



# LAKE TIDES

*The newsletter for people interested in Wisconsin lakes*

**Volume 24, No. 4**  
**Fall 1999**

## **A Different Vision** *Native plants or nuisance weeds?*

*Your vision of place was different. You saw your land as a link in a living chain, vital to the ecological health of your lake. Just as a monarch butterfly emerges, metamorphosed from its chrysalis, so too had your lakefront property undergone a transformation. Gone were the plastic pink flamingos that the previous owner proudly displayed. Also gone was the green carpet of lawn that spread from property line to property line and the day-long appointments with the lawnmower.*

*It was no simple task! Even so, ten years have passed since you acquired the property and it is now a place of great natural beauty. Working with a local landscaper, you developed a restoration plan which combines native species plantings with a "no-mow" approach. Gone are the nuisance geese and muskrats; they have been replaced by songbirds, turtles, frogs, mink, and even an otter earlier this summer. Replacing the lawn at the water's edge is a kaleidoscope of botanical color—blue flag iris and cardinal flowers grace your shoreline. Native grasses and shrubs cover the ground under the trees that survived the previous owner's tenure. A winding path leads down to the lake from your home, showcasing the work that you and Mother Nature have accomplished.*

*Then, one day, a letter arrives in the mail. Apparently, a complaint was voiced at a recent town board meeting about your property being overgrown with "weeds." The letter informs you that under the local weed ordinance, you have two weeks to trim the "weeds" on your property or the town will do it and you will be assessed for the cost of removal.*

As the concept of a natural shoreline grows in popularity among Wisconsin's waterfront property owners, so too does the potential for friction with local weed control ordinances. What one person sees as a natural shoreline with benefits for water quality, wildlife and fisheries habitat (not to mention less time spent on the lawnmower), another person perceives as a mosquito-infested "jungle" that's in need of a good trim.

Many communities have adopted weed control ordinances intended to ensure that landowners maintain their lawns and properties in an "acceptable" condition. In most cases, these ordinances originated from agrarian noxious weed control laws that were intended to regulate plants perceived as harmful to agricultural operations.

Unfortunately, many weed control ordinances were put on the books at a time when the benefits of a natural shoreline were not well-known. These ordinances do not contain provisions which encourage well-intentioned waterfront property owners to restore or protect native shoreline vegetation. In fact, some property owners have faced enforcement action because their shore-



**Wisconsin Lakes  
Partnership**





### Natural yards can mean less work

lines were left in a natural condition.

So, what should a waterfront property owner do if problems are encountered when trying to protect or restore a natural shoreline? According to Wisconsin DNR Attorney Linda Meyer, property owners may be able to argue that the town, city or village is preempted from enforcing an ordinance that requires the cutting of shoreline vegetation.

Wisconsin courts have established that a local ordinance is invalid if it has the effect of frustrating a comprehensive regulatory policy established by the State Legislature. If the property:

- is located in an unincorporated area (that is subject to a county shoreland zoning ordinance); or
  - is in an area that was annexed to a city or village after May 7, 1982; or
  - was incorporated after April 30, 1994, and is subject to shoreland zoning under section 59.692(7), Wis. Statutes,
- the local unit of government can not legally enforce an ordinance that conflicts with the vegetation cutting restrictions of the shoreland zoning ordinance (NR115). There is case law that supports these principles.

For example, in *Oneida County v. Converse* (1993), the court of appeals held that:

"A local ordinance is invalid if either (1) express statutory language has withdrawn, revoked or restricted the municipality's power to issue such ordinance, (2) the challenged ordinance is logically inconsistent with the state legislation, or (3) the challenged ordinance infringes on the spirit of a state law or general policy of the state."

The second and third criteria summarized in the *Oneida County v. Converse* decision could apply to local weed control ordinances which effectively prevent property owners from complying with shoreland zoning ordinance standards enacted by the state Legislature. The Legislative directive, found in section 281.31(1), Wis. Statutes, recognizes a need to "reserve shore cover and natural beauty" in the shoreland areas of navigable waters.

