Residents are encouraged to bid on rebates for up to 10 water efficient products. In this way Rahway residents indicate the compensation they need as an incentive to purchase the product. Rebates will be awarded to the lowest bidders.

Bidding on Water Conservation: Developing a Reverse Auction in the City of Rahway

By Michele Bakacs, Environmental and Resource Management Agent, Middlesex and Union Counties

Water in New Jersey is thought to be abundant because on average we receive 44 inches of rainfall per year. But New Jersey’s increasing population growth and expanding competition for potable water is increasingly straining the state’s limited water resources. By 2020, many municipalities within the state are projected to have water supply deficits. Frequent precipitation events and persistent flooding present obstacles when encouraging the public to adopt water saving practices.

A state-wide pilot program for water conservation is being developed by Rutgers Cooperative Extension...Bidding on Water Conservation continued on page 6 →

Welcome New Environmental and Resources County Agents

By Christopher Obropta, Rutgers Cooperative Extension, Associate Extension Specialist in Water Resources

Rutgers Cooperative Extension (RCE) and the New Jersey Department of Environmental Protection (NJDEP) have partnered to jointly fund the hiring of five Environmental and Resource Management County Agents. These five new Agents will focus on water resources in urban and non-urban watersheds. Extension is bringing science-based knowledge in a hands-on manner to the local level and these Agents are off to a great start. Each Agent is serving a two-county area and four of them have been hired and have gotten off to a great start.

Michele Bakacs is the Agent for Middlesex and Union Counties. She has begun to focus her efforts on working with stakeholders to implement the Robin...

Welcome New Agents continued on page 4 →
The award winning Barnegat Bay Shellfish Restoration Program opened its sixth year with an open house on April 27, 2010 at the Agriculture Center in Ocean County. The purpose of this event was to introduce people to the program, which has taught volunteers about Barnegat Bay and reached out to thousands while growing clams and oysters to release into the bay. As part of this program, volunteers attend a series of 2-hour classes in spring and fall sessions, and spend a portion of their summer raising clams and oysters at land-based upweller nurseries. Additionally, these volunteers conduct community outreach by educating the public and teaching youth. So far, over 150 volunteers have grown 7.5 million clams and more than 1 million oysters for release into the Barnegat Bay and its tributaries.

The main focus of this program, however, is not raising clams but raising environmental awareness and promoting positive actions throughout the watershed. In 2009, the volunteers provided science-based education about shellfish, Barnegat Bay and water quality issues to over 7000 people at lectures, demonstrations, and festivals. In addition, the program centerpiece, the Clam Trail is a public art and science education scavenger hunt throughout the watershed that has drawn media attention and accolades.

...Barnegat Bay continued on page 10 →

News from Capitol Hill: The Federal Clean Water Restoration Act

By Salvatore Mangiafico, Environmental and Resource Management Agent, Rutgers Cooperative Extension of Salem and Cumberland Counties

A recently introduced piece of federal water quality legislation has been generating considerable controversy among conservation and agricultural communities across the country.

The Clean Water Restoration Act of 2009 (S.787) (CWRA) was introduced to the U.S. Senate Environment and Public Works Committee by Russ Feingold (D-WI) and 24 co-sponsors with the purpose of clarifying the jurisdiction of the Clean Water Act (CWA). Supreme Court decisions in re-

...CWRA continued on page 5 →
Rain Gardens

By Pat Rector, Environmental and Resource Management Agent, Rutgers Cooperative Extension of Morris and Somerset Counties

A rain garden is a shallow depression where water can collect and then infiltrate into the ground rather than running off into the storm sewer system. The depression allows for the collection of the rain water from the impervious surfaces. Soil tests or percolation tests are conducted to assure that the water will drain into the soil within 24 hours. This alleviates one of the major concerns of homeowners – will the rain garden attract mosquitoes? The infiltration and the plants combined provide treatment of the stormwater, helping to treat water quality while being an attractive addition to the lawn or garden area of a yard. Water can be directed to the rain garden from pipes, roof areas, swales or curb openings. Rain gardens are designed to intercept, treat and infiltrate stormwater at the source before it becomes runoff.

Chris Obropta, Rutgers Cooperative Extension Water Resources Specialist, estimates that pollutant removal efficiencies of rain gardens may be: up to 90% removal of total suspended solids; 70–83% of total phosphorus removal; 70–83% removal of total nitrogen; 90–98% removal of lead from lead-based paint; 93–98% of zinc; and 90% of hydrocarbons.

