



The Basin Bulletin

Newsletter of the Raritan River Basin Raritan Basin Watershed Alliance Summer 2008, Issue #18

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The Raritan Plan: Four Years Later Loss of Ground Water Recharge Dan Van Abs, NJ Highlands Council (formerly NJWSA)

As noted in the Basin Bulletin, Spring 2007, the Raritan Basin Watershed Management Plan (www.raritanbasin.org) was released to the public in early 2003. That article discussed the six key environmental issues and the resulting stakeholder vision for the basin. In the Summer 2007 edition, we addressed surface water quality, and a Fall 2007 article addressed loss of riparian areas. In this article, we focus on another of the six key issues: loss of ground water recharge. As described in the Raritan Plan:

“The Raritan Project assessed ground water recharge rates in 1986 and 1995. The assessment results were startling – one of the biggest surprises in the project. Two subwatersheds showed estimated losses of over 20 percent in just 10 years, and many others showed losses between 15 and 20 percent. These losses can harm stream flows and aquifer stability.”

What did the Raritan Plan propose to address this issue? What has happened since 2003 to implement these ideas?

Implementation Strategies

The Raritan Plan includes both basin-wide and watershed management area strategies to address the six key issues. Seven of the eight Basin Strategies relate to the protection of ground water recharge, reflecting the importance of this issue and its connection to stormwater management. The Strategies recommend:

- a “Lands for Water” initiative based on mapping of lands that are critical to the quality and quantity of Basin ground and surface water resources (RB-S1);
- adoption of land use provisions in municipal master plans and ordinances requiring that developments preserve critical areas for water resource protection (RB-S2);
- developing an integrated water budget system

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Statewide & Regulatory Updates

DEP Taking Steps to Reduce Impacts of Phosphorus on Waterways

Ken Klipstein, Director

Watershed Protection Programs, NJWSA

In April, NJDEP Commissioner Lisa P. Jackson announced the Department of Environmental Protection is taking significant steps toward improving the health of New Jersey's lakes, rivers and streams by reducing the impacts of phosphorus, a nutrient that degrades water quality.

During an Earth Week event at a West Windsor home-improvement center, Commissioner Jackson signed a memorandum of understanding with members of the lawn-care industry, who pledged to achieve a 50 percent reduction in pounds of phosphorus applied in lawn care products in New Jersey Watersheds by 2010 as compared to a 2006 base year. These Manufacturers will self-report to the New Jersey Department of Environmental Protection's Division of Watershed Management at the end of each calendar year after 2008 the pounds of phosphorus sold at the retail level in the state as the measure of achievement of this commitment. Each manufacturer shall decide how it will achieve this goal.

The three manufacturers of Do-It-Yourself lawn care products (Scotts, United Industry and Lebanon Seaboard) have agreed to make no phosphorus or reduced phosphorus fertilizers available to retail centers across the state. The manufacturers have also agreed to conduct public education programs on proper use of fertilizers and will label products accordingly. In signing the memorandum of agreement, the parties agreed to establish technical groups to work with the DEP, The New Jersey Water Supply Authority and Rutgers University's Agricultural Experiment Station in developing a stewardship program to foster better public education and to review strategies to reduce the levels of phosphorus in fertilizers.

There are approximately 80 million home lawns in the United States covering some 30 million acres. With over 1 million bags of fertilizer sold in New Jersey each year, a 50% reduction in phosphorus sold should translate into a significant decrease in the amount of nutrients entering our waterways.

Nutrients such as phosphorus are essential to plants and animals, but too much fosters excessive algae growth, impairing water quality, diminishing recreational experiences, making treatment of drinking water more costly, and depriving water of dissolved oxy-

gen that fish and other aquatic life need.

DEP to Implement Updated Water Quality Management Planning Rules

Ken Klipstein, NJWSA

The DEP approved amended Water Quality Management Planning Rules that will take effect in July. Under the new rules Counties will assume the role of lead agency for the development and maintenance of Wastewater Management Plans. Each municipality will be an independent chapter under the plan. The counties will have 9 months from the July adoption date to submit an updated plan and municipalities may apply for assignment of responsibility if their county fails to act. Failure to produce a wastewater management plan within 9 months or failure to maintain a 6-year update of the plan will result in the withdrawal of all sewer service area except where collection systems exist. The main objectives of the rule update are to 1) Get sewers service to the appropriate locations; 2) Apply consistent build out analysis and density standards; and 3) Address Nonpoint Source Pollution Impacts (riparian corridor protection, steep slope protection, TMDL special measures). The New Jersey Water Supply Authority under a grant from NJDEP developed the COUNTY WASTEWATER MANAGEMENT PLAN TEMPLATE to help guide the counties in establishing the new plans. The template can be found at: <http://www.nj.gov/dep/watershedmgt/>. Somerset County is one of the first to begin using the template and is a pilot county working closely with DEP to develop a Wastewater Management Plan that complies with the new rules.

New NJDP Fact Sheet on Category One Buffers

Buffers are vegetated areas adjacent to waterways that provide protection to New Jersey's water quality. These special areas are established and protected through various rules and may vary in width. A 300 foot or Category One (C1) buffer is required by the Stormwater Management (NJAC 7:8) and the Flood Hazard Area Control Act rules (FHACA) at NJAC 7:13, for certain activities proposed adjacent to waters designated in the Surface Water Quality Standards (NJAC 7:9B) as C1 or their upstream tributaries in the same sub-watershed (HUC 14).

NJDEP recently published a factsheet (http://www.state.nj.us/dep/wms/bwqsa/BUFFER_Fact_Sheet_2.pdf) that discusses the relationship among these various rules and the impact on the Category One buffer.

Statewide & Regulatory Updates (continued)



South River, Sayreville Borough

DEP Formally Adopts Total Maximum Daily Loads Addressing Phosphorus Impairments in Passaic Basin

Ken Klipstein, NJWSA

On April 24, 2008 Commissioner Jackson formally signed off on science-based standards that will greatly reduce phosphorus discharged as wastewater and stormwater in two heavily developed watersheds in northeastern New Jersey, the non-tidal Passaic River Basin and the Pompton Lake/Ramapo River Watershed.

Nutrients such as phosphorus are essential to plants and animals, but too much fosters excessive algae growth, impairing water quality, diminishing recreational experiences, making treatment of drinking water more costly, and depriving water of dissolved oxygen that fish and other aquatic life need.

Algae growth has been problematic in the highly developed Passaic River and Pompton Lake-Ramapo River watersheds of northeastern New Jersey.

The DEP formally adopted water-quality criteria for this basin based on the amount of phosphorus the river systems can naturally assimilate. The criteria, known as total maximum daily loads, affect more than 50 sewage treatment plants and imposes additional non point source measures on municipalities in the basin. The full TMDL Reports can be reviewed on line at <http://www.nj.gov/dep/watershedmgt/tmdl.htm>.

Raritan River Basin TMDL Study

Todd Kratzer, NJWSA

The NJDEP, through the Rutgers New Jersey EcoComplex, has contracted with Omni Environmental, LLC for the development of a technical basis to address phosphorus and other water quality impairments in the Raritan River Basin. Water quality data, including total and ortho-phosphorus, dissolved oxygen, pH, and total suspended solids, were collected by Omni during 2004 and 2005 for calibrating the WASP (Water Quality Analysis Simulation Program) model to simulate the affects of various total phosphorus loading reduction scenarios on existing ambient pH and dissolved oxygen.

Phosphorus is a nutrient that can stimulate the growth of aquatic plants. In turn, aquatic plants can influence the extent of daily in-stream pH and dissolved oxygen variability resulting from photosynthesis and respiration. On May 1, 2008, at the NJWEA Annual Conference, and previously at the December TAC Meeting, Omni presented results of their model simulations to demonstrate what point and nonpoint source requirements would be needed at various locations throughout the Basin to satisfy NJ's Surface Water Quality Standards. Simulations were run under existing conditions, with various load-reduction scenarios of urban and agriculture land uses, and under natural conditions. Results of the modeling effort are being reviewed for the final report, including the establishment of point and nonpoint loading capacities. A data summary and past presentations are available at: <http://www.omnienvironmental.com/>. Click onto Resources and scroll down to Raritan River Basin Nutrient TMDL Study.



