



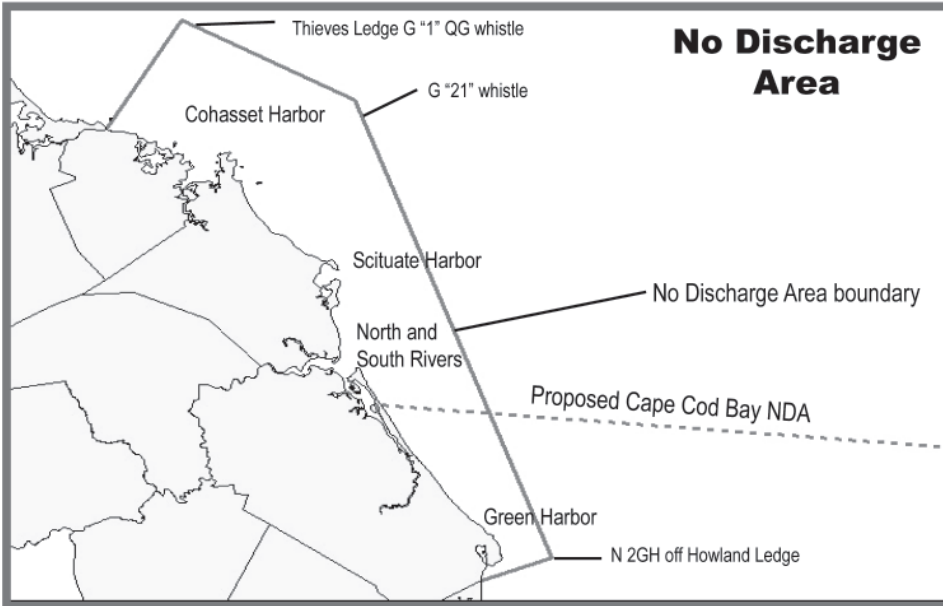
NSRWA
therivershed.org

July 2008

RiverWatch

THE NORTH AND SOUTH RIVERS WATERSHED ASSOCIATION, INC.

Finally! No Discharge Designation Approved



The new NDA is located east of Brant Point Marshfield to navigational marker N "2GH" located off of Howland Ledge, north to navigational marker G "21" Whistle located east of Minot Light, northwest to Thieves Ledge G "1" QG Whistle to the Cohasset town boundary. The new discharge area covers Green Harbor, the North and South Rivers, Scituate Harbor and Cohasset Harbor.

It has been over a decade since the NSRWA settled the discharge permit with Scituate Wastewater Treatment plant that required that Scituate pursue a No Discharge Area (NDA) designation for the North and South Rivers. An NDA is an area where all discharges of boat septage are prohibited regardless of treatment. This summer finally the rivers and the coastal waters off of Scituate, Marshfield and Cohasset will be approved by the EPA as an NDA.

The path to the designation has been long but worth it. In 1996, when Scituate first approached the Town of Marshfield about pursuing No Discharge Area designation for the rivers they were not interested, leaving Scituate unable to move the initiative forward since both towns hold jurisdiction in the rivers. In 2004, the

NSRWA decided it was time to get the initiative started again and we commissioned a survey of the South Shore pumpout services. The reason being that in order to pursue a designation we would need to prove to the EPA that there are adequate pumpout facilities available to boaters. At the same time we pursued identifying ways we might get pumpout boat to service the North and South Rivers. The end result was that a pumpout boat was granted from the Clean Vessel Program to a private contractor, Harbor Mooring Service, to provide pumpout boat service to the North and South Rivers. The pumpout boat is now available to boaters within the rivers and the 2004 pumpout study we initiated provided the background on needed for the NDA application. In 2006, we then asked

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Facts About Boat Sewage and No Discharge Areas

A No Discharge Area (NDA) is "an area of coastal or inland waters where all discharges of boat septage are prohibited regardless of treatment."

Cohasset Cove, Cohasset Harbor, the Gulf River Estuary (Scituate and Cohasset), Scituate Harbor, Green Harbor (Marshfield), and the North and South Rivers do not meet Clean Water Act standards because of bacterial contamination.

A town's harbormaster can enforce a No Discharge Area through a fine.

The new South Shore NDA will cover approximately 54 square miles.

The towns within the proposed NDA currently support nearly 3000 commercial and recreational boaters including residential and transient vessels.

A majority of boats are docked; moorings run a close second.

It is estimated that there are 1363 resident vessels with marine sanitation devices (MSDs) on the South Shore.

There are 10 pumpout facilities within the new South Shore NDA.

The NSRWA has been working for over 12 years to get the North and South Rivers designated as a No Discharge Area.

THE NORTH AND SOUTH RIVERS WATERSHED ASSOCIATION

The mission of the North & South Rivers Watershed Association is to preserve, restore, maintain and conserve in their natural state, the waters and related natural resources within the watershed.

Our goals are to:

- Restore the water quality of the rivers by identifying and correcting adverse impacts;
- Encourage stewardship of the watershed through public education, outreach and recreation programs; and
- Promote responsible growth by working in partnerships to preserve open space, scenic vistas and sensitive natural resources.

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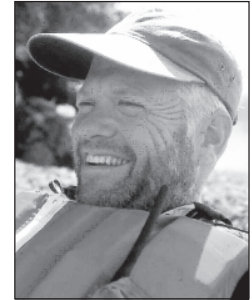
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Letter From The President

We paddle the protected shallows of the emerald green islands of the Tribal Group located off the central coast of British Columbia. We tour the temples and galleries of some of Mother Nature's best work. We drape strands of bull kelp across our decks to hold ourselves still in the current and peer over the sides of our kayaks into the clear water. Fronds of ribbon kelp speckled with herring roe undulate in the sun dappled surface. Red sea urchins graze the kelp beds, their numbers held in check by the coastline's jester, the sea otter. This whiskered wonder can eat up to fifteen pounds of food a day and is renowned for its tool use and other incredible adaptations. The triad of kelp, urchin and otter create another example of Nature's perfectly tuned balance and cycles.

The mist and rains of the temperate rain-forest that rise just beyond the ribbons of sugar white sand beaches create cathedrals of lofty, ancient cedar and fir. Run-off follows the rugged terrain to create streams, home to among other things, North America's only aquatic passerine, the American dipper or water ouzel. This songbird's unique habits include its ability to walk underwater and forage in the swift currents of streams, prodding for invertebrates, fish and fish eggs. Some of those eggs could be from salmon, sacred to the First Nation peoples. The complicated life cycle of the salmon connects thousands of species of plant and animal, directly linking the domains of both salt and fresh water. Eliminate just one component of this cycle and the system collapses.