The first rain garden was installed in a development in Prince Georges County Maryland in 1990. Melbourne, Australia has case studies of 57 rain gardens as it moves forward with rain garden implementation. In the United Kingdom rain gardens are beginning to take off, and there is even a musical band specializing in Indian and Celtic music named “Rain Garden”.

...Rain Gardens continued on page 15 →

Solar panel installations: a new type of “farming” in the Garden State?

By Salvatore Mangiafico, Rutgers Cooperative Extension, Environmental and Resource Management Agent, Salem and Cumberland Counties

With New Jersey being second only to California in solar panel installations, it’s not uncommon to find solar panels mounted on the roofs of homes and government buildings in the Garden State. Larger proposed solar panel installations, particularly those in which panels are ground-mounted, however, are creating controversy in several locations in the state. In Hamilton, a 16-acre proposed installation has raised the eyebrows of residents who fear converting the former farmland to energy production will hurt property values (see NJ.com articles on the Hamilton debate here and here). This installation would be part of series of projects proposed by PSE&G and different solar developers in Edison, Hamilton, Linden, and Trenton (see New Jersey Newsroom article on the PSE&G projects here). Upper...

...Solar Farms continued on page 4 →
son’s Branch Regional Stormwater Management Plan and the Manalapan Lake and Brook Watershed Restoration Plans. Michele has given several “Build-a-Rain-Barrel” workshops and is now providing train-the-trainer programs so she can instruct local organizations on how to deliver these workshops. Michele is also focusing some of her efforts on helping communities conserve water and has delivered a "Name Your Own Rebate" Program Rahway to provide rebates to residents that are interested in purchasing indoor water conservation devices like toilets, faucets, and washing machines. (See “Bidding on water conservation: Developing a reverse auction in the City of Rahway,” page 1 in this issue.)

Mike Haberland, the Agent for Camden and Burlington Counties, has begun to work with schools in the Cooper River Watershed in Camden County to deliver educational programs on stormwater management (See “Rain Barrels Workshops” in this issue.). He is also working with stakeholders in the Pompeston Creek Watershed to implement their Regional Stormwater Management Plan. Additionally, he has begun to conduct research on naturalizing detention basins to improve their pollutant removal efficiency and reduce their maintenance requirements.

Sal Mangiafico, the Agent for Salem and Cumberland Counties, has begun to work with stakeholders in the Upper Cohansey River and Upper Salem River to complete the Watershed Restoration Plans for these waterbodies. He is also working with NJDEP and our RCE Water Resources Program to develop demonstration projects on turf management for stormwater control and water conservation (See “Online Healthy Lawn Management Survey,” page 11 in this issue.)

Pat Rector is the Agent for Morris and Somerset Counties. She is working with stakeholder groups to implement the Troy Brook and Black River Watershed Restoration Plans in Morris County. Pat is also working with New Jersey Water Supply Authority to conduct educational and outreach programs in the Peter’s Brook Watershed in Somerset County. Additionally, she has begun an invasive aquatic vegetation working group to help lake communities address the invasion of invasive plants into their lakes (See “Water Chestnut Hits New Jersey,” page 7 in this issue.). Pat is also working to develop educational programming for Department of Public Works (DPW) employees, which will include several demonstration projects of greening of DPW yards in Somerset County.

RCE is very excited about these new hires and expect great things from these new Agents.

Pittsgrove, a rural community in Salem County, is considering the prospect of converting farmland to a 500-acre solar installation (see Philadelphia Inquirer article here). Proponents of these projects cite the need for renewable energy, job creation, increased tax revenue for municipalities, and the argument that ground-mounted solar panels could be installed in a manner that would preserve the land for future agriculture if the panels were later removed. Opponents worry about the loss of farmland, changing the rural or historic character of communities, property values, and a range of other concerns from the potential for glare to question about how these projects would tie into the current power grid.
cent years have limited the scope of the CWA, and some argue these decisions make the applicability of the
law unclear in some cases.

The Clean Water Act of 1972 is the primary federal law addressing water pollution. It aimed to eliminate the
discharge of pollutants to water bodies and included the purposes of promoting the propagation of fish, shell-
fish, and wildlife, and protecting recreational uses of water bodies. Certain agricultural, ranching, silvicultural,
and mining activities were excluded from some provisions by amendments added in 1977.