Ambrose Brook, Middlesex Borough

Manalapan Brook Watershed Restoration Plan
Kathy Hale, NJWSA
Mirah Becker, Middlesex County Department of Planning
Fred Lubnow, Princeton Hydro, LLC



In 2004, the New Jersey Water Supply Authority (NJWSA), in partnership with the Middlesex County Department of Planning, began development of a Restoration / Implementation Plan for Manalapan Lake and its watershed to comply with the New Jersey Department of Environmental Protection's (NJDEP) targeted 86% reduction of the annual total phosphorus (TP) load entering Manalapan Lake, as per the established Total Maximum Daily Load (TMDL) (NJDEP, 2003). As part of this plan, selected water quality and ecological data were collected on Manalapan Lake to determine if the TMDL's modeled TP concentrations reasonably agree with existing in-lake concentrations. While the Manalapan Lake dataset was limited in size and scope (five sampling events over the course of 2004 and 2005), existing TP concentrations diverged significantly from modeled concentrations. Since the in-lake TP concentrations were below the State's water quality criteria threshold for TP, it was decided to re-examine the potential suitability of a TMDL for TP in Manalapan Lake.

The project consultant, Princeton Hydro presented the following interim conclusions to NJWSA and NJDEP:

1. In the case of Manalapan Lake and its watershed, the total phosphorus TMDL approach is not the most appropriate means of restoring and managing these ecosystems.
2. The pollutant of primary concern for the Manalapan Lake watershed should be total suspended solids (TSS), not TP.
3. A watershed-based, stream assessment approach should be taken to develop a Watershed Protection & Restoration Plan for the Manalapan

NJWSA recently expanded the project to the entire Manalapan Brook Watershed with funding obtained by Middlesex County Freeholder Camille Fernicola through NJDEP's Section 319(h) Nonpoint Source Grant Program. Using a combination of stream visual assessment, water quality sampling and land use modeling, locations for stream restoration projects and best management practice implementation will be identified. In addition, a demonstration project will be implemented during 2009. Construction plans will be developed for an additional five projects. The first project committee meeting was held in June. If you have questions regarding the project, or to be added to the project mailing list, contact Tara Petti, NJWSA (tpetti@raritanbasin.org).

Tewksbury Named Tree City
Teddy Murphy, Chair, Tewksbury Township Forestry Advisory Board

The preservation of tree stands and woodlands is important to preserve the purity and abundance of water courses in the Raritan River Basin. Trees help to stabilize the stream banks, prevent erosion, and shade the streams so that the water remains cool enough for the invertebrates that nourish the fish in the streams to survive.

In 2003 Tewksbury commissioned an inventory of its forest resources on public lands and prepared a Woodland Management Plan for the Township to implement. Subsequently the Township passed a tree clearing ordinance and mandated its Environmental Commission to implement the Woodland Management Plan. Realizing that the implementation needed a separate group to do justice to the Plan, the Township created a Forestry Advisory Board. The Board's five members represent the Environmental and Scenic Roads commissions, the Parks Committee, and the public at large (2 persons).

The Board had worked steadily with the New Jersey Division of Parks Forestry and its Community Forestry program. In 2007 Tewksbury qualified to become a Tree City, only one of two in Hunterdon County. Tewksbury will be the site of the State's celebration of Arbor Day in 2009.

Members of the Tewksbury Township Environmental Commission are working with the NJ Water Supply Authority in its assessment of the health of the streams that contribute to the network of water courses that drain to the Hunterdon County reservoirs. At least one of these participants is a member of the Forestry Advisory Board.



Rain Gardens Infiltrate Morris County
John Malay, Raritan Highlands Compact

Did you know that you can use your gardening skills to enhance your landscaping and improve water quality? You can with a rain garden.

Rain gardens are slightly sunken planting beds designed to hold and treat stormwater runoff from rooftops, driveways and other impervious areas. Rain gardens are an inexpensive, aesthetically-pleasing method of treating and infiltrating stormwater from impervious areas. They can be created with a minimum of excavation, fill and planting. If you can create a new flower garden, you can create a rain garden.

Rain gardens are a simple solution to runoff pollution. They can take stormwater out of the pipe and allow it to infiltrate slowly through the soil and back into the subsurface groundwater aquifers. During infiltration many biological processes take place to remove pollutants from the water. For example, plants in the garden will draw up some of the excess nutrients from lawn fertilizers and microbial action in the soil will remove and break down petroleum products from roofs, driveways and other asphalt surfaces.

Rain gardens are inexpensive, attractive, and easy to install. Homeowners, business owners and government facilities can use rain gardens to minimize the land use impacts to streams. One small 300 square foot (10 ft. x 30 ft.) rain garden has the potential to treat 25,000 gallons of runoff per year, runoff that might otherwise flow directly into catch basins, culverts or other stormwater infrastructure and immediately end up in the river or stream. Diverting the water back into the ground recharges the aquifer and reduces flooding downstream.

The Raritan Highlands Compact is working on a pilot project to introduce rain gardens to upper Raritan River watershed residents. The Compact is providing funding and technical support to community groups and volunteers to construct demonstration rain gardens. So far five projects have been completed:

- Washington Township (Morris County) Public Library
- The Highlands Council Headquarters (Chester Township)

- Chester Public Library (Chester Township)
- Mendham Township Elementary School and Mountainview Elementary School (Mendham Borough)

We are looking for at least five additional sites that can be used to educate others about this low-tech solution to runoff pollution. To qualify, sites must be:

- Located within the Raritan Highlands Compact area (portions of The Chesters, The Mendhams, Mt. Arlington, Mt. Olive, Randolph, Roxbury or Washington Township),
- Located on public property and
- Adopted by a local community group who can help install and maintain the rain garden.

The Raritan Highlands Compact will provide garden design, landscaping, sign and educational materials, as well as public recognition for your efforts to protect water quality in the form of press releases as well as photos and a description on our website!

Please contact John Malay at the Raritan Highlands Compact 908.419.4264 or at info@raritanhighlands.org for more information.

The Raritan Highlands Compact is a nonprofit organization led by a consortium of nine Morris County municipalities working together to improve water resources in the Upper Raritan River Watershed. Morris County also provides leadership and technical support to the organization. The Upper Raritan watershed includes portions of Chester Township, Chester Borough, Mendham Borough, Mendham Township, Mount Arlington, Mount Olive, Randolph, Roxbury and Washington Township.

Funding for the rain garden project was provided by the Leavens Foundation, New Jersey Corporate Wetland Restoration Partnership, Morris County Municipal Utilities Authority, and the Garden Club of Somerset Hills.



River-Friendly Peaches

Abigail Jones, North Jersey Resource Conservation & Development Council



Recently, Tradition Farms in Pattenburg, Hunterdon County became certified as a River-Friendly Farm. Owner/operator Ken Ravenburg earned the designation by farming in a way that keeps the rivers clean and healthy. In a salute to his dedication to conservation, Ravenburg received a plaque and a sign at the North Jersey Commercial Fruit Growers Association meeting from North Jersey Resource Conservation & Development Council (RC&D) located in Clinton which sponsors the voluntary River-Friendly Certification Program. The preserved 40-acre farm on County Route 614 has 17 varieties of peaches and 30 varieties of apples for sale during the year at the roadside store. Ravenburg also grows tomatoes, pumpkins and other vegetables.

"We keep as much as we can in grass," said Ravenburg, who now operates the farm he grew up on. "When it rains, any runoff comes out clear. No sediment."