Our watershed's cycles and connections between its forests, salt and freshwater marshes and intertidal zones are as complex and essential to our larger community as its West Coast cousin. Estuarine ecosystems filter pollutants, provide shelter and food for migratory birds and are nurseries for hundreds of shellfish and fish species.

The stunning view of the North River as you drive across it on Route 3 or Route 3A reminds us daily how beautiful our rivers are. Our watershed's secrets unfold though, as we immerse ourselves with the denizens of its detritus, critters of its tide-pools and residents of its hidden congregations.

We encourage you to take some time and inquisitiveness and explore the connected natural communities of our rivershed this Summer or if you are interested in further adventure join us for our Maine Kayaking fundraising trip in September. See if you can identify three distinct cycles or relationships that you are connected to in some way. We would enjoy hearing about your findings. E-mail me at douglowry@mac.com and I will compile stories and make them available on our website.

Thanks and see you on the water.

Doug Lowry
NSRWA President

Scituate Schools Watershed Curriculum Project

Thanks to a generous grant from the Scituate Rotary, the NSRWA and Mass Bays were able to help the Scituate 5th grade integrate watershed science and Greenscapes topics into their curriculum at each of their four elementary schools. Some of the funds were used by the school to purchase books on water science and ecology, and also to buy classroom water testing kits.

The other part of the grant went to the NSRWA to contribute their expertise to the development of the curriculum and to lead a lecture and field trip. During the first week of June, NSRWA and Mass Bays staff went into each of the schools to teach students about topics such as the water cycle, where water comes from in their town, and the geography of our watershed. Part of the class was a "Rivershed Jeopardy" game similar to the one played at our last annual meeting that helped to review the topics taught and make the class more exciting for the students.

At the end of the week, each of the schools went on a field trip around the watershed. The field trip included stops at the water treatment plant, the wastewater treatment plant, and the Driftway Park, a tour of important Scituate water bodies like the reservoir, and a jaunt out to Humarock to see the South River and to show how water has shaped the geology and geography of Scituate. The lectures and field trips were very successful. We hope to be able to continue working with local schools to integrate watershed science and Greenscapes principles into their curricula.

*By Sara Grady Ph.D.
Watershed Ecologist and
Massachusetts Bays South
Shore
Regional Coordinator*



The wheels on the bus go round and round...



Gene Babin, Scituate Water Superintendent, talks to Scituate 5th graders about water conservation.

Places to Explore this Summer

In Scituate, check out the **Driftway Conservation Park**. Located off the Driftway, this former Boston Sand and Gravel Co. mine is now a 450 acre park. Walking trails and picnic benches allow for public use of this popular site with its panoramic view of the Herring River salt marshes. (Public boat launch provides access to the Herring River).

In Norwell, **Stetson Meadows**, totals over 117 acres abutting the North River and offers nature study and hiking and the historic Stetson Ford House still stands on the site. Located off of Stetson Shrine Lane (beware of the unpaved long road to access!).

Take an historic tour of the river that launched a 1,000 ships - the **North River shipyards** are demarcated by plaques that can be observed as far downstream as the Union Street Bridge (Block House Yard) and as far upstream as the Old Washington St Bridge (Hanover Yards). Get an NSRWA Recreation Map and Guide to follow along!

In Marshfield, visit the new **Recreation Department** at the Old Coast Guard building off of South Ferry Street. Walking trails and picnic tables with views overlooking the South River.

Rivershed Steward Profile: Austine Frawley

This past year the Volunteer of the Year Award was presented to Austine Frawley, who was co-chairperson of the extremely successful 2005 and 2007 NSRWA benefit auctions. Austine was instrumental in helping the NSRWA raise almost \$50,000 at these two fundraisers. We cannot thank her enough for her efforts.

In Austine's parallel life, by day she works for New England Region I EPA as an Environmental Protection Specialist and has been doing that for 30 years. Austine truly is an example of someone who strongly believes in walking the walk. We caught up with our go-getting, knows-everyone, never-sits-down, always-has-a-smile, volunteer of the year and asked her a few pertinent questions about her thoughts on the NSRWA and its mission.

How long have you been a member of the North and South Rivers Watershed Association?

A long time, over ten years. I grew up in Canada but our family summered in Scituate and I moved here as an adult.

How did you first come to know the NSRWA?

I believe that I learned about it through Dr. Parson - my dentist. It seems like it has always been an organization that I have known about.

Why did you become a member?

Because it is part of my community and I wanted to protect the marshes and the rivers. You know the saying Act Locally, Think Globally...it's our backyard and we need to take care of it. Or as my dad and Muhammed Ali say, "Service to others is the rent you pay for your room here on earth."

What concerns you most about the future of the watershed?

Unchecked development and sprawl. On

a bigger scale, global warming and the increase in the rise of sea level—our coastline is so vulnerable. Stormwater is another big issue for us to tackle as more construction continues to pave over natural areas, displacing wildlife and altering the water cycle. Every action has a reaction, we need to have more balance.

What gives you hope about the watershed?

The people...there are many dedicated, concerned and committed people that live, work and volunteer here and support the watershed. We are very lucky to have the NSRWA with its technical ability and insight to focus on what is important. It keeps people involved.

"The best part of the NSRWA is the people..."

What is your special place in the watershed?

What's more beautiful than going over the Route 3A Bridge—it literally takes my breath away to see that view. No matter how many other beautiful areas I travel to I always think of that view as one of the most beautiful and interesting. It sounds sappy but it's true.

What are the two things you think everyone who lives in the watershed should know about the watershed?

Everyone should know about the NSRWA and know what a watershed is—pay more attention and be aware of it. I don't think people realize all the tangible benefits they have received because



of the NSRWA, when they are clamming, boating or just enjoying the wildlife and areas that have been protected because of the NSRWA membership, past members and volunteers and the staff's hard work and perseverance.

What is the reputation of the NSRWA from the perspective of the federal environmental agencies?

My knowledge is biased...but many people use the NSRWA as an example of why local advocates are so important. The leveraging of resources that the NSRWA does is an incredible asset to meeting our environmental goals.