The original CWA defined the scope of regulated water bodies as “navigable waters”, but interpretation of the
scope of the legislation fell largely to the U.S. Army Corps of Engineers (USACE). In this interpretation, the
resultant USACE regulations stipulated that the law also applied to tributaries, wetlands, and other small water
bodies since their quality would impact the navigable waters specified in the bill.

More recently, however, the USACE’s interpretation was rejected by two Supreme Court decisions: Solid
Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers in 2001; and Rapanos v. the United
States in 2006. In these cases, the Supreme Court decided that USACE regulations exceeded the scope of the
“navigable waters” designation in the original law. In the Rapanos case, the Court stated that there must be
“significant nexus” between regulated waters and the “navigable waters” specified in the law. Unfortunately,
even with the explanation of the Court and guidance based on the U.S. Environmental Protection Agency’s
interpretation, some argued that it was still not clear which water bodies would meet this “significant nexus”
requirement and be subject to the CWA legislation.

The stated purpose of the newly introduced CWRA, then, is to clarify which water bodies the CWA could be
applied to. The bill specifically states that the law should cover those water bodies that had been regulated by
the USACE before the two Supreme Court cases. The bill calls these water bodies “waters of the United
States.”

The proposed legislation has generated a lot of news stories and opinion pieces across media sources. Sup-
porters argue that the CWRA would restore the protections given to streams and wetlands between the incep-
tion of the CWA and the recent Supreme Court cases. Organizations in favor of the new legislation include
conservation groups such as Ducks Unlimited and Trout Unlimited.

Detractors worry that the law would increase federal oversight of small water bodies on private land and in-
crease the regulatory burden on landowners. Opponents include a variety of farming, ranching, and livestock
organizations.

A result of this criticism has been the inclusion of the Baucus–Klobuchar–Boxer amendment, which explicitly
states that the exclusions for agriculture, ranching, silviculture, and energy development activities from the
1977 amendments would be preserved in the new bill. The amendment further reiterates the scope of the law
would return to that of USACE regulations before the Supreme Court cases, and not beyond that. With this
amendment, the legislation has garnered the support of some state farmer unions and other agriculture associa-
tions.
tension (RCE) Water Resources Program, Rutgers Cooperative Extension (RCE) of Union County, and The New Jersey Department of Environmental Protection (NJDEP) Division of Water Supply. Different water saving techniques are being tested in five communities throughout the state including developing a strategy to reduce indoor water consumption by residents. The expected outcome is to create and establish a set of simple reliable strategies for lowering a community’s water use that are proven to work and can be easily replicated statewide.

The city of Rahway, a densely populated municipality, was one of the five communities selected to test water saving strategies. Rahway is an ideal community to pilot an indoor water conservation program because close to 80% of the water use is indoors, with an average indoor consumption of 86 gallons per capita per day. Additionally, older homes on ¼ acre lots are common in Rahway, with 84% of homes being built before 1960.

One of the goals of the pilot program was to target a community with older homes, such as Rahway, where outdated fixtures and appliances might limit water conservation efforts. The program aims to determine the best method for getting residents to upgrade to more water efficient products and to discover what economic incentives are necessary for New Jersey residents to upgrade their indoor appliances and fixtures.

To address the question of economic incentives, a reverse auction was conducted to determine how to most effectively distribute funding to encourage the highest number of residents to upgrade indoor fixtures and appliances. Additionally, the program seeks to determine the effectiveness of installing water saving appliances and fixtures in households by monitoring water use after the installation of these devices.

Reverse auctions—also called procurement auctions—have traditionally been used to allocate funding for agricultural conservation practices. Unlike standard auctions, in a reverse auction there are multiple sellers competing for an award from a single buyer. Once bids are submitted, the awards go to the lowest bidders. If the bid includes a rebate or compensation amount, using a competitive bidding system helps to reveal the minimum compensation a participant would need to be offered as an incentive to adopt, say, an agricultural management practice which has some larger environmental benefit. Since the process is competitive, participants are aware that bidding for high compensation amount would lower their chances of being selected. The Rahway reverse auction works in a similar fashion, with the management practice that is “sold” being the installation of new water fixtures and appliances, the “sellers” being the Rahway residents, and the “buyer” being RCE.