What if your property lies in an area not subject to shoreland zoning under State statute? It still might be possible to convince the local weed control officials or the governing body of the city or village (which has the authority to amend the weed control ordinance) that it does not make sense for the city or village to require the cutting of vegetation that has such beneficial effects. Check with your local DNR or County Extension office for informational brochures on the benefits of shoreline vegetation—and then share these with your local officials.

Current state laws dealing with weeds are being revisited for possible updates. A Technical Advisory Committee has been working to develop recommendations for a new weed law. One possible outcome of this process could be the drafting of updated model weed control ordinances which include provisions allowing for shoreline restoration using plant species which are noninvasive or native to the area. For more information, contact the Wisconsin DNR (608) 266-7012 or write to Endangered Resources, WDNR, Box 7921, Madison, WI 53707-7921. Additional information can also be found on the web at [www.dnr.state.wi.us/org/land/er](http://www.dnr.state.wi.us/org/land/er)

by John Hagengruber (WDNR) with contributions from Linda Meyer (WDNR)





A Technical Advisory Committee (TAC) composed of representatives from industry, landowner and conservation groups, as well as key state and local government agencies, has been working to develop recommendations for a new weed law. The effort to revise the current laws concentrates on preventing establishment of new noxious weeds, or spread of noxious weeds into areas currently uninfested by these species. It stresses education and voluntary cooperation between landowners, affected industries and various levels of government.

**A few of the key points of the recommendations include:**

- Developing a comprehensive statewide invasive plant program focusing on education, prevention, control and voluntary cooperation.
- Appointing a Noxious Weed Council.
- Local enforcement with assistance from county and state agencies, including annual training.
- Financial and technical assistance to landowners for the control of prohibited noxious weeds.

Although the current recommendations do not specifically address the unique problems of aquatic weeds, they do establish a category of noxious weeds that would make it illegal to sell or distribute certain weeds, or transport them from one area to another. Many aquatic weeds would likely fit into this category. The committee would like input from lakeshore owners and lake associations on how the law could be improved to specifically prevent the spread of milfoil and other aquatic weeds and control existing infestations.

Comments on the **draft recommendations are due November 15, 1999**. The TAC will make revisions, taking public comments into account. Everyone submitting comments will be kept informed of the progress of the effort as it makes its way through the law-making process.

**To obtain your copy of the draft recommendations for weed law program revisions:**

Call or write for a paper version at 608-266-7012 or Endangered Resources, WDNR, Box 7921, Madison, WI 53707-7921. To obtain an e-mail with attached documents contact: [endanb@dnr.state.wi.us](mailto:endanb@dnr.state.wi.us). Or, find the text of the noxious weed law draft recommendations on the web at: [www.dnr.state.wi.us/org/land/er](http://www.dnr.state.wi.us/org/land/er).

## Comments sought on revisions to Wisconsin's weed laws



One of our lake partners has shifted to another job. **Jim Leverance**, who has held the position of DNR Lakes Coordinator in the South Central Region for the past eight years, has taken on a new role as a Lower Rock River Basin Sub-Team Leader. Jim is well known in the lake communities of Southern Wisconsin. Jim's easy going manner and eagerness to lend a helping hand earned him the respect and admiration of his peers. He served statewide on many committees and teams and worked to strengthen lake management organizations. Jim garnered 70 lake planning and protection grants totaling nearly \$3 million for this Region. Of special note, 500 acres of land was purchased with these grants to protect South Central's lakes—more than any other region in the state. As a member of Wisconsin's Lakes Team, he contributed to the development of our Lake Grant Programs, the Shallow Lakes Initiative, Aquatic Plant Management and Protection, Lake Education and Awareness and Citizen Involvement. The Department is working on refilling Jim's position. *Good Luck and thank you for all those years, Jim. We will miss you. I'm sure we will see you around the lakes.*