How important is the NSRWA's role and any other NGO advocate in protecting resources? Why can't the government do it alone?

Government doesn't have all the resources and it is everyone's problem to repair and care for the environment. We all need to be proactive and membership groups like the NSRWA are on the ground getting results.

The NSRWA is grateful for our vested volunteers like Austine. The value of their work and the inspiration they spark in others is essential to the health and effectiveness of our association. Thank you Austine!

The NSRWA Steward Profile is a series of interviews of active volunteers that have contributed their skills, hard work and commitment to the North and South Rivers watershed community. The NSRWA thanks each of our volunteers —our organization thrives because of your participation.

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NSRWA's 21st Annual Clean Up Day

In spite of the gloomy rainy weather at the start of the Clean Up at 9 am, volunteers came out in rain gear to pick up trash and debris along the North & South Rivers and tributaries. Almost miraculously, the rain subsided at about 9:30 lending perfect conditions for Clean Up Day, with glorious weather at the celebratory cook out generously sponsored by Whole Foods Market..

We had a great turnout at the Driftway Park. New folks and long time volunteers showed up and did a great job cleaning along the Herring River, Rt. 3-A bridge area and the Driftway recreation area. REI was on hand to hand out "Get Dirty - Pitch in for the Environment" t-shirts, plus water bottles and granola bars, to the volunteers.

The usual trash was found at all the sites including beer cans, nip bottles, plastic and paper. According to the Captain at the Marshfield Conservation Area at the Union St Bridge, this area should be renamed "Tryst City." Lots of condoms and empty beer bottles were found, even though the area was cleaned up just a few weeks prior.

The Hanover Open Space committee tackled the Fireworks Property/Factory Pond Trail Site where they have been diligently cutting trails. Notable items they pulled out included 96 abandoned tires and a 6 ft. artificial Christmas tree complete with stand ribbon and decorations. The Hanover Canoe Launch was covered by foot and by boat. The Hanover DPW assisted us in hauling away the tires and



piles of trash.

The YMCA and the Jackson Family cleaned up around the Third Herring Brook in Hanover and Norwell and found some interesting items as well as the usual trash and liquor bottles. A vintage 1976 beer can commemorating the bicentennial (unfortunately not worth anything!), two marijuana pipes, a Coldwell Banker for sale sign and a set of ladies underwear obviously not from the same person! It does make you wonder what is going on in the watershed?!

The Marshfield South River crew found more trash than ever at Veteran's Memorial Park. At the Francis Keville Bridge area (behind CVS) they found at least 150 flattened beer cans that somebody had dumped as well as a couple of tires. At the Willow St Bridge area the usual nip bottles and trash were picked up and of course the traditional migratory shopping cart.

Most of the volunteers converged at the Driftway Park and enjoyed a great lunch of hot dogs and hamburgers with all the fixings compliments of Whole

Foods Market of Hingham. Clean Up Day Chairman and NSRWA Vice-President, Mark Norton, did his usual great grilling for the 17th time. Every year Billington Sea Kayak of Plymouth donates a kayak and paddle for the NSRWA kayak raffle where the winning ticket is drawn at Clean Up Day. This year's lucky winner was Michael McGowan of Scituate. Other prizes were also donated by MTI Adventurewear and REI. It is inspiring

to our organization to have so many dedicated volunteers come out and give up their Saturday to help the environment. It is great to see more and more families with children are coming to help.

Special Thanks to:

- Whole Foods Market of Hingham for providing delicious and healthy food for the cookout
- Billington Sea Kayak of Plymouth for donating a kayak and paddle for raffle
- REI for donating inspiring t-shirts to our volunteers and providing their own volunteers
- Scituate and Hanover Department of Public Works for hauling truck loads of trash
- Mark Norton for heading up this effort for the 17th time
- All the board members and volunteers who helped make this one of our best clean up efforts ever!

by Paula Christie

NSRWA EVENTS

Did You Know?

- The kayak was invented thousands of years ago by the Inuit people who lived in Arctic areas including Alaska, Canada and Greenland.
- The original kayaks (or qajaq) were made of sealskin stretched over whalebones and sealed with whale fat to waterproof. The word meant "hunter's boat," as the primary use of the boat was for hunting and transportation. They were built to conform to the body of the paddler so that they were actually "worn." The length of the boats were three times the length of the paddler. Paddlers were actually sewn into the kayak to protect them from the frigid waters if they flipped. They righted themselves by doing the "Eskimo Roll."

NSRWA'S 6th Annual Kayak Expo the Best Ever!



The popularity of kayaking has exploded as evidenced by this year's Kayak Expo. Over 800 people attended our 6th Annual Kayak Expo, smashing our past record high of approximately 700, and raising over \$8,000 for the NSRWA. The gymnasium and cafetorium at the Norwell Middle School were bursting with over 15,000 square feet of displays of kayak and row boats from classics to high tech, every kind of related gear, tour companies, paddling clubs, and four Standing Room Only slide shows. The 2008 vendors were more interesting and diverse than ever before, coming from as far as Maine, New York, New Hampshire and Rhode Island to display their goods and services.

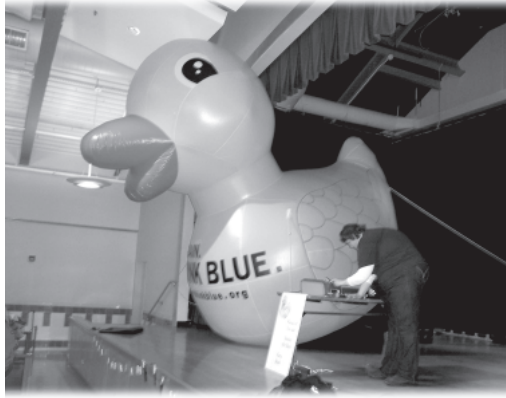
This year's event was even more family-friendly with the introduction of the Kids Corner, featuring "Stormy" the 15-foot inflatable duck and fun, educational activities for the many children who attended.

The NSRWA membership table, managed by board members, was hopping all day long. Eighty-five new members signed on to join our organization. Many of our wonderful volunteers helped out throughout the day and the night before setting up.

Special thanks to the NSRWA Kayak Expo Chairman, Roger Crawford, for outdoing himself this year; our board members and volunteers; and the vendors who make this a fun and colorful event worth attending ever year.

