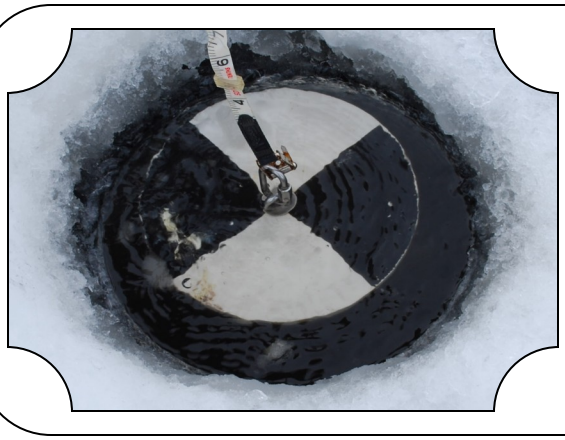


Cattail Chronicles

Issues Affecting the Surface Waters of Lake County

Lake County Health Department and Community Health Center
Irene Pierce, MSN, Executive Director

Volume 21, Issue 1 Winter 2011

Earthworm Invasion!

By: Dr. Lee Frelich, University of Minnesota Center for Forest Ecology

Most of the earthworms you see on the sidewalk on rainy days and that occupy soils in yards and woodlands across the northern Illinois landscape are European species. There are a few native species in northern Illinois and southern Wisconsin (in the genera *Diplocardia* and *Sparganophilus*), but the natives are near the northern edge of their range, not very abundant, and in any case are likely to lose out in competition to European earthworms. Earthworms are ecosystem engineers, and everything changes when they invade (even when they invade area with native earthworms). The soil structure, nutrient and hydrological cycles, plant community, wildlife habitat, and aquatic systems all change.

Earthworms came to North America in large numbers along with settlers and their potted plants from Europe. They have been present in cities since settlement, but are now spreading across the entire landscape due to use as live fishing bait, in potted nursery stock, and their eggs can be spread by muddy tires such as on ATVs. There are many species of exotic earthworms that fall into four main groups by ecological function. First, epigeic species (genera *Dendrobaena*, *Dendrodrilus*, *Eisenia*, *Eiseniella*) that are small and live in leaf litter on the soil surface. These species are thought to cause relatively little ecosystem change. The second group (genera *Aporrectodea*, *Octolasion*, *Allobophora*), are endogeic species, also known as angle worms, with unpigmented skin, that live within the top 10-15 inches of the soil. These species are larger, are common in lawns, forests, and farm fields, and rarely appear above ground except for a few very cloudy, rainy days per year. They move continuously through the soil, making new burrows throughout their lives. The third group is epi-endogeic, and consists of the single species *Lumbricu rubellus*, the leaf worm, a close relative of the nightcrawler mentioned below. This species is a detritivore, meaning that it consumes dead leaf litter, and it is responsible for stripping the multi-year accumulation of leaf litter known as the duff or forest floor. Finally, the species most people are familiar with, the anecic species *Lumbricus terrestris*, commonly know as the nightcrawler, drills deep vertical burrows (up to 6 feet) that are used throughout their lives. Nightcrawlers consume relatively fresh leaf litter, mostly lawn clippings or in forested areas, the leaves that fall to the ground each autumn; they usually enter the forest after *L. rubellus* has already eaten the older leaf litter, and by consuming each year's new litterfall, indefinitely prevent a new forest floor from forming.

Continued on page 3

Inside this issue:

Spotlighting Plants: Garlic Mustard (*Alliaria Petiolata*) 2

Earthworm Invasion! (continued) 3

Spotlighting watershed organizations: Bull Creek/bulls brook 4

Continued spotlighting watershed organizations: 5

Lake Issues: Northeast Illinois Invasive Plant Partnership (NIIPP) 6

Lake Issues: New Permit requirements for applying pesticides 7

Can you name this lake? 8

For information contact:

Population Health

Environmental Services

847- 377- 8030

http://www.lakecountyil.gov/Health/want/BeachLakeInfo.htm

LakeCounty
Health Department and
Community Health Center

Cattail Chronicles

Spotlighting Plants: Garlic Mustard *(Alliaria Petiolata)*

Identification:

Garlic Mustard is a biennial: it has a two-year life cycle.