## New Places, New Faces

We'd like to welcome **Becky Aarestad** who has joined the Lakes Partnership Extension Office at UW-Stevens Point. Becky and her family recently moved to Stevens Point from the Milwaukee area. They have always enjoyed Wisconsin's best resource—water—and she's excited about working with people concerned with the future of Wisconsin lakes. Becky brings a broad background in people and office management skills to the Lakes Partnership. She will be working half time, answering your calls and trying to meet your needs along with Dorothy Snyder while Dorothy divides her time with her new position as Project WET coordinator.





# The spirit of lakes

## The People, the Politics, and the Passion

**Wisconsin Lakes Convention, March 9, 10, 11, 2000 — Stevens Point**

*Time is very important to humans. We seem to find comfort in the calendar as we journey through our lives. The 2000 Wisconsin Lakes Convention will help us mark time in many ways. It will be a time to reaffirm our commitment to leave a healthy legacy of lakes for those that celebrate the next millennium. It will be a time to celebrate the past and a time to plan for the future. Attend the largest convention of its kind in the nation.*

*Attending the state Lakes Convention is one of the best investments you and your lake group can make for your lake.*

**Mark your calendars...** The 2000 convention will focus on our role in public policy and public works and on ways to awaken the natural spirit in each of us. The Lakes Convention is a forum where much of the knowledge and people of Wisconsin's lakes come together for three special days. If your interest in lakes is new or if you are a seasoned veteran, you can learn and share much in this short time period. Experts and enthusiasts from around the state will gather to learn, share and discuss policy needs for Wisconsin lakes. The array of topics covered is always broad... from water law to science, from social concerns to the latest in technology. Talk to the individuals in your lake organization and bring as many members as you can in March. Attending the state lake convention is probably the best investment your lake group and you can make in maintaining the well-being of your lake. *Look for additional convention details and registration forms in the January Lake Tides.*

### Keeping an Edge on Lakes

#### *Understanding, Protecting and Restoring Wisconsin Wetlands Thursday, March 9th Pre-conference Technical Session*

More and more people understand the importance of wetlands to our nation and our state. Recent flooding in the Carolinas has emphasized the impact that loss of wetlands and building in floodplains can have on a society. Wisconsin has lost half of its wetlands. A portion of the remaining wetlands are degraded, but others provide some of the most beautiful and biologically important parts of our landscape. Even degraded wetlands can provide essential ecological services by protecting downstream waters. If you are interested in learning more about ways to protect and restore wetlands, this technical session is imperative. Learn about Wisconsin's wetland heritage and history in our morning general session. Sign-up will be required for the specific afternoon break-out sessions that will provide in-depth information on the following themes:

##### **Wetland Wildlife:**

- Biology and habitat needs of wetland critters, from bugs to birds, frogs, snakes and salamanders.
- Tips on wildlife viewing and opportunities for involvement in citizen monitoring programs.

##### **Wetland Restoration and Management:**

- Small-scale to large-scale restoration techniques and case studies, landowner stories, and methods of invasive species control.
- Ideas and contacts for restoring wetlands on your property or getting involved in fighting invasive species.

##### **Wetland Protection:**

- Wetland rules, regulations and key players.
- Case studies of effective citizen action to protect and preserve wetlands.





## “Hotaru” Of Fireflies and Loons...Creating the Knowledge

Wisconsin has a national reputation as a place where scientists and citizens, agencies and local organizations work together for positive change. The Wisconsin Lakes Partnership is a prime example of experts and enthusiasts working together with a common goal of preserving and protecting the Badger State's lakes. People here understand that the best decisions are made at the local level by the folks who will have to live with the outcomes.