2008 Kayak Expo Vendors

5th Axis, LLC	Custom Kayaks by Steve	Osprey Sea Kayak Adventures
Bending Branches	Echo Rowing	REI
Billington Sea Kayak	EMS	Ski Market
Cal Tek	Kayak Centre	South Shore Boatworks
Compass Rose	Little River Marine	U.S. Coast Guard Auxillary Flotilla 12-8
Canoe Passage Outfitters	Maine Island Kayak Co.	Wampanoag Paddlers
Charles River Canoe & Kayak	Marshfield High School Boatbuilders	Warren Light Craft
Crawford Boatbuilding	MTI Adventure Wear	Wild Turkey Paddlers
Crosby New England Kayak Tours	Nantasket Kayaks	



Did You Know?

- Modern day recreational kayaking can be traced directly to an Englishman by the name of John Macgregor in 1865. He invented the covered canoe, now known as a kayak, that he named "Rob Roy." It was made out of wood.

- Kayaking became an Olympic sport in 1936 at the Berlin Olympics.

- Twenty five years ago Doug Gray, owner of Billington Sea Kayak, purchased a folding kayak by mail order since they were not available locally. According to him, the sport caught on in Europe first, and then on the West Coast of the U.S. Enamored with the kayak, Doug opened Billington Sea Kayak in 1986 to sell two brands of canoes and one brand of kayak. During that first year, he didn't sell a single kayak. From 1998 to 2000 Doug's kayak inventory doubled and has increased ever since then.

Kids Corner at the Kayak Expo

The Kids Corner, featuring Stormy the Duck, was a new addition to the Kayak Expo event list. There were four different activities available for children to explore:

- A coloring table where kids could draw their favorite watershed animal, plant, place, or activity for entry into our coloring contest (See winners below).
- A water cycle puzzle with pieces like "groundwater," "estuary," and "raindrops," and labeled arrows to connect them all.
- A model watershed constructed out of a large bag filled with sand that could be shaped to form ponds and riverbanks, then sprayed with water to show how watersheds work (including sponge wetlands to absorb runoff!)
- Pictures with Stormy the Duck, a 15-foot inflatable duck.

Thank you to all the volunteers who helped at the Kids Corner: Jonathan Jackson, Ellyn Einhorn, Alyssa and Janice Scoppetuolo, and Sarah Fuller. Thanks also to the Massachusetts Bays Estuary Association for letting us borrow Stormy!

Coloring Contest Winners



*Top Left:
Age 7-9
Luke Mallory, Age 8*



*Top Right:
Age 10+
Jamie MacFarland, Age 10*



*Bottom Right:
Age 4-6
Dylan Capaccioli, Age 6*

Ecological Tipping Points

Many of the projects that the NSRWA and Massachusetts Bays Program work on are restoration projects, such as restoring tidal flushing to a eutrophied coastal river. When we think about the idea of restoration, we like to imagine that we will restore an ecological system back to “the way it was,” to an ideal and probably more “pristine” state that existed in the past. However, this is not always attainable.

Ecosystems often have “tipping points” - a point in time or a state where it no longer becomes possible to get back to the state where the system started. The new state of the system is called an “alternative stable state.” It is important to remember that a natural system is always changing and responding, both to outside influences as well as the feedback of chemical and biological processes occurring within the system. When you imagine an ecosystem in a stable state, it is not static. In fact, some systems regularly cycle between multiple states (like a subtidal system that changes between being dominated by algae and barren rock, depending on the population dynamics of sea urchins that graze the algae.)

If a change, or perturbation, has the potential to affect an ecological system, the strength of the system’s response is related to how “resilient” the system is. This concept is often best illustrated by imagining a marble sitting in a valley between two hills (Fig. 1). As a change is made to the system, it can push the marble towards another valley. The depth of the valley, or how difficult it would be to push the marble over the hill, represents the stability of the system. The other valley represents an alternate stable state. Therefore, the severity of the effect of changes in an ecosystem depends both on

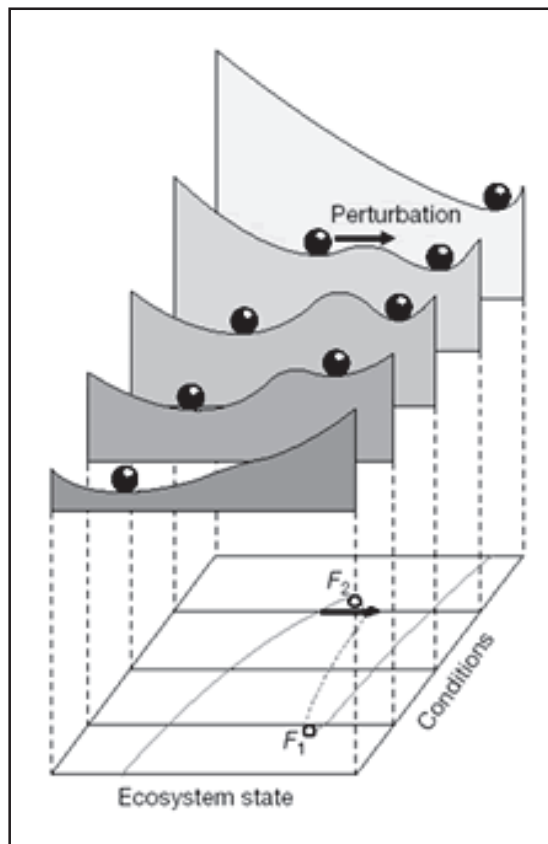


Figure 1: Scheffer et. al 2001

the magnitude of the change as well as the resilience of the system. A large enough change or a loss of resiliency in a system can push it towards an alternate stable state.