Through the River-Friendly Farm Program, farmers like Ravenburg are getting recognition for being good stewards of the land and protecting our water resources which provide drinking water to millions of people. Ravenburg and other River-Friendly farms do all of the following: reduce soil erosion so sediment does not enter waterways; reduce fertilizer to minimum amounts needed to prevent leaching into water; provide essential vegetative habitat along water bodies to help protect aquatic organisms; and apply pesticides and other control methods as appropriate. Free technical assistance is provided through the River-Friendly Farm certification process for producers to implement best management practices that protect water quality and enhance efficiencies on-farm.

"When we were planting this field [on the north side], we noticed that nature had a waterway already," Ravenburg remarked. "It wasn't very straight, but it was working well before we got here. We decided to leave it, and it's working well for us."



Tradition Farms has a tasty range of fresh produce grown on location. The farm stand usually opens the beginning of July, "depending on the weather," says Ravenburg. Juicy peaches in summer along with green beans and greenhouse tomatoes give way to a myriad of fresh apples and squash in fall. His Indian corn, corn stalks, decorative gourds and straw bales enhance fall decor. The cheese pumpkins and blue Hubbard squash are a must for perfect pumpkin pie. And don't forget the fresh apple cider.

In 1995, Ravenburg worked with the Natural Resources Conservation Service on 3 stream restoration and bank stabilization projects on his property. Once that was finished, he continued work on his own to improve other reaches of the stream on his property. "Every year I just plant a little bit more," Ravenburg said. Part of that work includes a nursery bank of willows that can be harvested and used in other stream restoration projects in other locations.

RIVER-FRIENDLY
FARM



The River-Friendly Farm program recognizes producers throughout the Raritan Basin which includes parts of Morris, Hunterdon, Somerset, Middlesex, Union, Mercer, and Monmouth counties. North Jersey RC&D is seeking applicants and is available to speak with any interested group or individual about the program. Please contact Abigail Jones at 908-735-0733 x102 or ajones@northjerseyrcd.org. Applications and further information can be found on the River-Friendly website at www.njriverfriendlyfarm.org.

The North Jersey RC&D serves and is sponsored by the Freeholders and Soil Conservation Districts of Hunterdon, Morris, Somerset, Sussex, Warren and Union Counties. Through partnerships with municipal, state and federal agencies, as well as many private entities, the Council develops and manages programs and projects that promote the improvement and wise use of the region's human and natural resources.



**Dvoor Farm Stream Restoration
Initial Phases of Construction to Commence**
Grace Messinger, Watershed Specialist, North Jersey Resource Conservation & Development Council

Within a few weeks restoration activities will be occurring along the Walnut Brook off Old Croton Road in Raritan Township Hunterdon County on the Hunterdon Land Trust owned property, known as the Dvoor Farm. The initial activity will involve the delivery of rocks and mulch that will be used over the next several months.

North Jersey Resource Conservation and Development (RC&D) Council in partnership with the Hunterdon Land Trust will be leading the effort to construct two acres of wetland habitat, stabilize two severely eroding sections of streambank along Walnut Brook, and re-establish a healthy and functioning riparian buffer habitat.

The majority of the construction activity proposed is slated to begin in August and continue through October to create the wetland habitat and to stabilize the eroding streambanks in Walnut Brook. The planting of additional trees and shrubs will continue through spring 2009.

The Project Team has tentatively set the week of October 13th for the construction of the streambank stabilization areas along Walnut Brook. This work will start in a section of the stream as it flows through Mine Brook Park onto the Dvoor Farm property, initial work will include establishing a stream-side buffer. Volunteers will be needed to help plant trees and shrubs for the establishment of the buffer. If you are interested in volunteering please contact Grace Messinger, North Jersey RC&D Watershed Specialist at 908-735-0733 ext 110 or gmessinger@northjerseyrcd.org

Over the last several months cooperative efforts between several environmental organizations have worked to design this project. Some of the goals of the project are to restore and enhance the riparian area on the property, reduce the erosion in the stream and create forested wetlands on the Dvoor Farm property. Project partners include North Jersey RC&D, Hunterdon Land Trust, Raritan Township, Natural Resources Conservation Service, Hunterdon County Board of Freeholders, Hunterdon County Soil Conservation District, Princeton Hydro LLC, South Branch Watershed Association, NJ Water Supply Authority, Trout Unlimited and the NJ Department of Environmental Protection Division of Watershed Management and Division of Fish and Wildlife.

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CONTACTS:

Project Lead: Grace Messinger, North Jersey RC&D, 908-735-0733 ext 110
Dvoor Farm Manager: Catherine Suttle, Hunterdon Land Trust, 908-237-4582



Raritan-Piedmont Wildlife Habitat Partnership Organizations Receive Funding

Conservation Resources Inc. (CRI) www.conservationresourcesinc.org recently announced the funding of \$600,000 for land acquisition and restoration projects to organizations involved in the Raritan-Piedmont Wildlife Habitat Partnership (RPWHP). The projects will benefit grassland birds and are located in Somerset and Hunterdon County, covering over 1,000 acres. At a recent quarterly meeting of the Raritan-Piedmont Wildlife Habitat Partnership held at Duke Farms, Conservation Resources announced the expenditure from a grant received from the Doris Duke Charitable Foundation. The grants will be awarded to nonprofit organizations to match funds from their state and local government partners for land acquisition as well as for restoration projects.

“The projects are all essential to the immediate implementation of the Grassland Conservation Plan” said Michael Catania, President of Conservation Resources Inc. “The Grassland Plan prepared last year by RPWHP identified numerous parcels in this Central Piedmont Plains whose protection or management could substantially enhance grassland bird habitat www.nj Audubon.org/Conservation/Regionalplanning.html#Raritan. Conservation of this region for declining grassland bird populations was highlighted in the recently completed New Jersey Wildlife Action Plan”. www.nj.gov/dep/fgw/ensp/waphome.htm

Conservation Resources Inc. approved funding for the preservation of 1 property and restoration of 3 properties. The funding is contingent upon matching funds and the execution of a contract for the land acquisition project. The funded grassland projects include:

- Higgins – Preservation of a 655-acre priority parcel spanning Hunterdon and Somerset Counties. Restoration of some old fields and farmland on this key tract was initiated in the summer of 2007, enhancing the properties use by at risk grassland bird species. New Jersey Conservation Foundation is leading the effort to acquire this key property and will be seeking matching funds from additional private as well as public partners. www.njconservation.org
- Otto Park Farm – Restoration of 36 acres on this park owned and management by Hillsborough Township. Conserve Wildlife Foundation will spearhead this project in coordination with a local Township farmer and Hillsborough Township. www.conservewildlifenj.org
- South Branch Wildlife Management Area – Restoration of 226 acres of this property, locally known as the “Merck Tract” and owned by the New Jersey Division of Fish and Wildlife. New Jersey Audubon Society working with the various state and local partners developed a management plan for this cornerstone tract to restore grassland bird habitat over a number of years, in order to maximize the use of the property for farming and grassland birds. NJAS and NJ Fish and Wildlife, working with the tenant farmer initiated the first phase of this long-term restoration project in the summer of 2007. www.nj Audubon.org, www.nj.gov/dep/fgw
- Six-Mile Run – Restoration of 117 acres of this larger property of over 3,000 acres owned by the New Jersey Division of Parks and Forestry. This project is a continuation of New Jersey Audubon Society's efforts with the State and local landowners and Franklin Township to restore grassland habitat at this property. www.nj Audubon.org, www.nj.gov/dep/parksandforests

The Raritan-Piedmont Wildlife Habitat Partnership www.conservationresourcesinc.org/rpwhp.htm was created in 2006 by a variety of public and private organizations interested in implementing the New Jersey Wildlife Action Plan (SWAP) in the Piedmont Plains of New Jersey. Historically, Somerset and Hunterdon Counties of New Jersey has provided exemplary habitat for grassland bird species as recognized in the SWAP. In recent years, their numbers have declined in large part due to the loss of habitat. To stem this loss, the RPWHP, under the leadership of the New Jersey Audubon Society, developed a scientifically based and spatially explicit plan for grassland habitat conservation – RPWHP Grassland Conservation Plan. The establishment of the Partnership and the development of the plan were both supported by a generous grant by the Doris Duke Charitable Foundation in 1995. An additional grant to implement the RPWHP Grassland Conservation Plan was awarded to Conservation Resources Inc. in October of 2006.