The auction was marketed to residents of Rahway starting in February through a pro-
Native plants are plants that have developed or occur naturally, or have existed for many years in an area. Invasive plant species are plants that have been introduced from outside the region, have no natural controls or competitors, reproduce better, outcompete regional native species, and disrupt the balance of regional ecosystems. Water chestnut, or *Trapa natans*, also known as bull nut, European water chestnut, water nut, or water caltrop is an aquatic invasive plant species that is native to Asia and Europe. As is the case with most aquatic invasive species water chestnut can have major impacts on water uses including boating, swimming, water transport, human and animal health, drinking water quality, fish and wildlife habitat, flood control, commercial and sport fishing, irrigation, navigation, hydro-power generation, aesthetics and even real estate values. Although some New Jersey lakes and streams are already infested with water chestnut, the most efficient and cost effective management measure for water bodies without a water chestnut presence is prevention. In cases where water chestnut is already occurring, rapid response is important. In either case proper identification of water chestnut by local residents can be extremely helpful.

*Water Chestnut Hits New Jersey*

By Pat Rector, Environmental and Resource Management Agent, Rutgers Cooperative Extension of Morris and Somerset Counties

The Rutgers Cooperative Extension Sustainable Landscapes Program is creating a network of demonstration sites showcasing best management practices in turf, ornamentals, and vegetable gardens, producing aesthetically pleasing, low-maintenance, environmentally friendly landscaping with minimal costs and resources. In particular, the program focuses on ways to conserve water, prevent stormwater runoff, and reduce nutrient inputs in the Barnegat Bay Watershed. Thus far, there are twelve community managed properties participating in the program throughout Ocean and

*Sustainable Landscapes continued on page 10 →*
gram called “Name Your Rebate for Water Savings”. Residents are encouraged to bid on rebates for up to ten water efficient products. In this way, Rahway residents indicate the compensation they need as an incentive to purchase the product. Rebates will be awarded to the lowest bidders. Once products are purchased and installed, water use data for individual homes will be monitored to determine water savings.

The products included in the auction were high efficiency toilets, showerheads, faucets, and washers because these fixtures and appliances are typically the highest water users in the home. All products are highly water efficient, with many carrying the EPA WaterSense label guaranteeing they use at least 20 percent less water than average products in the same category. American Standard and W.A. Birdsall & Co., a local plumbing distributor, are cost-sharing the rebate with RCE.

While residents were not given any restrictions on the amount they could bid, they were encouraged to bid with a low rebate amount and informed that applications would be chosen based on the lowest rebate bids and on available funding.

The program was promoted starting February 4, 2010 with two articles in local newspapers, an announcement on the city’s website, and via an automated phone call to every home through the local water purveyor’s Rapid Alert system. Residents were directed to bid online at the Rutgers Water Resources Program website. Low initial response led to a direct mailing to 6300 single-family homes in Rahway with a brochure and application. (See graphics on next page.)

To date, 39 households have submitted bids on 112 products, with proposed rebate amounts ranging from 10 to 60 percent of the product price and with the average rebate bid being 32 percent. Further data analysis will be conducted to determine the cost-effectiveness of using rebates in this type of program by considering the potential water savings, whether products were actually purchased and installed, and the actual water use reductions measured in participants’ households.

Additional pilot programs are planned in Rahway to educate the public about the importance of indoor water-efficient practices, including audits conducted by high school students and targeting of the rental community in Rahway.

Resources:


More Ways to Conserve!

For more information on how you can conserve water and the U.S. Environmental Protection Agency Web site: www.epa.gov/watersense

WaterSense is a partnership program sponsored by the EPA. Its mission is to protect the future of our nation’s water supply by promoting and enhancing the market for water-efficient appliances and services.

This is a Rutgers University pilot program funded by the New Jersey Department of Environmental Protection, American Standard, Gerber Plumbing Co. and the Home Depot. This rebate program is designed to help us learn more about how much people are willing to pay for appliances and fixtures that consume water and could save, how much water is saved through the use of these appliances and fixtures.

What is saving water worth to you?

The Name Your Rebate program is designed to allow you to bid on the price you are willing to pay for products that save water.

This program is a one-of-a-kind offer to the City of Rahway residents and allows those selected to:

- Purchase top-of-the-line household products at a reduced rate.
- Save money on water, sewer and electric bills.
- Help conserve New Jersey’s precious water supply.

Instructions:

Step 1. Fill out this application by selecting your products and checking off your rebate bids. You can bid on more than one item.

Step 2. Submit your application by mail or online at www.waters.rutgers.edu by April 30, 2010.

Step 3. Rutgers will notify you by April 30, 2010 whether your bids were accepted. All details about your rebates, including how to purchase your water-saving product, will be sent to you on or before May 1.

Step 4. Purchase your products and install them at home. Make sure to hold on to your receipt for reimbursement.