Imagine that this new stable state is not something that we think is ideal - we’ve applied value to the system based on ecological integrity, economic value, perhaps even aesthetics, and we liked it better before. Say we have an estuary that used to have relatively clear water and so seagrass was able to grow there relatively well. Now, septic systems and lawn fertilizer have contributed a lot of nutrients and the water isn’t as clear because excess algae and phytoplankton have grown there. The seagrass has died off because it can’t get the light it needs. We want to restore the system, so we say, “OK, let’s rewind the clock and clean up the water by reducing the nutrients that are going into

the water.” It sounds easy enough, but an alternate steady state has been created. The loss of the seagrass means that the bottom is more likely to be resuspended, which makes the water cloudy, brings more nutrients into the water, and prevents the seagrass from coming back. In addition the algae that has moved in is competing with the seagrass for space. The phytoplankton that bloomed with the extra nutrients makes great food for fish, which also help resuspend the sediment from the bottom. Even though we took away what was stressing the system in the first place, we can’t rewind along the same path - this is called “hysteresis”. Despite the fact that a perfect restoration may not be possible, there is always a chance to enhance or improve a system, and certainly making any effort to reduce stressors to an ecosystem will have some sort of impact. A local example of this is the First Herring Brook project. In that case, our first thought is to bring back the herring, and to do that we would need to balance the water needs of the fish with the water needs of the town of Scituate. It’s possible that even if the water in Scituate is managed in a way that is perfect for herring habitat and survival, the fish may not come back. Perhaps they’ve reached a tipping point and no longer consider First Herring Brook as a viable place to try to spawn. This doesn’t mean that we shouldn’t try to improve the brook at all - if flows are more regulated, it will help provide habitat for other species. That’s why we must approach restoration efforts carefully, and balance feasibility with the potential positive impact that we could have.

*By Sara Grady, PhD,
Watershed Ecologist and
Massachusetts Bays South Shore Regional Coordinator*

Watershed Invasive Species: Japanese Knotweed

Japanese knotweed (*Polygonum cuspidatum*) is an invasive plant originally from eastern Asia. It was introduced in the late 1800s as an ornamental, as well as for screening and erosion control. It goes by many other names: crimson beauty, Mexican bamboo, Japanese fleece flower, or Reynoutria are just a few. Unfortunately it spreads aggressively, primarily though rhizomes (underground stems), but also by seeds.

These plants can often be seen along roadsides in our watershed as well as in other areas of disturbance. The name “knotweed” comes from the appearance of the stems, which have swollen nodes (similar to bamboo) where the leaves meet the stem. Despite this appearance, it is not a bamboo, which is a true grass. The knotweeds are in the Family Polygonaceae and are more closely related to sorrel, buckwheat, and rhubarb. The stems are green with some reddish pink areas (similar to rhubarb). The leaves are large (~6") and broad, with a pointed tip. It can grow to 9-12 feet tall, and flowers in late summer with sprays of cream colored flowers. It is unlikely to be mistaken for any of the other knotweeds except for Giant knotweed (*Polygonum sachalinense*), which has leaves that can be twice as large (up to a foot in length) and has more greenish flowers.

Japanese knotweed is a problem because it tends to shade out other plants and creates a monoculture - an area colonized by only one kind of plant. It is often seen on river banks (such as the First Herring Brook downstream of Old Oaken Bucket pond) because it is very flood tolerant and quickly colonizes after floods scour away other plants.

Like many invasive plants, Japanese knotweed requires persistent attention if you want to eradicate it. It can be dug out, although you must ensure that all parts of the plant are removed because anything left behind will re-sprout. Digging out established plants is likely to be difficult due to extensive rhizome networks and roots that can penetrate to 9 feet deep. Removed plants should be bagged and disposed of in the trash. You can also cut the stems and apply a chemical herbicide (Roundup® or Rodeo®) but reapplication is often required as new seedlings sprout.



A close-up of Japanese Knotweed.



Japanese Knotweed grows along First Herring Brook in Scituate.

By Sara Grady, Phd.
Watershed Ecologist and
Massachusetts Bays South Shore Regional Coordinator

WATERSHED ECOLOGY

Facts About Stormwater and the Clean Water Act

- On the South Shore 58% of our rivers are not considered safe for primary recreation such as swimming and wading.

- Stormwater contains petroleum hydrocarbons (oil), sediment, nutrients (fertilizers like phosphorus and nitrogen), pesticides, herbicides and bacteria.

- 16 of the 17 South Shore embayments do not meet their designated uses under the Clean Water Act—in other words you can't shellfish there.

- As part of the Clean Water Act in April of 2003 every South Shore community was issued a 5-year permit from the EPA requiring communities to outline their plan to comply with the Clean Water Act. It is now 2008 and most communities have yet to implement fully the initiatives they promised to meet the requirements of the Act.

- If you would like to find out more about what your town is doing to comply, please visit www.epa.gov/region1/npdes/stormwater/ma.html to view your town's permit applications and annual reports.

Scituate Responds to NSRWA Call to Pass Stormwater Bylaw!

This past winter the NSRWA asked the Scituate Planning Board to place a Stormwater Bylaw on their town meeting warrant. The town had participated in developing the stormwater bylaw with the regional planning agency but had yet to take action. The Scituate Planning Board was in favor of the bylaw (by a vote of 3 to 2) while the Scituate Selectmen were against it (5-0). The Selectmen and Planning Board raised concerns that they and the public had not enough time to vet the bylaw . . . the NSRWA



disagreed and felt it was time to move forward. We sent out mailers and emails to our Scituate members and asked them to support the bylaw. The new stormwater bylaw will help to prevent further degradation of our water resources from new development by requiring a stormwater permit for any

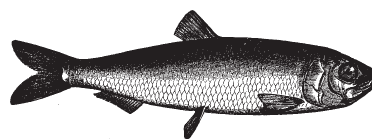
projects that will disturb more than 15,000 sq ft on any undeveloped parcel or a net increase of 25% or more impervious area on already developed parcels. Passing the stormwater bylaw helped Scituate comply with their Clean Water Act permit and

more importantly diminishes the impact of future stormwater on the First Herring Brook and North River watersheds. Thank you Scituate NSRWA members for passing the Scituate Stormwater bylaw at this spring's past town meeting!

*By Samantha Woods
Executive Director*

South River Herring Counts

This year for our herring counts we focused on the South River because we wanted to get good data on whether fish were using the relatively new ladder at Veteran's Memorial Park. We also wanted to use a more intensive Division of Marine Fisheries protocol that calls for 6-9 ten-minute counts a day, and so we needed to focus the efforts of our volunteer counters. We had a lot of volunteers this year, which was great, but not a lot of fish! We counted from April 1st to May



31st. A few fish were seen below the ladder intermittently from April 15th - May 6th, followed by a large pulse of up to 300 fish on May 20th. No fish were seen going over the ladder. We had a relatively cool spring, and that may have contributed to the late start - we usually start seeing fish in late April and early May, with the peak counts in the first two

weeks of May. Overall, there were less fish at ladders this year compared to last year in the region. Hopefully there will be more next year - please consider helping out! Thank you to this year's volunteers: Cam Brennan, Tom Hall, The MacFarland family, Alex Mansfield, Ramona Mansfield, The Morrison family, Renee Parry, Jay Wennemer, Gail Wills and Jeremy Wirth.