As one of the founding organizations of RPWHP, the role of Conservation Resources Inc. has been to identify and secure resources for projects undertaken by RPWHP partners. In the fall of 2006, the Doris Duke Charitable

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Raritan-Piedmont Wildlife Habitat Partnership *(Continued from page 8)*

table Foundation awarded Conservation Resources Inc. a grant of nearly \$1 million to implement the Grassland Conservation Plan. The Doris Duke Charitable Foundation funds are available to non-profit organizations through Conservation Resources Inc. to acquire land and restore habitat in priority areas identified in the RPWHP Grassland Conservation Plan. The acquisition fund has \$650,000 available, with a requirement that projects provide a public and private match of 5:1; the restoration fund has \$100,000 available for projects on land owned by public or private conservation organizations. A second round of the remaining acquisition funds will be awarded in early 2008.



Summer Field Trips to Native Grassland Preserves

Individuals interested in visiting native grassland restoration sites are invited to Franklin Township's Negri-Nepote and Griggstown Grassland Preserves this spring for FREE field hikes lead by naturalist from New Jersey Audubon Society.

Saturday, July 19 9:00 a.m. to 11:00 a.m.—*Butterflies and birds at the Negri-Nepote Preserve* : Mid-summer is a great time to look for butterflies as well as birds at this grassland restoration site. Meet at the parking lot located at 260

Skillmans Lane.

Saturday, July 19, 12:00 p.m. to 2:00 p.m.—*Butterflies at Griggstown Native Grassland Preserve*

Meet at the parking lot located up the hill of the driveway entrance located at 1091 Canal Road--just west of the Griggstown Causeway.

No pre-registration is required and there is no cost. Bring binoculars if you have them and dress for current weather conditions. For more information contact John Loos, (732) 422-4326 and for directions visit: http://www.franklintwpnj.org/open_space.html

Mile Run Cleanup, Franklin Township, Somerset County

On Saturday morning, April 12th, over 50 volunteers turned out to participate in a cleanup of Mile Run, the stream that separates Franklin Township from the City of New Brunswick. The cleanup was the second annual event jointly sponsored by the Franklin Township Environmental Commission and the Stony Brook-Millstone Watershed Association. In addition to a number of volunteers from those two organizations, the other volunteers were there representing the Boy Scouts, the Korean American Club of Rutgers and the Environmental Club of Franklin High School. Significant help was provided by several members of the Franklin Township Department of Public Works, without whom the cleanup would not have been the success that it was. The DPW provided a front-end loader to haul debris up the steep slope from the stream to the street. Over 6,000 pounds of litter was removed in addition to two old abandoned automobiles, approximately 6 shopping carts, a satellite antenna dish and other assorted large items. Future cleanups are currently being planned and all volunteers are welcome to participate.



URWA Asks Residents to Use Care When Selecting Driveway Sealcoats

There are many pollutants, including fertilizers and motor oil, which are washed from our lawns and driveways each time it rains. These pollutants eventually enter our streams and lakes as the rainwater travels across the surface of the land.

Polycyclic aromatic hydrocarbons (PAH) are carcinogenic contaminants that are being detected in our waterways. PAH's degrade fish health and inhibit reproduction while increasing mortality in aquatic invertebrates, small critters that are used as indicators of stream health.

While PAHs originate from auto exhaust, motor oil, gasoline, tire particles, and lubricating oils, studies performed by the United States Geological Survey and other scientists have identified a previously overlooked and significant source of this contaminant – black top. People may enjoy the aesthetics of freshly sealed driveways and parking lots, but many of the products used to enhance the appearance and increase the longevity of asphalt contain 50% or more PAHs by weight.

The two primary sealcoat products available today are coal tar-pitch-based emulsions and asphalt-based emulsions. All sealants must be reapplied every two to three years as the material is worn away by vehicle tires, pedestrian traffic and weather. Studies to evaluate and compare the materials that wash off sealed and unsealed surfaces have found that coal tar sealed surfaces produce five times the amount of PAH contaminants as those treated with an asphalt-based emulsion sealant. The pollution derived from coal tar sealed surfaces was 65 times that originating from unsealed pavement.

After these studies identified coal tar based pavement sealants as a significant source of the polycyclic aromatic hydrocarbon (PAH) contamination found in stream sediments, some municipalities banned the sale and use of coal tar sealants since many alternatives are available. For now, please read labels carefully when purchasing sealcoat (or ask what type of sealant the contractor will use if you are planning to hire out the job) for driveways, parking lots, and other paved surfaces. Be sure the sealant does not contain coal-tar ingredients. This simple contribution will help to keep our streams and families healthy.

URWA Receives Merck "Champions for the Environment" Award

Invasive plants are rapidly becoming one of the nation's greatest threats to biodiversity as well as a serious economic problem (it is estimated that these plants cost the US \$142 billion annually). Invasive plants impact native plant and animal communities by displacing native vegetation and disrupting habitats as they become established and spread over time. Some 1,400 plant species are listed as invasive across the nation, and in New Jersey, 30 species have been identified as invasive. A prime example is Garlic mustard -- its white flowers are blooming in the woodlands and across New Jersey's backyards now. Unlike most invasive plants, once garlic mustard is introduced into a new location, it persists and spreads aggressively monopolizing light, moisture, nutrients, soil and space depriving wildlife of the native plants they rely on.

The Upper Raritan Watershed Association (URWA), in partnership with Friends of Hopewell Valley Open Space (FoHVOS) is spearheading an extensive program to find and remove invasive plants from several important sites in New Jersey's Highlands and Piedmont regions. This project represents New Jersey's first comprehensive effort toward invasive species management through a public-private partnership. The partnership represents a broad coalition of public and private entities, including the NJ Division of Parks & Forestry, US Department of Agriculture, NJ Native Plant Society, Mercer County, National Resource Conservation Service, Hopewell Township, Tewksbury Township, Stony Brook-Millstone Watershed Association, D&R Greenway Land Trust, NJ Audubon Society, Tewksbury Land Trust, Hopewell Valley School District and Duke Farms. These organizations are pooling their expertise and resources to recruit and train volunteers to identify and eradicate 20 emerging populations of invasive plants on both public and private lands while developing holistic stewardship programs for the sites.

URWA is delighted to announce that the project has been awarded a "Champions for the Environment" award from Merck & Company. According to Executive Director Cindy Ehrenclou, the \$8,000 grant will be used to fund the educational component of the project. At a recent meeting of URWA's Board of Trustees where she announced the grant, Ehrenclou said, "With Merck's support we will develop educational guides and have the means to reach out and

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URWA Updates (Continued from page 10)

partner with landowners who are in a position to make a difference in the battle to control invasive species. Merck's involvement is so important, as they bring a global perspective to the issue of biodiversity. We appreciate that they are willing to support a local effort that will be a model for many beyond the boundaries of the Upper Raritan Watershed."

For more than a decade, Merck employees around the world have volunteered thousands of hours to work on environmental projects with local groups through its "Champions for the Environment" program. Through this program, Merck provides grants to support environmentally focused projects initiated by employees at its facilities in communities worldwide. With its corporate headquarters in Whitehouse Station, Merck employees have been involved in many URWA programs over the years. URWA is especially grateful to Merck employee Nancy Held, who works in the Neuroscience New Products/GHH division, for her leadership in successfully bringing this project forward for consideration. She will play a key role in recruiting a team of Merck volunteers who will assist with the project.

URWA Seeks Volunteers for History Project

2009 will be a year of celebration for the Upper Raritan Watershed Association (URWA), as it marks 50 years of service to the communities it serves. In preparation for this milestone, URWA is embarking on a project to document the most significant projects, and the people behind them, that have protected the natural resources of the region since 1959.