For more information visit: www.waters.rutgers.edu or call (732) 398-0274

Name Your Rebate Application

To bid on a rebate for any of the listed water-saving items, complete this form and mail it by April 30, 2010 to Michele Bakacs, Rutgers Cooperative Extension, 42 Rice Ave., North Brunswick, NJ 08902.

Name _____________________________
Address ___________________________
City, State, Zip Code ________________
Phone _____________________________
E-mail _____________________________

Applications will be chosen based on the lowest rebate bids and on available funding.

American Standard Cadet 2 Toilet 1.6 gal. bowl
Save up to 12,360 gallons and an average of 80% per year.
Full Price: $350 + tax
10% 20% 30% 40% 50% Others

American Standard Cadet 3 Toilet 1.0 gal. bowl
Save up to 7,260 gallons and an average of 50% per year.
Full Price: $300 + tax
10% 20% 30% 40% 50% Others

American Standard Toilet 1.28 Gal. - Angled bowl
Save up to 10,800 gallons and an average of 75% per year.
Full Price: $350 + tax
10% 20% 30% 40% 50% Others

American Standard Whirlpool 4" Bath Faucet
Save up to 1,150 gallons and an average of 25% per year.
Full Price: $60 + tax
10% 20% 30% 40% 50% Others

American Standard Standard Williamsburg 4" Bath Faucet
Save up to 1,225 gallons and an average of 25% per year.
Full Price: $60 + tax
10% 20% 30% 40% 50% Others

Toto Drake II Toilet - elongated bowl
Save up to 9,960 gallons and an average of 65% per year.
Full Price: $330 + tax
10% 20% 30% 40% 50% Others

Viking 35" Stainless Steel Double Bowl
Save up to 11,640 gallons and an average of 60% per year.
Full Price: $60 + tax
10% 20% 30% 40% 50% Others

Hampton Royale 21" Cast Iron Undermount
Save up to 13,500 gallons and an average of 50% per year.
Full Price: $450 + tax
10% 20% 30% 40% 50% Others

Price shown are as of time of publication and are subject to change.

TERMS & CONDITIONS:
- Help us determine if these water conserving devices make a difference. Please check boxes to allow Rutgers to review your household meter use, as provided by your water company. United Water, Rahway, items purchased through this program may only be installed at the Rahway address indicated on this application.

- Receipts

- Donation to Rutgers University

- Allow Rutgers to share your results with others.

- All applications will be held confidential.

- This offer is available while funds last.

- This offer is available to residents of Middlesex and Union Counties.

- All applications are due by April 30, 2010.

- Winners will be notified by May 1, 2010.

We hope you will join us on the path toward conservation. Thank you for your support.

City of Rahway
Name Your Rebate
for water savings at home!
Participants travel to up-weller nurseries where clams are grown, and to large fiberglass painted clams in the area, or other points of interest to collect clam facts, so they are learning while they explore the Barnegat Bay watershed and local businesses.

In 2008, the Clam Trail won the Governor’s Excellence Award for Tourism, and was part of the recognition given by the Governor’s Award for Environmental Excellence (Honorable Mention, Healthy Ecosystems), as well as by the Association of Natural Resource Professionals Gold Innovative Program Award. In 2006, the Jersey Shore Partnership honored the Barnegat Bay Shellfish Restoration Program with a Seafood Industry Award. Rutgers Cooperative Extension has produced this program in partnership with the New Jersey Department of Environmental Protection, the Barnegat Bay Estuary Program, and the County of Ocean. For more information on this program, upcoming class sessions, or opportunities to attend outreach events, please visit http://ocean.njaes.rutgers.edu/marine/bbsrp.html or www.reclamthebay.com.

Monmouth Counties that have dedicated resources to learning about and implementing these management practices. In order to reach an audience of homeowners and community property managers, some of the sites will provide tours or workshops related to specific practices, and all of the sites will be represented on the Sustainable Landscapes website as case studies or virtual tours. An eventual goal of this program is to create a network of sites that share resources and provide public outreach on low-maintenance and sustainable landscaping topics. This work has been supported by a grant from the Barnegat Bay National Estuary Program. More information on this program can be found at http://ocean.njaes.rutgers.edu/ag/SustainableLandscape.html.
Build a Rain Barrel Workshop Lake Hopatcong
By Lisa Dunne, Watershed Ambassador, AmeriCorps Program