We are not the only folks who feel this way. This summer, Wisconsin had the pleasure of being visited by a team of four Japanese researchers—two professionals and two housewives—who are part of a water and culture study group. They live and work near Lake Biwa, a lake about the size of Wisconsin's Lake Winnebago. The big difference is that 14 million people live around Lake Biwa, while the entire population in the state of Wisconsin is less than 5 million. The study group had heard about our partnership and wanted to share information about their own.

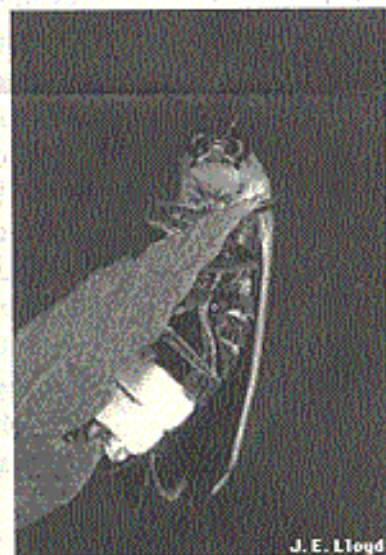
In Japan, residents were very concerned about water pollution, but needed more information in order to deal with the problem and improve the situation. They realized that much of the lake's pollution came from household sources and these sources had increased since public sewer and water systems had been introduced. The residents believed that solutions would require community collaboration and involvement. In the past, the rivers and lakes of Japan were cleaner because people's life styles required clean water from the river to drink and use for cooking. Waste water was reused for feeding fish and fertilizing fields. In those days the rivers running into Lake Biwa had been full of fireflies

In 1989 a team of environmental experts formed a research group called Mizu to Bunka Kenkyu Kai, Water and Culture Group. The researchers hoped to monitor water quality in Biwa and involve community volunteers in the process. The group wanted to work with a living creature that would be a good biological indicator of water quality, familiar to the general public, easy to identify and count. In Wisconsin, we have used the loon; Japan picked the firefly, which is called *Hotaru*. Fireflies have historically been recognized in Japan as insects of value to humans because of both their ability to emit light and their preference for an uncontaminated water environment.

The firefly research project turned out to be one of the most successful cases of resident-participation and interest in the water environment in Japan. Over the past 10 years more than 3000 people have taken part in the survey with over 40,000 days of observations. The firefly research has persuaded people to pay more attention to their neighborhoods. Formerly, people seldom walked around at night and would use their cars even for short trips. Counting fireflies encouraged people to venture out into their neighborhoods, observing nature.

*The Japanese people of the Lake Biwa region believe that improvements in the local environment can be accomplished after the residents have gained some understanding of the issues through their own observations and discoveries. Thanks and good luck to Yukiko Kada of the Lake Biwa Museum, Dr. Mima Nishiyama, Reiko Okada and Ikuko Kosaka. You can visit their website at: <http://www.iclei.org/leicomm/lei-036.htm>*

*Local government units in Japan (comparable to our towns and counties) are not square; they are in the shape of their watershed. When asked how long Japan had been basing government boundaries on the flow of water across the land, the simple answer was... about 1000 years.*



J. E. Lloyd

*"Hotaru" implies warmth and harmony between humankind and all creatures sharing the planet.*



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# What's In a Name?

## Dragonflies

*Devil's darning needle...horse-stinger...mosquito hawk... Whatever you want to call it, the dragonfly is a master of the sky, curiously dropping in from nowhere, mysteriously disappearing in an instant, eluding capture by its swiftness and agility.*

Dragonflies have long been the object of fear and superstition, hence their name. They are members of the Order Odonata, from the Greek word *odon*, meaning tooth. Dragonflies have strong jaws with sharp teeth. Fear not, though, dragonflies are harmless unless you happen to be a mosquito or other little insect. And contrary to popular belief, dragonflies do not have stingers.