*By Sara Grady PhD,
Watershed Ecologist and Massachusetts
Bays South Shore Regional Coordinator*

The Dreams of a Caterpillar

I wonder what is running through her mind. She has had plenty of time to think, buried deep in her hole underground while the winter storms rage overhead. To look at her, you would think her quite idle, since she has not moved in months. So what else does she have to do but think?

In fact, she is very busy. Her time is spent breaking down many of her body parts and growing new ones. Out with the old and in with the new. Where before she walked, soon she will fly. Past meals were chewed. Future meals will be sipped. Her existence was once defined by tastes and smells. Soon her newly grown eyes will reveal a whole new world to her, a world of images and colors. Even her name will change from Tobacco Hornworm to Carolina Sphinx Moth. One of the few things she will carry with her into her new life is the name given her by scientists - *Manduca sexta*.

The question remains. What is she thinking? Is she remembering her first life? Two things - avoiding predators and eating, defined her existence. Avoiding predators so she could eat. Eating as much as possible and as fast as possible so she could make her way to the safety of her underground chamber before the predators found her. Tobacco hornworms have many predators. As one of our largest, juiciest caterpillars, hornworms make a great snack for a hungry bird or mammal. They also provide a convenient home for parasites - insects that lay their eggs inside the body of the caterpillar. These eggs will hatch and the larva will feed off the fluids of the caterpillar, dooming her to a slow lingering death. She must also avoid me - probably her least efficient predator.

Perhaps she is not worrying about predators, ignorantly bliss to the dangers surrounding her, instead reveling in the warmth of the sun and the gustatory de-

lights of her tomato plant. My tomato plant. She certainly seems to be enjoying her meal for she eats constantly, growing larger and larger, requiring ever more food until very little is left of my tomatoes.

Perhaps she is not remembering the past but dreaming of the future, the new life to come. If she is dreaming of the future, she must have a fantastic imagination. She will have to dream of an existence totally unlike anything she has ever experienced. With her poor caterpillar eyesight, she has probably never seen anything ever fly. Yet, soon after she emerges from the ground, she will have to figure out what her new wings are for and how to use them. When hungry, she will no longer be tempted by the bitter taste of the leaves of my tomato plants but will be irresistibly drawn to the sugary sweet smell of flower nectar. How will she know to uncoil her long straw-like tongue and daintily sip the strange liquid? When a male Carolina Sphinx Moth approaches with mating on his mind, she must decide that it is safe to let this stranger approach when most everything else that approaches is dangerous. And once they have mated, she must seek out just the right kind of leaves to lay her eggs on. If her eggs are laid on the wrong leaves, her offspring will starve.

All of these things she must be able to do instantly, with no guidance from parents. She has no opportunity to observe others and follow their example. If she gets any of this wrong, chances are she won't survive. Seems a lot to ask of a poor caterpillar turned moth. When asked to explain how insects can know these things, for it is an experience many insects go through, scientists say it is instinct. That, of course, just means that they don't know how insects do it. So perhaps they do remember the past and dream of the future. But until scientists can devise experiments to test if they have



memories and dreams, no one can say for sure.

In an experiment conducted in 2007, Tobacco Hornworms were made to walk through a glass tube. They came to a Y in the tube and could go either left or right. Wafting down one of the arms of the Y was a stream of air. The air coming down the other arm of the Y was scented with ethylene acetate, a fruity smelling chemical. The caterpillars showed no preference for either tube; half the time choosing the normal air and half the time the sweet smelling air.

In the next part of the experiment, every time the caterpillars chose the fruity air, they received a small electrical shock. As you might imagine, they soon learned to prefer the normal air, avoiding the tube scented with the ethyl acetate.

In the third part of the experiment, the scientists let these trained caterpillars pupate into moths and repeated the experiment. If the caterpillars were trained early in their caterpillar life, then as adults they showed no inclination to avoid the sweetened air. Clearly, they did not remember the training from their caterpillar days. However, if they were trained late in their caterpillar days, then they were able to remember their training and did avoid the sweetened air as adults. They can remember something from their past. This memory would be very important to a moth that must lay its eggs on the same kind of plant it fed on as a caterpillar.

A memory certainly is useful for many things in a moth's life, but what about the rest of it, those things still explained only by instinct? Now if scientists could just come up with a way to test for the dreams of a caterpillar . . .

by Don Salvatore

River Reading

(What the NSRWA Staff are Reading)

Gorgeously Green - 8 Simple Steps to an Earth Friendly Life

by Sophie Uliano

Thoroughly entertaining and chock full of great eco-friendly living tips for those who don't want to compromise on style and glamour.

Suburban Safari A Year On the Lawn

by Hannah Holmes

For the slightly more serious (and we do mean slightly) Suburban Safari takes you on a tour of one suburbanite's backyard ecosystem.



Do you want to create a green, healthy yard? Check out www.greenscapes.org. You'll find everything you need to know!

Do you want to know what you should do and when you should do it to have a green, healthy yard? Sign up for our e-mail newsletter, which comes 6 times a year, and explains in simple terms what should be done each month of the growing season. You can sign up at www.greenscapes.org.

No Discharge Area, continued from page 1

for a joint meeting of the Scituate and Marshfield Waterways Committees—one of the results of that meeting was a commitment from both to pursue the NDA.

No Discharge Area designations are already in place in Wellfleet, Chatham, Harwich, Hyannis, Falmouth, Nantucket, all of Buzzards Bay, the Connecticut coastline, Narragansett Sound, and the waters surrounding Block Island. There is currently an effort underway to designate all of Cape Cod Bay from

Marshfield to Provincetown.

This summer there will be more stringent rules in place to prevent pollution to our rivers and the coastal waters of Scituate, Marshfield, and Cohasset thanks in part to the hard work of the NSRWA, the Scituate and Marshfield Waterways Committees, Cohasset Harbor Health Committee, Coastal Zone Management and the Massachusetts Bays program. The NSRWA was also fortunate to be the recipient of a grant from the Bilezekian Foundation to develop infor-

mational pamphlets for boaters on the new NDA. Look for information on pumpout services and the geographic boundaries of the new NDA to be distributed through harbormasters, marinas and bait and tackle shops this summer!

by Samantha Woods



NSRWA Executive Director Samantha Woods speaks at the NDA Designation.