Everyone interested in history and conservation is invited to join in on this project! Volunteers will cull through 50 years worth of photos, newspaper articles, newsletters and other documents that are stored at URWA's headquarters at the Fairview Farm in Bedminster this spring and summer and carry out an oral history project. They will organize URWA's historical materials and conduct interviews with people who have played important roles in preserving the watershed. From students to retirees, there is a place for everyone who would like to be involved in this important project to document the environmental legacy of the Upper Raritan watershed. For more information about this project, or to volunteer, please call Susan Brookman at (908) 234-1852, ext. 20 or send her an email at sbrookman@urwa.org.



About the Upper Raritan Watershed Association

The Upper Raritan Watershed Association is a not-for-profit, membership supported organization working to ensure the protection of

the Upper Raritan Watershed through education, advocacy, land preservation, and stewardship. Since 1959, the Association has been preserving and protecting natural resources throughout the watershed, a 194 square mile natural geographic region defined by the drainage basin of the North Branch of the Raritan River and its tributaries. The watershed, which includes 23 municipalities in parts of Somerset, Hunterdon and Morris Counties, is a vital link in New Jersey's water supply system and contains large areas of undeveloped, environmentally significant land.

For More Information, please contact:

Susan Brookman, Membership Program Director
(908) 234-1852, ext. 20

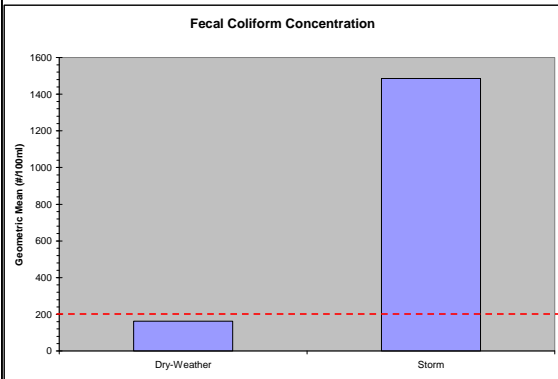
sbrookman@urwa.org



**NJWSA Releases Mulhockaway Creek Watershed Restoration Plan
Brian Friedlich, Omni Environmental LLC**

In December 2007, The New Jersey Water Supply Authority (NJWSA) submitted the Mulhockaway Creek Stormwater Management and Watershed Restoration Plan to the New Jersey Department of Environmental Protection (NJDEP). The Mulhockaway Creek watershed was chosen for a regional plan because water quality criteria for pathogens and temperature were exceeded and aquatic life was rated as moderately impaired. The watershed is also tributary to the Spruce Run Reservoir. The project was a collaborative effort of the NJWSA, NJDEP, Hunterdon County Soil Conservation District (HCSCD), and the project committee. Omni Environmental (formerly TRC Omni) performed sampling to track down sources of fecal contamination, analyzed ground water recharge potential, and developed retrofit projects. The sampling revealed that much higher fecal coliform levels are associated with storm conditions than dry weather conditions (see graph below), demonstrating the importance of stormwater runoff as a source of bacterial contamination.

The Plan identifies five watershed-wide projects and fourteen site-specific projects for restoration. Of these, six projects were prioritized for more immediate implementation. Together, the projects aim to comprehensively address the major water quality impairments in the watershed.



Dry-Weather versus Storm All Sampling Locations Combined

Priority Watershed-Wide Projects

A comprehensive agricultural management plan was proposed to establish best management practices (BMPs) in the watershed. In 2003, the NJDEP issued a Total Maximum Daily Load (TMDL) for fecal coliform (used to determine pathogen contamination) in 48 streams of the Raritan Basin, including Mulhockaway Creek. The TMDL required a 91 percent load reduction of fecal coliform to no longer adversely impact Mulhockaway Creek. Agricultural BMPs would not only substantially improve pathogen impairments, but would also address erosion and sedimentation, elevated stream temperature, and aquatic life impairments. The program would include a nutrient management plan which would require farmers to establish BMPs such as exclusion of livestock from the stream and improvement of the riparian buffer. The program could be implemented in conjunction with NJWSA's River Friendly Farm Implementation in the Raritan

Basin Watershed.

A sanitary survey and illicit discharge removal program was proposed to combat human sources of pathogen contamination. The Fecal Coliform TMDL Implementation Recommendations, submitted as a companion document to the Restoration Plan, evaluated the potential pathogen sources based on detailed monitoring, a remote-sensing analysis, windshield surveys, and local knowledge. There are known sources of bacterial contamination in areas of high septic system density and older residential areas. In addition, the HCSCD found more than 100 outfall pipes suspected of being illicit connections. The Watershed Restoration Plan has therefore recommended a sanitary survey and illicit connection program to begin removing these sources of contamination.

The NJWSA recommended that the Union and Bethlehem Townships' ordinances be strengthened to require maintenance on existing facilities and provide the regulatory framework to protect riparian areas. HCSCD performed a detailed inventory of the existing stormwater management infrastructure in the watershed, including pipes, inlets, swales, ditches, detention basins, and best management practices. Much of the existing infrastructure was found to be in poor condition and inadequately maintained. The recommended ordinances also require funding to ensure future maintenance on existing facilities. These ordinances could lay the groundwork for the establishment of a stormwater utility, which would guarantee funding for the maintenance of existing stormwater management infrastructure in the watershed. While not yet widely used in New Jersey, stormwater utilities are gaining popularity across the country as funding sources for stormwater management programs.

(Continued on page 13)

Mulhockaway Creek Watershed Restoration Plan (Continued from page 12)

Priority Site-Specific Projects



Existing Roadside Ditch

The highest priority site-specific project was to retrofit an existing ditch at the intersection of Van Syckel's Road and State Route 173 into a vegetated swale and wetland treatment system. The ditch showed signs of erosion and sediment deposition. The proposed retrofit would reduce runoff rates through detention and reduce runoff volume through infiltration prior to discharging to Mulhockaway Creek.

The NJWSA recommended retrofitting a detention basin at the Country Acres development into a constructed treatment wetland or a bioretention basin. The basin has not been maintained since it was constructed in the early 1980s. The outlet structure and berm are in poor condition and erosion is evident downstream. The homeowners of the property were highly motivated to rehabilitate the detention basin.



Poorly Maintained Detention basin at Country Acres



Eroded Outlet at Union Township Middle School

The retrofit of the stormwater management facilities at the Union Township Middle School was proposed to reduce runoff to the Creek and to improve water quality. The flow path through the wooded buffer at the School was eroded and there was substantial sediment deposition in the stream channel. Currently, there is no detention or infiltration on the property to control runoff from the highly impervious drainage area. The NJWSA recommended implementing bioretention swales and rain gardens on the property to improve the stormwater management. The retrofitted stormwater system would provide an excellent opportunity for education about stormwater, wetlands, and wildlife.

Next Steps

The creation of a Watershed Restoration Plan was just the first step towards implementing the prioritized watershed-wide and site-specific projects that would improve the water resources and aquatic life in the Mulhockaway Creek watershed. The immediate goals of the NJWSA include defining milestones to assess progress and securing funding to get the projects underway. The Watershed Restoration Plan has already been submitted for consideration under the 319(h) Nonpoint Source Pollution Control Program. Other sources of funding include the Environmental Stewardship funds from the Transportation Equity Act (TEA) grant program, the Environmental Quality Incentives Program (EQIP), and the Conservation Reserve Enhancement Program (CREP).

**Clinton Township (Hunterdon County) and Washington Township (Morris County) Update
Wastewater Management Plans
Bob O'Neil, NJWSA**

Background

In 2004 as the Highlands Taskforce, a precursor to the Highlands Water Protection and Planning Council, was completing its work on recommendations for the protection of the Highlands Region the New Jersey Water Supply Authority (NJWSA) secured a 604b grant from the Department of Environmental Protection (DEP) to improve the Upper Raritan Water Quality Management Plan (WQMP). A partnership comprised of the Upper Raritan Watershed Association (URWA), the South Branch Watershed Association (SBWA) and the Planning Departments of Hunterdon, Morris and Somerset Counties was organized to assist municipalities improved local planning and management of future land uses, including the control through Wastewater Management Plans of future wastewater services and their impacts.