The Hopatcong Environmental Commission, in partnership with the AmeriCorps Watershed Ambassador Program and Rutgers Cooperative Extension Water Resources Program, will be hosting a Rain Barrel Building Workshop at the Hopatcong Civic Center Outdoor Pavilion on June 12th from 10am-2pm. Rain barrels are water saving devices that capture rain runoff from your roof and store it to be used to water your lawn or garden. They can hold up to 50 gallons of water and are designed to work with a standard garden hose. Not only can rain barrels save potable water and lower your water bill, but they also prevent excess rain water from running off impervious surfaces and carrying pollutants into streams and rivers. Registration is $45 and includes all the materials needed to build your rain barrel, and instruction on how to set it up outside your home. For more information or to register, please contact Lisa Dunne at americorps@northjerseyrcd.org or 908-735-0733 ext 111. Lisa is the Watershed Ambassador stationed in the Upper Delaware region and is the workshop coordinator.

The Watershed Ambassador program is a ten month community service program hosted by the NJ Department of Environmental Protection. The goal of the program is to educate the public about the importance of water resources and to monitor and work to improve water quality throughout the state. For more information about the AmeriCorps program contact Akili Lynn, NJDEP at akili.lynn@dep.state.nj.us.

Online Healthy Lawn Management Questionnaire for Homeowners Extended
By Elaine Rossi-Griffin, Rutgers Cooperative Extension Water Resources Program, Program Coordinator, and Sal Mangiafico, Environmental and Resource Management Agent, Rutgers Cooperative Extension of Salem and Cumberland Counties

The Rutgers Cooperative Extension Water Resources Program is pleased to announce the continuation of an online questionnaire that will document homeowners’ knowledge of healthy lawn care practices, will gather opinions about reducing reliance on pesticides for lawn care, and will share opinions on lawn care practices.

Residents over the age of 18 that live in Belmar Borough, East Greenwich Township, Egg Harbor Township, Livingston Township, or the City of Rahway are encouraged to take the questionnaire at http://salem.rutgers.edu/nre-surveys/lawn-care-survey.html.

The deadline for completing the questionnaire will be extended, so that the survey will be available through May 31, 2010.

For more information about the Turf Management for a Healthier Lawn Homeowner Questionnaire, please contact Salvatore Mangiafico at mangiafico@njaes.rutgers.edu.
Water chestnut was first recorded in North America near Concord, Massachusetts as early as 1859. Water chestnut currently occurs in Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, Pennsylvania, Vermont, Virginia, Washington, D.C., and the Great Lakes Basin. Water chestnut has been found in several state lakes in New Jersey, notably Lake Waywayanda and Lake Musconetcong. The New Jersey Department of Environmental Protection (NJDEP) is aware of occurrences in the following counties: Burlington, Hunterdon, Monmouth, Bergen and Morris Counties. Princeton Hydro, a lake management company that works extensively with various lakes throughout New Jersey, has identified the following water bodies as being infested with water chestnut: Kitchell Pond in Morris County; Goldens Run, Lake Baldwin, and Wall Street Journal Pond in Mercer County; Sidney Brook and several small private farm ponds in Hunterdon County; and a pond located within New Jersey’s Stokes Forest State Park. The Upper Raritan Watershed Association has identified water chestnut in Pacale Park in Hunterdon County. The Ewing Environmental Commission also identified Gold Run in Ewing as being heavily impacted in 2009. The dam at Gold Run failed during a storm in the spring of 2010 and the pond behind it has disappeared. Seeds from the pond have presumably traveled downstream. Gold Run is noteworthy in that it was one of the documented waterbodies heavily infested with water chestnut and it is a tributary to one of the State’s major river systems, the Delaware River.

Water chestnut grows best in shallow (i.e., less than 16 feet deep, with an optimum depth of 1–6 feet), soft-sediment, and nutrient-rich lakes and rivers. It also tends to prefer waters with a pH range of 6.7 to 8.2 SU. Water chestnut has a great capacity to reproduce and can grow up to five (5) rosettes within one square foot with an individual plant having leaves up to three layers deep in the water. Growth of this density can readily suppress not only the growth of submerged aquatic plants through a shading effect, but eliminate the occurrence of other floating aquatic plant species. Due to its rapid growth rate, highly resilient fruits, and ability to outcompete native plants, water chestnut can rapidly infest a lake or pond. A prime example is Lake Musconetcong, Morris County, New Jersey. As recent as 2008, the results of comprehensive aquatic plant survey of the lake documented low density occurrences of water chestnut in a few of the lake’s shallow coves. By the following summer water chestnut was impacting literally acres of the lake.