Attendees at the NDA Designation included representatives from EPA, CZM, the towns of Scituate, Marshfield and Cohasset, Mass Bays and NSRWA.

Watershed Notes

RED TIDE CLOSES SHELLFISH BEDS: In late May a red tide closed shellfish beds from New Hampshire to Sandwich, including the North River shellfish beds. Had this event not occurred the North River shellfish beds were scheduled to be open until June 1st this year. Red Tide is caused by an algal bloom of a dinoflagellate (*Alexandrium*) that causes Paralytic Shellfish Poisoning in humans who consume contaminated shellfish.

BILEZEKIAN FAMILY FOUNDATION AWARDS NSRWA \$2500 FOR OUTREACH TO BOATERS: The NSRWA was the fortunate recipient of a grant for \$2500 from the Bilezekian Family Foundation to provide outreach and education materials to boaters within the new No Discharge Area (see front page article). Look for brochures and laminated cards with information on the new NDA and finding pumpout services at local harbor masters' offices, bait and tackle shops and marinas.

NSRWA PARTICIPATES IN YMCA'S "DOWN THE DRAIN" EVENT: The NSRWA, the First Herring Brook Watershed Initiative and Scituate Rotary Club teamed up to participate with the YMCA at Mill Pond in Hanover to provide a fun opportunity for young adults to learn about watersheds and water conservation. Dubbed "Down the Drain," the kids received a "passport" that they would get stamped at different stations where they would learn and answer questions about watersheds and water conservation. Stations included a watershed model that kids could spray with water to see how water moves over the surface of the land, an exercise regarding stormwater, a water conservation station, a herring station, and information on the First Herring Brook and its flora and fauna. Everybody had a great time, parents got a bit of time off and the kids learned something about our watershed! Thanks to the Scituate Rotary, YMCA Teen Leaders and the First Herring Brook Watershed Initiative for a great evening.



FIREWORKS CLEAN UP: In February 2008, the DEP and Tetra Tech consulting engineers hosted a public meeting in Hanover to discuss the clean up options available to remediate the contamination leftover at the Fireworks site. The Fireworks Site is located adjacent to Factory Pond (an impounded section of the Indian Head River) in Hanover. Sediment in the pond and in adjacent tributary are contaminated with mercury, lead and antimony.

An ecological risk assessment showed the potential for significant risk to benthic organisms, fish reptiles, birds and mammals mainly due to the presence of mercury, lead and antimony. The greatest risks in magnitude and number to fish and wildlife receptors were in areas associated with historical sources of mercury and lead releases in the northern portion of the site. Risks for open water habitats and wetlands (Factory Pond) were more pronounced than upland areas of the Site. Risks to fisherman eating the fish from the ponds and river channels were indicated due to methylmercury accumulation in the fish. A fish advisory has been in effect since 1995.

The report concluded that the preferred proposal for remediation is to remove the most contaminated sediments in the northern portion of the site and to leave the lesser but still contaminated sediments that are at the bottom of Factory Pond. To fully dredge Factory Pond would have potentially significant more negative environmental impact than leaving it.

PROPOSED HERRING BROOK MEADOW 40B ABUTTING HERRING RIVER IN SCITUATE: The state ruled that no alternatives analysis was required through the Massachusetts Environmental Policy Act for this project. The NSRWA had submitted comments asking for an alternatives analysis. The remaining environmental permits in-

Watershed Notes

clude a wetlands permit that is being appealed by both abutters and the applicant to the state. A decision by the state Department of Environmental Protection will be forthcoming this summer.

NSRWA AND MASSACHUSETTS BAYS PROGRAM AWARDED EPA INTERN FOR THE SUMMER: The NSRWA and Mass Bays Program were fortunate to have been awarded an intern for the summer to work on a research project for the watershed. Hannah Bruce is going into her senior year at the Missouri University of Technology and Science and her bachelor's degree focus is Environmental Engineering. Hannah will be working on following up with the communities in our area to identify their progress in relation to their EPA stormwater permits.

NORTH AND SOUTH RIVER BLOGS: Kezia Bacon-Bernstein, former NSRWA board member, volunteer, Yoga by the River instructor and founder, Mariner contributor, newsletter graphics layout and all around fabulous person has recently posted her writing on the North and South Rivers on two blogs. This one includes her more polished writing from her college days: <http://northsouthriverstories.blogspot.com/>. And this one includes all of the nature columns Kezia has written for the Mariner Newspapers (Community Newspaper Company) since 1996 on behalf of the NSRWA. It will be updated monthly: <http://keziabaconbernstein.blogspot.com/>.

SCITUATE MOVES FORWARD WITH DRIFTWAY TRAIL: The Town of Scituate voted at this past Spring Town meeting to allocate money from Scituate's Community Preservation funds to complete a portion of the Driftway Trail that will:

- Complete the bike and pedestrian trail from Scituate Harbor to the Driftway
- Refurbish the railbed trail to the First Herring Brook from the new parking and picnic area at the trailhead next to the Dunkin Donuts
- Connect and make new trail from James Landing to existing railbed trail to restored salt marsh (mitigation project for MBTA).
- Design, engineer and permit a potential footbridge across Herring Brook to provide trail access to North River.

BRIDGE REPAIRS: Sea Street Bridge - The South River is navigable by boat however there is concern that with widening of the Sea Street Bridge that there are now areas of the channel that are shallow and potentially unnavigable! Please take note of the markers in the channel noting the depth danger. Expected date of completion is November.

- Union Street Bridge - Funding has been allocated in the transportation improvement plan for this year. Date as yet to be determined for construction to begin.
- Old Washington Street Bridge Repair Work - There is scheduled work on the Old Washington Street Bridge pointing and abutment erosion repair. Date for construction to begin as yet to be determined.

HANOVER UPDATES WETLANDS BYLAW AT TOWN MEETING - THANK YOU NSRWA MEMBERS!
Thank you to our Hanover members who took heed of our call to attend Hanover's May 5th Town Meeting and support the Hanover Conservation Commissions' updated wetlands bylaw.

Want to get reminders about our events and issues?

Sign up for our Rivernet Email news.
Send a blank email to RiverNet - subscribe@lists.nsrwa.org
or go to our website at www.nsrwa.org and click on Rivernet.