First Year

Clusters of 3-8 rounded to kidney-shaped leaves develop at ground level during the first growing season.

Second Year

FLOWERS: Small, white, four petals, blooms April-June

LEAVES: Heart shaped to triangular, 1-3 inches wide coarsely toothed, alternate on stem, gives a garlic odor when crushed

HEIGHT: Flowering stalks grow 1 to 4 feet tall

ROOTS: Taproot is slender, white, and often has an S-shaped bend near the top

Garlic Mustard is usually hand pulled the end of May and June. Refer to the Lake County Forest Preserve and Illinois Beach State Park websites for opportunities to volunteer!

http://www.lcfpd.org/

http://dnr.state.il.us/lands/Landmgt/PARKS/R2/Ilbeach.htm

Excerpts from an article by Stephanie Yao in USDA-ARS Agricultural Research Magazine Vol. 57(6):8-9 (July 2009) http://www.ars.usda.gov/is/AR/archive/jul09/weevil0709.pdf

Garlic mustard, *Alliaria petiolata,* is considered one of the most problematic invaders of temperate forests in North America. According to legend, it was brought here from Europe in the 1860s as a culinary herb. Since then, garlic mustard has spread to 34 U.S. states and four Canadian provinces.

"Garlic mustard is an invasive plant that gets a lot of attention," says ecologist Adam Davis, who has been studying the weed for years. "It's very noticeable and hard to eradicate because of its seed bank." Garlic mustard seeds can remain viable for more than 10 years. A single plant can produce hundreds of seeds. The insects and fungi that feed on garlic mustard in its native habitat are not present in North America, increasing the weed's seed productivity and allowing it to "out-compete" native plants.

To better understand garlic mustard and find a suitable bio-control, Davis—in collaboration with colleagues at Michigan State University, Cornell University, the University of Illinois, and the Centre for Agricultural Biosciences International (CABI) in Switzerland—created a computer model that simulates the weed's life cycle to help predict the type and severity of damage to make an impact using a bio-control agent.

Combining the feeding information collected by CABI scientists and the demographic information of garlic mustard in North America, Davis used the computerized life-cycle model to assess weevils' ability to inflict damage on the weed and inhibit its growth. One weevil, *Ceutorhynchus scrobicollis,* came out on top.

The tiny *C. scrobicollis* has a life cycle of 1 year and produces one batch of offspring per lifetime. It lays its eggs on garlic mustard's leaf stems in the fall. When the eggs hatch in the spring, the larvae feed on the weed's root crown, the area from which the rosette's leaves grow and where nutrients are stored.

By feeding on the root crown, *C. scrobicollis* stops the flow of nutrients and water from the roots to the rest of the plant. It also damages the area of the plant where new growth takes place. As a result, garlic mustard produces fewer seeds or, in areas with high weevil populations, dies prematurely in early spring.

C. scrobicollis also appears to only eat garlic mustard. That means scientists won't have to worry about any unintended consequences when using this insect as a bio-control.

C. scrobicollis is currently in quarantine at the University of Minnesota. If all goes well, this beneficial weevil may soon be roaming North America to find a nice garlic mustard meal.

Ceutorhynchus scrobicollis

feeds on the plant's root, root crown, and shoot base, reducing rosette survival and seed production.

Kelly's Corner Kitchen

Garlic Mustard: Pesto

4 cloves of garlic
1 cup garlic mustard leaves
2 cups pine or walnuts
salt and pepper to taste
3 T garlic mustard taproots
1 cup basil
1/2 cup parmesan
3/4 cup parsley
1 cup artichoke
1-1/4 cup of olive or walnut oil

1. **Chop the garlic and garlic mustard taproots in a food processor.**
2. **Add the parsley, basil, artichoke, and garlic mustard leaves and chop.**
3. **Add the nuts and parmesan and chop coarsely.**
4. **Add the oil and process until you've created a coarse paste**

Lake Issues: *Earthworm Invasion*

Continued from page 1

Almost all of Illinois is colonized by European earthworms, although earthworm-free forests can still be found in northern Wisconsin, Minnesota and Michigan. Without the insulation and water holding capacity of the forest floor, forest soils become warmer and drier during summer, thus exacerbating the impacts of droughts. In forests, earthworms also compact the soil, causing less infiltration of water into the soil, more runoff of water and more erosion during heavy rainfall events. Prior to European earthworm invasion, the forest floor protected the soils from direct impacts by raindrops, with the matted layers of leaves that were held together serving as a sponge that soaked up water, allowing it to gradually infiltrate the mineral soil below. Some studies show that phosphorus is leached from forest soils when earthworms invade.