Educating homeowners, lake associations, boaters, fishermen and others that utilize lakes and streams is critical in stopping the spread of water chestnut.

Educating homeowners, lake associations, boaters, fishermen and others that utilize lakes and streams is critical in stopping the spread of water chestnut. Simple tactics to prevent the spread of water chestnut and other pest species between waterbodies should be stressed and include: remove all visible mud, plants, fish or animals from equipment, trailers, clothing, boots, buckets, etc., and eliminate all water, even water in small spaces where it may become trapped. Clean trailers, boats and other equipment that have come in contact with the plant with hot or salt water and allow the surfaces to adequately dry. This includes boats, equipment, trailers, wading boots, clothing and buckets.

...Water Chestnut continued on page 13 →
Dipping equipment into a 100% vinegar solution for 20 minutes or a 1% table salt solution for 24 hours can also kill many plants and pathogens that would be transported between lakes.

A combination of mechanical harvesting and hand harvesting has been successful in other states, such as Maryland, New York, Pennsylvania and Vermont. Harvesting can be a viable alternative to chemical treatments, especially when dealing with small or confined growths of water chestnut. Given that water chestnut is weakly rooted and prefers littoral areas (near shore areas) that are often too shallow for mechanical harvesters, hand harvesting is often a good method of removal. Harvesting is best done early in the summer in advance of the plants dropping fruit (seed). Examples of two successful New Jersey hand harvesting ventures are a Lake Musconetcong two day volunteer event and an Upper Raritan Watershed Sponsored event, both of which took place in 2009. Lake Musconetcong had a two-day volunteer hand-pulling event in the fall of 2009 to attack the water chestnut problem. The volunteers removed seven (7) tons wet weight of water chestnut during the 2-day event. Volunteers from the Upper Raritan Watershed Association and others removed the water chestnut from Pascale Lake in 2009 and have plans to return in 2010. For cases of large areas with heavy infestation mechanical weed harvesting is usually the more effective approach, in combination with hand pulling.

The chemical control of water chestnut is a regulated activity in New Jersey by the Department of Environmental Protection (NJDEP). This means that before any aquatic pesticide applications are conducted an aquatic pesticide use permit (APP) must be approved and issued from NJDEP’s Pesticide Control Program (PCP). Additionally, any such pesticide applications must be performed by a licensed pesticide applicator/business certified in category 5, aquatics. Aquatic pesticide applications addressing the control of water chestnut is best conducted during the early growth phase of the plants; typically between mid-May and early July. There are several aquatic pesticides on the market that are currently used to control water chestnut, with the most common possessing the active ingredient 2, 4-dechlorophenoxy acetic acid (2, 4-D). This is a systemic herbicide that is readily absorbed by the plant and affects the plant’s metabolic processes. 2, 4-D can be applied as liquid or in a granular formulation. The selection and use of this material, as with others, must be based on such factors, and product label directions. In addition, there maybe water-use restrictions enforced following an application of 2, 4-D that limits how soon after a treatment is conducted the treated water may be once again used, for irrigation or other recreational purposes. It is recommended that 2, 4-D not be used in potable water supplies.
In the news recently, a Phillipsburg-area water company has proposed raising residential water usage rates to $5.24 per thousand gallons (Express-Times article link), which wouldn’t be an unusual rate for residential areas in New Jersey.

Considering this rate, how much would it cost to water a residential lawn?

Well, doing some back-of-the-envelope calculations, let’s take a 10,000 square-foot lawn, which is just under one-quarter acre. Watering that lawn with one inch of water per week would require 833 cubic feet of water, or 6230 gallons, per week. At the $5.24-per-thousand-gallons rate, that would cost $33 per week. Assuming the lawn is watered for 20 weeks in a year—approximately May through September—that would mean $650 a year would be spent on water for the lawn.

Sounds like it’s time to switch to more drought-resistant landscaping.