During the course of grant the Highlands Water Protection and Planning Act was enacted and the DEP adopted revisions to the Water Quality Management Rules which shifted wastewater management planning responsibilities from local entities to the state's 21 counties.

Clinton and Washington Townships were selected as pilot projects to test a new guidance system (http://www.nj.gov/dep/watershedmgt/DOCS/WQMP/county_wmp_template_07.doc) developed by the NJWSA and designed to meet the new state standards. Both plans are currently under review by the DEP.

Clinton Township Wastewater Management Plan (Draft) - Summary of Significant Actions*

Environmental constraints as identified by the New Jersey Department of Environmental Protection, the Highlands Water Protection and Planning Act and the Township were incorporated into the plan.

✦ An expansion of the currently sewered area in the northwest section of the township along the Route 31 corridor and along Allerton Road is proposed. No new treatment facilities are proposed. Therefore, any in-fill development in the existing sewer service area and any new development in the proposed area are limited to the sewer capacity of the Town of Clinton Wastewater Treatment Plant and by the allocation of this Plant capacity provided to Clinton Township.

The proposed expanded area will allow the township to address its anticipated affordable housing obligation, promote smart growth in an area designated for development/redevelopment, and allow for the protection of environmentally constrained areas elsewhere in the township. The proposed sewer area expansions are located within the "Existing Community Zone" as identified by the draft Highlands Regional Master Plan. The Existing Community Zone generally consists of previously developed areas that have limited environmental constraints, have infrastructure to support development and redevelopment and includes areas where public sewer service is encouraged.

✦ The proposed Sewer Service Area will consist of:

- All Clinton Township Sewer Areas currently served,
- The expanded areas described above,
- The "Glen Meadows / Twin Oaks" franchise area,
- The reduced "Clinton West" area consisting of all contiguous properties under common ownership of Exxon,
- The proposed "Clinton East" area which is the subject of an existing franchise agreement with Allied Wastewater Management and contingent upon NJDEP approval of a wastewater treatment facility,
- The areas currently served by the Readington-Lebanon Sewerage Authority, and
- Individual properties subject to existing NJPDES permits.
- All remaining undeveloped and underdeveloped properties have been designated as a Septic Management Area.

* See the Clinton Township Wastewater Management Plan (Draft) p. 2.2 prepared by Hatch Mott McDonald, consulting engineers. For additional information, please contact Clinton Township or visit their website at <http://www.township.clinton.nj.us> .

(Continued on page 15)

WMP Updates *(Continued from page 14)*
Washington Township Wastewater Management Plan (Draft) - Summary of Significant Actions*

◆ Morris County will replace the Washington Township Municipal Utilities Authority as the Designated Planning Agency.

◆ Several properties within the Highlands Preservation Area currently using marginally acceptable septic systems are proposed to be included in a sewer service area. This includes adjacent properties that could be developed in the future. This will permit the extension and upgrade of sewer infrastructure to connect these properties to a public collection system instead of replacing or installing a septic system that poses a threat to public health and wildlife.

◆ Several additional properties are included in a sewer service area. These include a new municipal complex area, comfort stations at Harrington Park and Palmer Field, Valley View Chapel, and undeveloped residential lots adjacent to lots currently utilizing marginally acceptable septic systems. This will permit the extension and upgrade of sewer infrastructure to connect these properties to a public collection system.

◆ As part of the WMP, the following analyses were performed for the entire township:

- Environmental Constraints/Buildout Analysis
- Nonpoint Source Pollutant Loading Analysis
- Point Source Pollutant Loading Analysis
- Depletive/Consumptive Water Use Analysis
- Riparian Corridor Analysis
- Threatened and Endangered Species Analysis
- Steep Slope Analysis
- Impervious Surface Analysis
- Contaminated Areas Summary

* See the Washington Township Wastewater Management Plan (Draft) p. 6 prepared by CMX, consulting engineers. For additional information, please contact Washington Township or visit their website at <http://www.washtwpmorris.org/>.

5 Tons of Litter Removed From Local Waterways

Anneli TerryNelson, Stony Brook-Millstone Watershed Assn. Litter. It's repulsive and it's everywhere. We are all guilty contributors when we merely stand back and look on in disgust. We often think it's too dirty and that picking it up would be inconvenient. Have you ever wondered what happens to all that trash? It certainly doesn't just disappear on its own! With every rain event, the litter gets washed closer to a storm drain, eventually ending up in our streams and rivers, polluting not just our land, but also our water. Unless, of course, someone picks it up.

Over two weekends 237 volunteers from Cranbury, East Windsor, Franklin, Hightstown, Lawrence, Millstone, Monroe, Princeton, and West Windsor participated in the Second Annual Stony Brook-Millstone Watershed-wide Stream Cleanup. Together, the volunteers hauled out a combined total of over 10,000 pounds (5 tons) of trash from their local waterways.

Robert Connacher, a volunteer at the cleanup in West Windsor, said that removing the litter brought him a real sense of fulfillment and accomplishment. "I enjoyed how so many people were willing to come out and work together to make a difference in the community. I had no idea there was so much pollution in the D&R Canal and on the banks."

Tom Sanderson of Franklin Township's Public Works, who has been cleaning up his town since 1985, said, "Any cleanup small or large is beneficial to our entire watershed and our ecosystem." He added, "Every bit counts whether it's two bags or fifty bags, it all goes towards the same crucial environmental cause."

With almost twice as many towns participating this year compared to last year, the event is growing. Unfortunately, several of the towns from last year returned to the same stream sites this year only to find that the trash was back. Although the watershed-wide event will return next spring, you don't have to wait that long to do your part and pick up what someone else carelessly dropped.

This year's cleanups were sponsored by the Stony Brook-Millstone Watershed Association, participating municipalities, American Rivers, Eastern Mountain Sports, Saul Ewing, Wegmans, and Whole Foods, with additional Clean Communities funding for Cranbury, Lawrence and West Windsor.

The Stony Brook-Millstone Watershed Association (Watershed Association) is central New Jersey's first environmental organization. The Watershed Association works to enhance the quality of the natural environment in the 265-square mile region drained by Stony Brook and the Millstone River. The Watershed Association addresses key issues affecting water quality and land use, educates area residents about the ecology of the natural environment, and preserves open space by maintaining an 860-acre nature reserve. More information is available at www.thewatershed.org.



Upcoming Events

Upcoming Events

Eco-Adventures at the EARTH Center Rutgers Cooperative Extension of Middlesex County

Middlesex County students entering 5th through 7th grades are invited to attend a new program through the County's Extension office called "Eco-Adventures at the EARTH Center". The program will be held August 25th through the 29th from 9am to 2pm at the EARTH Center in Davidson's Mill Pond Park, South Brunswick.

The program focuses on environmental stewardship and will have a different theme for each day including *Resource Conservation*, *Don't Trash Our Planet* and *Ecological Issues*. Most days will begin with an exercise in teambuilding skills to help students get acquainted through fun, hands-on activities. Arrangements can be made for kids with special needs.

The cost of the program is \$110 and includes program materials, a peanut free snack, beverages, and a parting gift. Attendees are expected to bring their own brown bag lunch. The registration deadline for Eco-Adventures at the EARTH Center is August 15th, but interested participants should register soon as spaces are filling up.

If you would like more information on Eco-Adventures or to register, please contact the Middlesex County 4-H office at (732) 398-5261. To learn more about Middlesex County's Extension Service Department visit www.co.middlesex.nj.us/extensionservices

4-H is a department of Rutgers Cooperative Extension of Middlesex County and offers educational programs to all youth, grades K through 13 on an age appropriate basis, without regard to race, religion, color, national origin, gender, sexual orientation or disability.

NY/NJ Baykeeper

2008 Eco-Cruises on the Captain John July 27 - Navesink River Tour

New this year! Take a high tide tour upstream on the Shrewsbury to the scenic Navesink River, one of the prettiest rivers on the East Coast. Scenic Jersey Shore towns, pristine salt marshes and sedge islands, forest covered bluffs, and a wide variety of boats.