NSRWA's Summer 2008 Events

To sign up or
for more information
contact us at
781-659-8168 or
paula@nsrwa.org

Yoga at the River's Edge

Saturdays at 8:30 am
June 14 - September 20

Join yoga teachers at outdoor sites to relax, stretch and breathe. *Suggested donation per class: \$10. No classes on rainy days. Visit our website for more info.*

North & South Rivers Art Show

October 7 - November 22
South Shore Natural Science Center
Jacobs Lane, Norwell

Come view the beautiful artwork of the North & South Rivers by award-winning local artists and supporters of the NSRWA. This is a must-see exhibit for lovers of the rivers. Opening reception is Saturday October 11, from 2-4 pm.

Wildlife Photography on the Upper Reaches of the North River

Sunday, July 20th, 8:30 am

Join NSRWA board member and photographer Andy Hebert for a morning paddle and wildlife photography session. Share tips on photographing wildflowers, birds and dragonflies on this leisurely paddle. Later we will each choose 2 or 3 of our best shots to share on the NSRWA website. *Bring a waterproof camera or dry bag for your camera. Meet at the Hanover canoe launch at 8:30. Pre-registration required. Limit 10 participants. Suggested donation: \$5.*

Discover Algae (Seaweeds) at Low Tide

Saturday July 26
11:00am-1:00pm

Join Ellyn Einhorn and Carolyn Sones as they search for algae along the tide line and amongst the rocks & tide pools of Rexhame Beach. We'll look at color, shape and habitat and try to identify our collections. We'll mount and press our favorite specimens to preserve them. *Meet at Rexhame Beach parking lot at 11:00. Wear "tide-pooling" shoes (sturdy but able to get wet). The program is limited to 20. Children with an adult are welcome. Pre-registration is required. Suggested donation is \$5.00.*

Rexhame Dunes Plant Walk

Sunday, September 21
9:00-11:00am

Plant life in the Rexhame dunes shifts through a number of different habitats from river bank and salt water marsh to upland dune and ocean beach. There is a lot of diversity with each plant claiming its own unique setting - or is it each setting claiming its own unique plants? Join Ellyn Einhorn & Carolyn Sones to explore the different habitats and their plant life. *Meet at the Rexhame Beach parking lot at 9:00. The program is limited to 20 participants. Pre-registration required. Suggested donation: \$5.*

Full Sturgeon Moon Rise Paddle

Thursday, August 16

Join us for a paddle by the light of the Full Sturgeon moon. We will paddle as a tight group to the Spit to watch the full moon and share a story or two. Please bring a flashlight or two for each boat. *Pre-registration and PFD's are mandatory, as the paddle is limited to 10 participants. There is no on-site registration. Suggested donation is \$10/person.*

Kayak Camping Trip Among the Isles of Maine

September 6th - 13th 2008

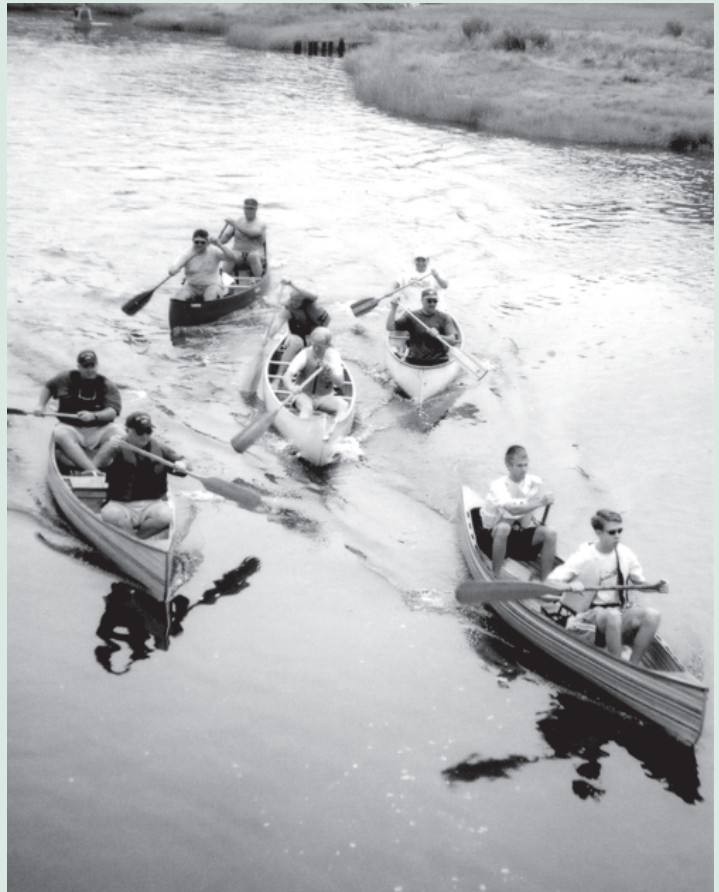
Join us on this weeklong, all inclusive sea kayak camping trip vacation among the Isles of Downeast Maine. A typical day could start with crepes with Maine blueberries and fresh brewed coffee or tea delivered to your tent, followed by a stretch and yoga. Then go for an exploratory paddle among the dozens of isles off the village of Stonington. Stop for a picnic lunch and a short hike to vantage points, where we can see Acadia and Penobscot Bay. We'll arrive back to camp in time for a glass of wine and a dinner that will include organic vegetables grown just a stone's throw away. We will finish each day with a relaxed evening under the stars. We will pick up camp and move to another island on one of the days to add to the sense of adventure.

This fund-raising trip is designed for all kayaking abilities and recognizes that participants are on vacation. We will emphasize fun as we include activities like Natural History, kayaking skills and outdoor baking classes! Your Guides/Hosts will include among others, Carolyn Sones and Doug Lowry, NSRWA Board Members and long time paddlers. Doug leads paddles to many exotic locales and is a trained kayak trip leader through the National Outdoor Leadership School. The price is \$1,000 per person. Call the NSRWA at (781)-659-8168 to sign up or for more information or email douglowry@mac.com Visit www.nsrwakayakexpo.org to check out more photos of this fabulous trip!

Calling All Paddlers!

THE GREAT RIVER RACE

Saturday August 2,
2008



NSRWA's 18th Annual River Challenge & Great River Race
To benefit the North & South Rivers Watershed Association

Watch for your registration and sponsorship forms in the mail.

For more information or to download a form visit www.nsrwa.org



RiverWatch

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