Dragonflies live near any body of fresh water and actually spend 90-95% of their life in the water as aquatic larvae or nymphs. You may have come across long threads of dragonfly eggs in the water. Eggs are also laid in plant stems and soft mud and, depending on the dragonfly species, will either overwinter or hatch in five to ten days. The nymphs lead a busy life, shedding their exoskeleton eight to 16 times until they reach maturity. It may take one to three years for them to reach their full size of  $\frac{3}{4}$  to 2 inches, again depending on the species. Pond species tend to take less time than river species.

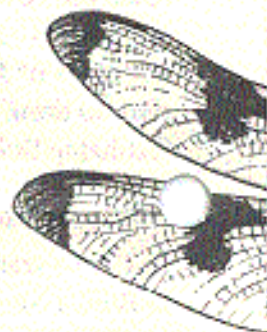
As you can imagine, the nymph undergoes an incredible transformation to become the beautiful dragonfly that graces our waters. It is triggered by warmer temperatures and increasing daylight for spring species that emerge in May and June. Summer species emerge more sporadically throughout late June, July and August. The nymph stops feeding and the process begins. Its mouthparts dissolve, its eyes become translucent and its wing pads swell. The nymph will then crawl out of the water and use its feet to anchor itself to a rock or plant stem. After its exoskeleton splits, the dragonfly will draw in a big breath of air, pumping up its body out of the larval skin and unfolding its wings.

The rite of passage into an adult dragonfly takes place over the course of several days. The flight season of a dragonfly varies from several weeks to two years, depending on species and weather conditions. A few dragonfly species actually migrate south in the fall.

Close your eyes and picture a dragonfly. What do you see? You probably picture a colorful body and four symmetrical, cellophane-like wings sticking straight out to the side. Dragonflies are the only insects with a flight muscle directly attached to the base of each wing. Each species of dragonfly has its own characteristic wing vein pattern, which can help in identifying them. Your mental image of a dragonfly probably also includes big eyes. In fact, in proportion to the rest of its body, the eyes of a dragonfly are larger than any other animal. Each eye contains nearly 30,000 lenses enabling it to see in almost every direction.

Wisconsin is home to six families of dragonflies, affectionately known as skimmers, cruisers, clubtails, spiketails, emeralds and darners. Among the 108 dragonfly species in

*Skimmers,  
cruisers,  
clubtails,  
spiketails,  
emeralds,  
darners... these  
are the names  
of dragonfly  
families in  
Wisconsin.*



*Whalen*





these Wisconsin families, six are on our endangered and threatened species list. One of these, the Hine's Emerald Dragonfly (*Somatochlora hineana*), is also federally endangered. It is distinguishable by its brilliant emerald eyes, dark brown and metallic green thorax and two creamy yellow lateral lines. The other endangered emerald in Wisconsin is the Warpaint Emerald Dragonfly (*Somatochlora incurvata*). This species has a dark face and shiny black upper lip called a labrum.

Darners are brightly-colored, clear-winged dragonflies. One darter is endangered in the state, the Spatterdock Darter Dragonfly (*Aeshna mutata*). It is mostly deep blue in color, including its very large eyes. The remaining species on Wisconsin's list are snaketails, which are in the clubtail family. They have an enlarged area near the tip of their abdomen "tail". The Pygmy Snaketail Dragonfly (*Ophiogomphus howei*) is the only threatened species in the state. It has a small olive green body with brown stripes and bright yellow markings. The Extra-striped Snaketail Dragonfly (*Ophiogomphus anomalus*) and the Saint Croix Snaketail Dragonfly (*Ophiogomphus susbehcha*) are both endangered. The Extra-striped Snaketail's head is green on top with black on the outermost angles.

Factors contributing to the disappearance of these dragonflies are many and include dams, dredging, draining, pollution, sedimentation, and shoreline modification. Water quality contamination by pesticides and development of land for agriculture and recreation may also be limiting their survival.



