthy water! 609-760-3223 or [www.pompestoncreek.org](http://www.pompestoncreek.org)



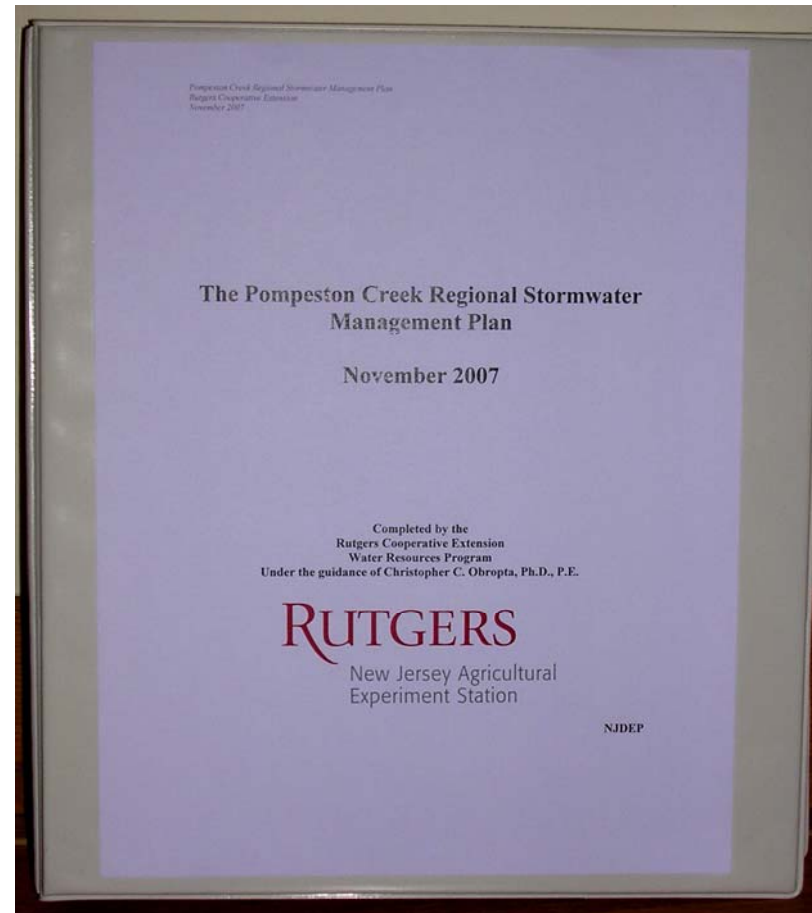
# Recommendations for the Towns

- Residents, especially children, should be discouraged from wading/swimming in the stream in summer when bacteria levels are likely to be high--during and just after storms; on hot days when algae is growing profusely in the stream; and when the stream is not flowing well.
- The municipalities should perform video scopes of the sanitary sewers to identify leaks, breaks, and illicit connections, and repair these immediately.
- The municipalities should install grates on older storm sewer catch basins to keep dog waste bags and other trash out of the creek.
- The municipalities should pass a **No- or Low-Phosphorus ordinance**.
- The municipalities should encourage redevelopment without increasing impervious cover rather than new development where possible.
- The municipalities should disconnect impervious surfaces where possible: route roof and parking lot runoff to rain gardens or infiltrations beds; use pervious pavement in parking lots.
- Riparian zones of 50, 150, or 300 feet widths, as described in the Flood Hazard Rules, the NJ Stormwater Management Rules, and the Freshwater Wetlands Protection Act rules should be enforced and/or created.
- Any Planning or Zoning Board approval of an application that includes environmentally sensitive areas should have a deed restriction, fencing, and signage to delineate and protect these areas.
- The municipalities should enact ordinances and recommendations in the Pompeston Creek Regional Stormwater Management Plan (RSWMP).

# Pompeston Creek Regional Stormwater Management Plan

Developed by RCE Water Resources Program in partnership with PCWA and the four municipalities, from 2004 - 2007.

Provides excellent information, guidance, and recommendations for achieving a healthier Pompeston Creek.

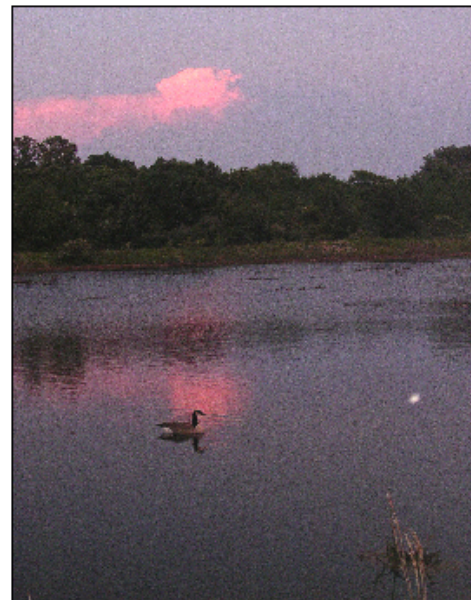
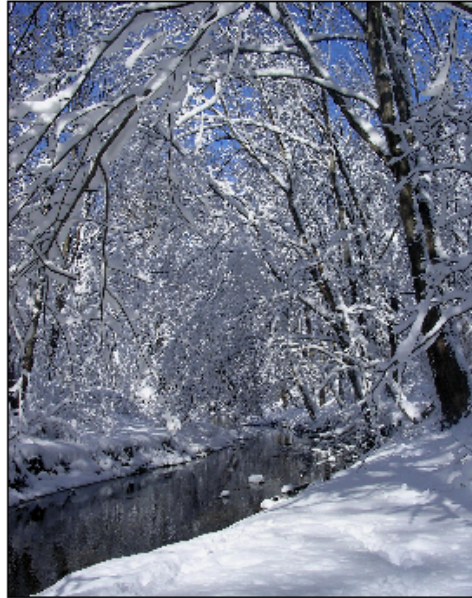


<http://www.water.rutgers.edu/Projects/Pompeston/Pompeston.htm>

# Next Steps—Saving Taxpayer Dollars:

- RSWMP was approved by NJDEP as a Watershed Restoration Plan.
- Because of PCWA's approved water quality monitoring program/data and the official Watershed Restoration Plan, Pompeston Creek watershed is recognized as a priority area.
- Rutgers received \$1,000,000 for implementation projects in Delran, Moorestown, and Riverton.
- PCWA and three Municipalities are partnering in these projects:
  - Infiltrating runoff: vegetated bioretention swales
  - infiltrating planter boxes in municipal lots
  - detention basin retrofits
  - Address flooding issue in Delran
  - Bacterial source ID (locating septics, sewers, animal facilities)
  - Restoration of channelized area of stream in Pompeston Park
- PCWA continues its volunteer Monitoring, Restoration/Cleanup, and Education Programs.

# The Status of Pompeston Creek from 1998 - 2008: A Water Quality Monitoring Report



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# **Special thanks to our dedicated volunteers and our outstanding partners:**

- PCWA Members and Business Sponsors
- Rutgers Cooperative Extension, Water Resources Program
- The Watershed Institute
- NJDEP Division of Watershed Management
- NJDEP Water Monitoring and Standards
- Moorestown Environmental Advisory Committee
- Riverton Borough, Moorestown, and Delran Townships
- Burlington Co. Dept. of Resource Conservation

*Thank You!*  
*We do it for them...*



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