August 24 - Lighthouse Tour

Return of a favorite! Get an close up look at the historic lighthouses of the lower New York Harbor. Most of these lighthouses can only be seen by boat. Enjoy a sail on the Raritan Bay, learn the history of our Harbor Lighthouses, and do some birding.

All trips are aboard the Captain John, a clean and comfortable hundred passenger charter. Feel free to bring light refreshments and beverages.

All trips will board in Keyport, NJ at 3:30pm.

Tickets are \$40

For tickets and reservations call 732-888-9870, ext 6 or order online at: <http://www.nynjbaykeeper.org/news/143>

Space is limited. Order your tickets now!

Thank you for supporting NY/NJ Baykeeper.

Conferences

September 22, 2008: New Jersey Section of the American Water Resources Association Fall Conference
See www.njawra.org for more information

September 23, 2008: American Rivers Floodplain Management Conference. See Page 20 for details.

October 20-24: New Jersey Section of the American Water Resources Association "River & Stream Restoration: Geomorphic & Ecological Processes". See Page 20 and www.njawra.org for more information.

October 21-22, 2008: New Jersey Association for Floodplain Management Annual Conference. See www.njafm.org for details.



The Raritan Plan: Four Years Later *(Continued from page 1)*

(ground and surface water) that defines available supplies, identifies stressed areas, and allocates water yields within sustainable levels (RB-S3);

- developing a planning “toolbox” for municipalities and developers that can be used to control development impacts (RB-S5);
 - developing local institutional capacity to ensure implementation and proper operation, maintenance, upgrades and replacement of stormwater management systems (RB-S6), which would include recharge systems;
 - developing and implementing watershed-based stormwater management plans for all watersheds with major existing or anticipated development (RB-S7); and
- implementing a ground water recharge restoration pilot project in subwatersheds that have lost significant recharge due to past land use changes (RB-S8).

These Basin Strategies are consistent with and reflect a variety of protection strategies for the North & South Branch Raritan, Millstone and Lower Raritan Watershed Management Areas.

So, How Are We Doing?

Significant efforts are in progress to implement some, though certainly not all, of these strategies. The “out of sight” nature of recharge is a constraint on success, but progress is being made.

NJDEP Rules – The Municipal Stormwater Management rules, adopted in 2003, provide for maintenance of pre-construction ground water recharge through a combination of nonstructural and structural methods for any development greater than 1 acre total or ¼ acre of impervious surface. The NJPDES municipal stormwater permits for all municipalities include a requirement for local ordinances that match the NJDEP rules, including recharge.

Land Preservation Programs – The Raritan Alliance developed a Critical Water Resources Protection Area map for use by land preservation programs. One component of this map is the delineation of the prime ground water recharge areas for each watershed of the entire Raritan Basin. The NJ Water Supply Authority relies on this map (and a similar one for the Spruce Run Reservoir watershed) to target its acquisition work using ratepayer funds. Some other acquisition programs have also used the map for this purpose.

Highlands Water Protection and Planning Act – This act has profound impacts on land use in the Highlands Region, which includes 17 percent of the Raritan River Basin. The Regional Master Plan proposed by the NJ Highlands Council includes provisions for protection of prime recharge areas, to supplement the NJDEP requirement for maintenance of recharge volumes.

Local Land Use Ordinances – Few if any municipalities have adopted ordinances requiring protection and deed restriction of ground water recharge areas, though many have inventoried them. As mentioned above, nearly all municipalities have adopted new stormwater ordinances for new development projects, as required by NJDEP, including the maintenance of recharge volumes.

Stormwater Restoration Plans – Some planning efforts are specifically looking at ground water recharge estimates and trends, but to date none have incorporated different requirements than the NJDEP statewide measures.

Water Supply Planning – Both the NJDEP and the NJ Highlands Council are assessing water availability using a similar technical method that combines ground and surface water information. The NJDEP approach is at the HUC-11 watershed level, while the Highlands Council method uses HUC-14 subwatersheds. In both cases, the focus is on the availability of water for uses, rather than recharge maintenance, but the methods do rely heavily on recharge information.

What Will the Future Bring?

Ground water recharge is difficult to measure and even more difficult to explain to the public. New State and local regulations will slow the loss of recharge, as will land preservation efforts, but restoration of recharge will require education of the public and local officials regarding the benefits to water supply, stream flow and communities.

The next article will focus on Stormwater Impacts.



Quail Brook Golf Course: First “River-Friendly Golf Course” in the Main Stem Raritan River Basin

Darrell Marcinek, CGCS, Director of Golf Maintenance, Somerset County Park Commission

- information provided by Thomas Grigal and Ed Highland from SCPC and Kathy Hale and Tara Petti from NJWSA

The Somerset County Park Commission (SCPC) operates five golf courses, which are located on over 1,000 acres of preserved parkland in Somerset County, New Jersey. On December 11, 2007, one of our golf courses was certified as the first “River-Friendly” course in the main stem Raritan River area. This certification is not only a tremendous accomplishment for the park commission and its staff, but is another positive achievement for the golf industry. The certification process began in 2005 when Tara Petti, Assistant Watershed Protection Specialist from the New Jersey Water Supply Authority (NJWSA), contacted Thomas Grigal, golf course superintendent. The group's goal was to develop a set of River-Friendly actions specific to Quail Brook Golf Course.

Quail Brook Golf Course celebrated its 25th anniversary on June 11, 2007. It is an 18-hole golf course with a driving range, designed by Edmund Ault and situated on 205 acres of parkland owned by the county. The golf course encompasses 170 acres, plus an additional 35 acres of walking trails, playgrounds and a natural grass athletic field. Since its inception, over half the golf course has been lined by homes and condominiums, some of which encroach as close as 10 yards from greens and tees. The remaining holes are lined with indigenous trees and meandering streams and wetlands. The main purpose of this certification program was to preserve our most precious natural resource and maintain amicable relationships with our neighbors.

Our main goal for water quality was to reduce the fertilizer and pesticide levels within local bodies of water. This plan was already in place as part of our ongoing Integrated Pest Management (IPM) strategy. Our first action was to increase and define vegetative buffers around surface waters on the golf course. In most cases and depending on the location, vegetative buffers were increased from none at all to a width of 20-50 feet around waterways and wetlands. The buffers that surround our streams and ponds are not treated with chemicals or fertilizers and are mowed a minimum of once per year. The buffers surrounding wetlands are not maintained. The additional buffers significantly slow and “filter” stormwater runoff and any pollutants it may carry. Also, buffers help reduce stream bank erosion during high water flows.

Other practices involved in water quality management at Quail Brook Golf Course include:

- using slow release and organic fertilizers
- using plant protectants with
 - low toxicity
 - high absorption rates
 - short half lives
- documenting and mapping “hot spots” that need treatment
- establishing acceptable pest thresholds

New Jersey Water Supply Authority and The River-Friendly Program

The NJWSA was established in 1981 to operate and protect water supply facilities in the Raritan River basin system. This system includes 11 waterways spread over 1,100 square miles, serving 1.3 million residents in more than 5 counties. Development in the watersheds, compounded by the loss of wetlands and riparian buffers, has dramatically increased stormwater flows and non-point source pollution. This infringement not only poses a serious threat to our water quality, but wildlife and wetland species of plants and animals. In response to these threats the NJWSA, in conjunction with two local watershed associations, applied for and received a Targeted Watersheds Grant from the United States Environmental Protection Agency in 2003. Subsequently, the River-Friendly Golf Course Program was developed to provide large landowners the chance to become local stewards. The certification process involves four major categories:

- Water Quality Management
- Water Conservation Techniques
- Wildlife and Habitat Enhancement Education and Outreach.

Each category has, but is not limited to, one main goal set forth by NJWSA and is specific to each golf course.

(Continued on page 19)

Quail Brook Golf Course *(Continued from page 18)*

- clipping recycling (clippings are collected on greens only)
- performing annual soil testing to determine nutrient requirements
- testing pond water.