The distribution of most of these dragonflies in Wisconsin is limited to one or two counties. For instance, the Spatterdock Darter is only known to exist in three ponds in Marquette County. The Hine's Emerald is found only in the northern half of Door County. The snaketails are a little more dispersed across the northern and northwestern Wisconsin rivers. Keep your eyes open for snaketail exuviae (larval skin) if you are in these areas in late May or early June. They are usually found in the water within a few feet of the shoreline, especially where there are steep banks and overhanging trees.

Dragonflies are an eye-catching part of our water ecosystems. It can be fun to learn more about the critters with which you share your lake frontage. Visit your local library for more information about the fascinating world of dragonflies. A good source of information is the brand new book, *The Endangered and Threatened Invertebrates of Wisconsin* (PUB-ER-085-99), published by the Bureau of Endangered Resources, Wisconsin Department of Natural Resources. A particularly good article, by MaLenna S. Smith, may be found in the June 1991 issue of Wisconsin Natural Resources (Vol. 15, No. 3). Also check out web sites on dragonflies. An interesting site is: <http://stephenville.tamu.edu/~fmitchel/dragonfly/links.htm>

Contributed by Marilyn Leffler, UWEX/DNR with illustration by Chris Whalen, UWEX.



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## Bird's Eye View

by Maureen Janson, Self-Help Lake Monitoring

In Southern Wisconsin, dressed in its winter best, a sleek silver grey loon quietly dives to the bottom of a lake looking for a snack. Nearby, a handful of cormorants pass overhead soaring in a loose vee formation with their necks outstretched. The return of these birds to the lower part of the state reminds us that soon the lakes will freeze over and we will retire our Secchi disk to the basement storage room until ice-out next spring.

Part of determining the overall health of a lake is to observe the wildlife around and on the lake. The presence of migrating birds can be an indicator of changes in water quality. Fishing birds (great blue heron, kingfisher, bald eagle, osprey) rely on keen eyesight and clear water to feed themselves.



The osprey, bald eagle and kingfisher, along with several other species of freshwater birds plunge into the water to spear their catch. A great blue heron or green heron will forage in shallower water and stand stock-still to use its long neck to dip down several feet and grab a tasty minnow. When Northern shovelers arrive, they flock up in a spot on the lake where algae sit on the surface. Like little wind-up toys, shovelers skim the top layer of water for their food, making good use of what we sometimes consider an unsightly presence in a lake. Coots and goldeneye ducks will dive to depths of up to 20 feet to munch on aquatic plants visible from the surface.

In addition to feeding, many duck species, geese and swans nest on and around lakes. Shoreline development reduces the likelihood of loons setting up their summer home on a lake. Even

removal of dead trees can take away a perching place for a kingfisher on the hunt, or cause an osprey to reside elsewhere.

Wildlife observations can supplement a water clarity measurement and could some day help determine long term trends. A changing Secchi reading could determine whether or not that green heron will return to fish your shoreline next year. So why not grab the binoculars next time you head out for lake monitoring duties? You'll learn even more about the vast ecosystem of a freshwater lake, and you are likely to see some beautiful creatures pass through Wisconsin



## Leap into Lakes... Dipping the "disk"

Forty-eight water-lovers traveled to Wisconsin Dells on Sept. 24-25 to receive training and equipment to begin 17 new Adopt-A-Lake projects across the state. From Burnett and Marinette county all the way to southern Waukesha county, public schools, girl scouts, church organizations, 4-H leaders, Extension Agents and youth rehabilitation centers are celebrating a new age of lake stewardship.



Training was supplied by Water Specialists Laura Herman, Cathy Cleland, Sandy Wickman (DNR Rhinelander), Scott Szymanski (DNR Green Bay), Brad Johnson (DNR Wausau), Dorothy Snyder (Project WET coordinator) and Laura Felda (Adopt-A-Lake coordinator).

These teams will monitor dissolved oxygen, pH, and temperature; take Secchi disk readings; perform phosphorus screening; and plant and macroinvertebrate identification.