Rain Barrel Workshops

By Mike Haberland, Environmental and Resource Management Agent, Rutgers Cooperative Extension of Burlington and Camden Counties

During the summer of 2009, faculty and staff from Rutgers Cooperative Extension developed a rain barrel workshop program in an effort to promote stormwater management for New Jersey homeowners. The program is designed to promote water conservation and stormwater management using rain barrels as an easy to understand technology. The workshops are a combination of lecture covering; home owner stormwater management, how to build a rain barrel, how to install a rain barrel, and decorating a rain barrel. The lecture is followed by each participant building their own rain barrel using supplies provided by Rutgers. Workshops are held throughout New Jersey and are conducted by Cooperative Extension County Environmental and Resource Management Agents and the Water Resources Program staff. To date, over 20 workshops have been held with an extremely positive response from the attendees.
Minnesota has implemented a policy of encouraging residents to install rain gardens. In Seattle a residential street was redesigned through a project named Street Edge Alternatives (SEA) with large rain gardens along most of the length of the street. The street width was also reduced and these improvements led to a noticeable reduction in impervious cover. They planted 100 evergreen trees and 1,100 shrubs and stormwater runoff has been reduced by 98% according to one study. Kansas City, Missouri has set a goal of 10,000 Rain Gardens for residential homeowners. Michigan has developed an aggressive educational program on rain gardens as has Atlanta, Georgia. Portland Oregon has created discounts on stormwater bills and rebates along with workshops and other resources to promote rain gardens. These are just a few examples of national initiatives being developed to promote the use of rain gardens to disconnect stormwater runoff from municipal stormwater systems.

If you are interested in more information on rain gardens Rutgers Water Resources Program website has information at [http://www.water.rutgers.edu/Rain_Gardens/RGWebsite/rgs_rgst_cert.html](http://www.water.rutgers.edu/Rain_Gardens/RGWebsite/rgs_rgst_cert.html). If you are looking for more information regarding plants you can access information at the USDA Plants National Database [http://plants.usda.gov](http://plants.usda.gov). Another on-line publication is *Plants for Stormwater Design: Species Selection for the Upper Midwest*, 2003, [http://www.pca.state.mn.us/publications/manuals/stormwaterplants.html](http://www.pca.state.mn.us/publications/manuals/stormwaterplants.html).

If your interest is now piqued, there are demonstration rain gardens in the following New Jersey counties: Burlington, Cape May, Cumberland, Essex, Gloucester, Middlesex, Monmouth, Morris, and Union. Please see the Rutgers Water Resources website for a map, location, and pictures of demonstration rain gardens in New Jersey. [http://www.water.rutgers.edu/Rain_Gardens/RGWebsite/](http://www.water.rutgers.edu/Rain_Gardens/RGWebsite/)

If you are interested in learning how to install a rain garden, Rutgers Water Resources Program offers Rain Garden Certification Training Classes. The New Jersey Agricultural Experiment Station and Rutgers Cooperative Extension provide a Rain Garden Certification Training Program, with two options. The first option is the Rain Garden Certification Specialist (RGS) program where trainees learn from the experts of Rutgers Cooperative Extension about the technical side of rain garden design, as well as being engaged in a hands-on rain garden installation. The Rain Garden Specialist and Trainer (RGST) option additionally provides an additional segment for educators and trainers. For either certification the trainees are required to pass an exam with a score of 80% or higher. All classes require advance registration. For registration information, see [http://www.water.rutgers.edu/Rain_Gardens/RGWebsite/rgs_rgst_cert.html](http://www.water.rutgers.edu/Rain_Gardens/RGWebsite/rgs_rgst_cert.html). Please contact Cheryl Burdick at 732-932-9800 x6106 with additional questions.

Current classes:

April 26 and 27 – Rutgers Cooperative Extension of Monmouth County
4000 Kozloski Road, Freehold, NJ 07728

May 4 and 5- Montville Township Public Library
90 Horseneck Road, Montville, NJ 07728

May 10 and 11 – Rutgers Cooperative Extension of Gloucester County
1200 North Delsea Drive, Clayton, NJ 08312
“It is a wholesome and necessary thing for us to turn again to the earth and in the contemplation of her beauties to know the sense of wonder and humility.” — Rachel Carson.
Don’t forget July 12th is Henry David Thoreau Day. “While civilization has been improving our houses, it has not equally improved the men who are to inhabit them. It has created palaces, but it was not so easy to create noblemen and kings.” — Henry David Thoreau, Walden, 1854.

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<td>12 Build a Rain Barrel Workshop, Hopatcong. Contact: <a href="mailto:ameri-corps@northjerseyrce.org">ameri-corps@northjerseyrce.org</a></td>
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We hope we have brought you an interesting newsletter, with both local news and thought-provoking tidbits on a larger scale. We look forward to seeing articles from you. We would love to have you submit articles related to what you are doing here in the Garden State, and also objective articles on larger environmental issues.

— Pat Rector and Sal Mangiafico, editors