During 2008, a new chemical storage building and wash-water recycling system are scheduled for construction.



Water conservation is as equally important as water quality protection and is managed in conjunction with our water quality protection practices. The main water conservation goal is to decrease water use on the golf course. Our first action was simple; create no-mow and no-spray areas on the golf course that would decrease water usage and protect ponds, wetlands and streams, without over penalizing our golfers. Also, these "natural" areas help to reduce maintenance costs and save labor. Turfgrass accounts for approximately 90 acres of the course's 170 acres. Greens, Tees, and fairways account for 40 of the 90 acres. We wanted to convert an additional 25 acres to natural landscape.

After careful consideration, we were able to let almost 20 acres grow natural. Some of these areas surround fairway and greenside bunkers, enhancing the beauty and aesthetics of the golf course. These areas are clearly marked with signage and hazard stakes. Golf carts are strictly prohibited from entering these sections. As a result, we had a 25% savings in fertilizer and more important, only 45% of our annual water allocation was used. We are aggressively over-seeding drought tolerant species of fescue into these areas now that golfers have accepted them as an integral part of the golf course.



Other water conservation methods at Quail Brook Golf Course include:

- Hand watering and syringing, which are integral parts of achieving and exceeding our goals in this category.

A fully automated irrigation system with new pumps and high density polyethylene pipe (HDPE) is scheduled for construction during 2008. This system will allow us to water the golf course much more efficiently and significantly decrease the number of potential leaks as compared to traditional polyvinyl chloride (PVC) systems.

The program's third category pertains to wildlife and habitat enhancement. This was perhaps our most challenging goal because of the NJWSA's target of 50% of the golf course's landscape has to be enhanced or preserved natural landscape. Approximately 52% of the property was either wetlands or woodlands which was sufficient for NJWSA, but not for us. As stated previously, close to 20 acres of turfgrass was converted to "natural" landscapes. Also, we positioned blue bird houses within these areas to serve a dual purpose. They encourage blue bird nesting sites and indicate where irrigation valve boxes are located, allowing us to quickly isolate an irrigation break. It is virtually impossible to find an irrigation valve in natural areas that have tall vegetation.

In addition, a wildlife inventory was created and is updated semi-annually to evaluate activity, number of eggs, locations, etc. Again, entry into these areas by workers and golfers is strictly prohibited. This prohibition is conveyed by the starter, on the scorecard and with signage.

Other habitat enhancements at Quail Brook Golf Course include:

- installation of bat houses near the clubhouse to naturally control insect populations
- hand removal of invasive species rather than chemical treatments
- preservation of dead or fallen trees within out-of-play areas to encourage woodpeckers, hawks and owls.

The final program category, education and outreach, is ongoing and must extend beyond the realm of our golfers. This is, politically speaking, the most important category of the four. The goal is to document and communicate the course's achievements to the public. This process began two years ago with clubhouse displays and verbal communication that provide details about the certification program to our golfers and em-

(Continued on page 21)

Livable Communities and Living Rivers: Natural Flood Management through River Restoration

Host/organizer: American Rivers
Co-hosts: NJ Department of Environmental Protection NJ Association for Floodplain Management
NJ Section, American Water Resources Association
Funder: Geraldine R. Dodge Foundation

This free one-day course will cover a wide variety of natural flood management techniques that can be utilized to attenuate flood flows while also restoring the self-sustaining functions of rivers and floodplains. The course will reinforce the principles of hydrology, hydraulics, river processes, and floodplain and wetland functions, as well as introduce practical solutions and techniques to reduce flooding while re-establishing river function and connectivity. The goal of the course will be to help planners and local decision makers achieve livable communities along healthy rivers in the face of New Jersey's escalating flooding challenges. The course will emphasize preemptive planning decisions that can be implemented to reduce future flooding damage and build more resilient human and natural communities.

The course instructors are local and national experts well-versed in sustainable solutions to flooding problems. They will share their experience and multiple examples on how best to reduce flooding while achieving healthy communities and healthy rivers.

Lunch and refreshments will be provided and travel scholarships are available.

Who Will Benefit: Local decision makers Emergency management officials
Community hazard mitigation planners Watershed organization staff
Legislative staff

Course Planning Committee:

Laura Wildman, P.E., Stephanie Lindloff, Brian Graber – American Rivers
Kathy Hale - NJ Section, American Water Resources Association/New Jersey Water Supply Authority
Laura Tessieri, P.E., CFM* – NJ Association for Floodplain Management
Mark Mauriello, Helen Owens – NJ Department of Environmental Protection
Geoff Goll, P.E.*, John Miller, P.E., CFM* – Princeton Hydro
Mike Kline* – VT Department of Environmental Conservation
Jim MacBroom, P.E.* – Milone & MacBroom Inc.

* indicates course instructor

For More Info: Stephanie Lindloff, American Rivers, 518-482-2631, slindloff@amrivers.org



“River & Stream Restoration: Geomorphic & Ecological Processes”

October 20-21, 2008 2-Day Fundamentals October 20-24, 2008 5-Day Short Course
Duke Farms, Hillsborough, New Jersey

“River & Stream Restoration: Geomorphic & Ecological Processes” is ideal for those responsible for managing and restoring rivers and streams, as this course offers insights and approaches unlike those typically taken in many restoration projects today. This course emphasizes understanding geomorphic process as a sound basis for planning and designing stream restoration projects and programs, covering general principles and case studies from a wide range of environments. This course is a good choice for those seeking an understanding of process-based river restoration in contrast to the form-based projects commonly implemented.

The first two days are appropriate for practitioners, agency staff and managers responsible for supervising restoration programs and projects who wish to gain insights into the broad range of potential restoration goals and strategies and how to match those with the specific stream's situation. Practitioners responsible for designing projects will benefit from the subsequent three days, which provide more specifics and field-based instruction. Our team of instructors has brings a wide range of backgrounds and experience to the course.

Visit www.njawra.org for more information, including the agenda and registration information. Questions should be directed to njawra_stream@yahoo.com. We hope to see you in October!

Instructors:

Matt Kondolf, UC Berkeley
Peter Wilcock, Johns Hopkins University
Margaret Palmer, University of Maryland
Jack Schmidt, Utah State University
Mark Tompkins, CH2MHill



Raritan Basin
Watershed
Management
Areas

North & South
Branch

Lower
Raritan

Millstone

We want to hear from you!

Do you have an article for the Fall 2008 Basin Bulletin? Tell us about upcoming events that your organization is sponsoring. Tell us about projects that you're working on or have completed!

Please send articles to skean@raritanbasin.org and put Basin Bulletin in the subject header line.



Quail Brook Golf Course (Continued from page 19)

employees. The proshop staff is our first line of communication. Therefore, it is critical to keep them abreast of major changes to the golf course.

Proper training of the staff is instrumental because a simple mistake by an employee with a weed trimmer or misuse of a pesticide can have catastrophic effects. Educating our golfers is imperative because their opinions influence the landscape conditions on the golf course. For example, if they were not informed about the River-Friendly certification program, then they may not have tolerated our naturalized areas or buffers. They would have expected maintained grass up to the waters' edge instead of the buffers. Throughout the process, status reports were given monthly at senior staff meetings and public meetings attended by commissioners, freeholders and the local press. Our River-Friendly golf course sign is proudly displayed near the main entrance of the clubhouse and a plaque will be placed inside the proshop and maintenance building. The local press has already issued a news release and the local and national superintendent associations are also involved.



The Somerset County Park Commission's motto states that we are "committed to excellence in promoting stewardship of land and resources, providing outstanding recreational opportunities and leisure services, and fostering an environment which is service oriented and responsive to public needs". We have achieved our goal of establishing Quail Brook as a River-Friendly golf course, but our job has just begun. Our long term objective is to have five River-Friendly golf courses and all five courses certified as Audubon International sanctuaries. The prerequisites for Audubon International are similar to those that the NJWSA set, so we look forward to pursuing certification and striving for only the highest standards.