**Look out lakes, here they come!**



### Triple "D" the Water Cycle

YO, YO, YO mellamo double drip drop,  
I'm here to tell you, about where I stop  
I started out, up in the cloud  
Then thunder, lightening it all was quite loud.  
I fell on down, into the ocean.  
My skin got rough, I used some lotion  
But then a boat, came out I grabbed it  
I came on to land, right by some dog kennels,  
A dog slurped me up, oh what a blast,  
And now I've ended up, right in some grass.  
That's my story, I hope it, you didn't hate!  
(Break it down) Now everyone EVAPORATE!

Written by Alex Ordway

Leap Into Lakes Workshop, 1999

### New Coordinator for Project WET-Wisconsin

Dorothy Snyder has been named the new statewide coordinator for Project WET (Water Education for Teachers). This international, interdisciplinary water science and education program promotes the awareness, appreciation, knowledge and stewardship of water resources through the development and dissemination of classroom ready teaching aids for use by formal and nonformal educators. If you're interested in learning more about Project WET and its facilitator network, call Dorothy at 715/346-4978 or email [dsnyder@uwsp.edu](mailto:dsnyder@uwsp.edu). Let's get WET in Wisconsin!

# Adopt-A-Lake/Project WET



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## Items to Note in the Wisconsin 1999-2001 Biennial Budget

As *Lake Tides* goes to press, the Governor has not signed the state budget. If it passes unchanged, some exciting opportunities await our state's waters and the lands around the

### • Land Use Planning and Protection

The state budget includes historic initiatives known as "Smart Growth" in terms of land use planning for local units of government. The law outlines a framework for the adoption of a comprehensive plan by cities, villages, counties, towns and regional planning commissions. Every plan must address certain issues such as transportation, land use, housing and implementation strategies. Under the law, goals, policies and programs for the conservation and effective management of natural resources would have to be described. After 2010, many local decisions relating to zoning, annexation and subdivision planning will need to be consistent with a local comprehensive land use plan.

The reauthorized Warren Knowles-Gaylord Nelson Stewardship 2000 program was granted \$460 million to fund land acquisition over the next 10 years. This amount doubles the existing program budget. In addition, the budget includes initiatives to target wild lakes, Great Lakes bluffs, the Baraboo Hills and the purchase of conservation easements.

### • River Protection Program

The budget includes a new rivers grant program. While the nonpoint source program focuses on restoration activities in urban and agriculturally dominated watersheds, no programs exist to protect rivers and streams with good water quality. The lake program fills this gap for lakes; it was reasoned a similar model was needed for rivers and streams. The present proposal allocates \$300,000 towards the rivers grant program.

Modeled after the lakes program, the river program funds both planning and protection projects. Some of the activities eligible for funding under a planning grant include data collection, nonpoint source pollution evaluation, informational and educational initiatives and organizational assistance. Potential river protection grant activities consist of land or conservation easement acquisition, restoration of in-stream and shoreline habitat, and ordinance development.

### • Lake and Lake Ecosystem Protection

The bill also expands on the kinds of projects that can be covered under lake planning grants. A new subcategory of grants would provide funding for assessment of the nonpoint source pollution potential and use of surrounding lands, fish and aquatic life, and for education on the use of lakes and the surrounding lake ecosystem.

## Where in the World-Wide Web???

*Lake Tides* would like to share some interesting lake and water related web sites:

**Water on the Web**, University of Minnesota-Duluth <http://wow.nrri.umn.edu/>

**NOAA Coastal Ocean Program** <http://www.cop.noaa.gov/pubs/newsletters.html>

**Wetlands Reserve Program**, USDA Natural Resources Conservation Service <http://www.wlfb-nct.org/>

**Living Plant Report**, World Wildlife Fund <http://www.panda.org/livingplanet/lpr99/>

**Enviromapper**, EPA <http://www.epa.gov/enviro/enviromapper.html>

**Groundwater Atlas of the United States** <http://www.capp.cr.usgs.gov/publicdocs/gwa/>

**Climate Data Online** <http://www5.ncdc.noaa.gov/7777/plclimprod/plsql/poemain.poe>





The last issue of *Lake Tides* featured an article "One Bath in the Lake... The Soap Opera." The article addressed the philosophy of bathing and soaping up in our lakes. We received a number of letters, e-mails and calls. The following is an example.

I appreciated seeing your article on bathing in the lake and the effect of soap in aquatic ecology... but maybe you didn't go far enough. In addition to the effects on dissolved oxygen (DO) due to biodegradation, other adverse effects are manifest whenever we release chemicals foreign to an aquatic ecosystem.

First, consider the many forms of "soap" likely to be released into a lake. In addition to the typical bar of soap composed of lye and some kind of fat such as vegetable oil or non-edible animal tallow, there are detergents, shampoos, and insecticidal soaps used on plants and pets. Each has its unique chemistry and therefore each can pose one or more additional risks to the lakes receiving them. We can group all such soaps into a more technical term, surfactant.

Surfactants typically assist cleaning by one or both of the following physical/chemical effects on contaminants: they 1) reduce the surface tension of water (make the water act "fatter") to help physically suspend soil; and 2) chemically bond to soil and water, drawing the two together to dissolve the soil by chelation or other method. Both mechanisms, as well as the environmental fate of certain surfactant compounds, act to degrade natural communities of plants and animals in the lake.

My first hands-on experience with soap-killed aquatic life was when I used a mild Castile soap in the Boundary Waters Canoe Area Wilderness. Soon after rinsing (I had only used a very small squirt of soap) I saw numerous light colored dots on the surface of rocks in the water near shore. Closer investigation revealed they were copepods, tiny crustaceans that feed on algae and other material, and are in turn preyed upon by fish and other predators. Later, I had the fortunate opportunity to perform summer work in the EPA Environmental Research Lab in Duluth. I learned that the soap had a high pH and that the wetting tendency of soaps often impairs the life processes of small animals relying on surface tension to assist in physical suspension of plankton. Other organisms actually live on the water's surface film; elevated levels of surfactants can cause such creatures to sink and drown.

In my current position as an environmental consultant, I have come in contact with governmental agencies which regulate the release of surfactants into the environment. The State of Florida, for example, prohibits the use of surfactants in response to petroleum spills.

Certain detergents can contain compounds with impacts beyond the simple pH and DO-depressing effects already described. Certain shampoos, for instance, contain compounds that release formaldehyde, ammonia, or carcinogenic aromatic compounds like benzene as they degrade. These toxic compounds also break down in time, but the intermediate compounds released during biodegradation can have a more toxic effect on certain aquatic life than the parent material. In addition to the product's effects on life in the lake, some surfactants act in synergy with other compounds present to magnify the toxic effect. Certain chelation soaps are very effective in re-suspending or dissolving precipitated heavy metals, increasing their toxic effect...hence the Florida ban on using detergents to clean up petroleum spills.

I would not claim that soap is an evil thing. Properly managed, surfactants make it possible for us to enjoy a high quality of life. Such detergents are a valuable resource. Pollution is a resource out of place. Let's make sure our detergents go to a treatment facility and are kept out of the lake. Life in lakes is attuned to certain natural conditions. Any addition of foreign matter can therefore be assumed to have some adverse or disruptive effect.

I applaud your raising the issue on "soap in the lake." I hope that others with the ability to discuss the full scope of potential impacts from bathing in the lake come forward to educate us in this matter.

Steve Carlson is an environmental scientist for a midwest consulting firm that serves the Minneapolis area.

## One Bath in the Lake... A Comment



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## Reflections

"Thousands of tired, nerve shaken, over-civilized people are beginning to find out that going to the mountains is going home; that wildness is a necessity; and that forests and lakes are useful not only as fountains of timber and irrigating rivers but as fountains of life."

*John Muir, 1898*