Earthworms reinforce the negative impacts of deer grazing, creating a double whammy for native plants and tree regeneration. Plants such as Trillium, Sweet Cicely, Spikenard, and Bellwort are negatively impacted and reproduction of tree species such as Sugar Maple is greatly reduced due to the drier, more nutrient poor soil, and because the worms work against symbiotic fungi that help trees grow. A few native species, such as Pennsylvania Sedge and Jack-In-The-Pulpit, are well adapted to the presence of European earthworms, and increase in abundance after invasion; sometimes the sedges form extensive lawns in earthworm infested forests, especially in areas with a lot of deer grazing. European earthworms also facilitate most invasive plant species, such as European Buckthorn, Garlic Mustard, Tatarian Honeysuckle, Japanese Barberry and others. These invasive plant species germinate and survive much better on bare soils of earthworm invaded areas than intact forest floors of pristine forests. When earthworms invade, the structure, nutrient and moisture status of the soil changes, which changes the plant community, which in turn changes wildlife habitat. For example ground nesting birds like the Ovenbird don't do as well after earthworms invade.

The final major ecosystem impact is the one we know least about, because research is just beginning—namely impacts on the hydrological system from translocation of phosphorus from the uplands, soil erosion, and larger peak flow events that occur when earthworms invade. This leads to increases in eutrophication and greater changes in water levels when storms occur.

The study of invasive earthworms is one the youngest and most rapidly changing environmental sciences. Research started only in the 1990s. There is still a lot to learn about all of the impacts, and about the Asian earthworms (*Amynthas* species) that are now starting to invade, as well as the Asian flatworm recently found in Wisconsin, which is an earthworm predator. Earthworms are, as Darwin stated in his book on the topic in 1881, among the most important influences on the history of the world. Global worming, or the spread of invasive earthworms to many places around the globe, is sure to be a topic that will receive much attention in the coming years.

An earthworm free forest in northern Wisconsin.

A nearby area infested with Lumbricus terrestris

Photos by Paul Ojanen.

Go Green
Go Paperless

Sign up to receive an electronic version of Cattail Chronicles:

Send us an e-mail requesting the environmentally friendly version of Cattail Chronicles

PRatiff@lakecountyil.gov or give us a call (847) 377-8030.

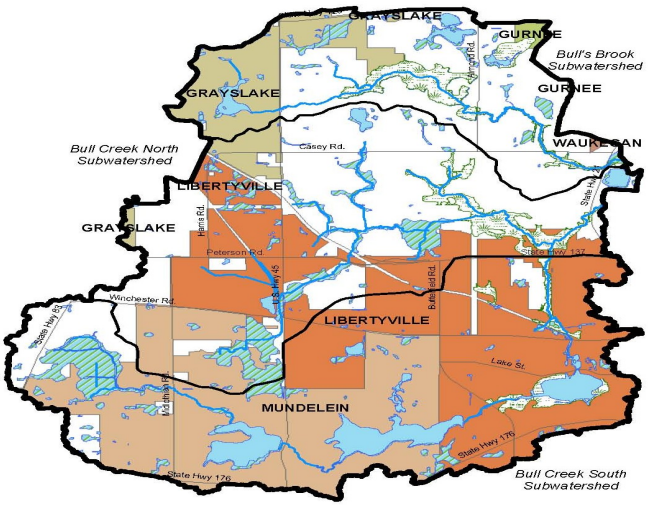
The RiverWatch Program has sponsored the creation of a new guide: Macro invertebrates of Illinois. The guide includes color photographic plates and is a new resource for those interested in identifying the worms, bugs, leaches, and shrimp-like creatures that inhabit Illinois streams.

www.ngrrec.org/riverwatch/

Spotlighting Watershed Groups: *Bull Creek/Bull's Brook Watershed*

By: Nancy Schumm-Burgess, Coordinator

Tucked in the midst of the Upper Des Plaines River Watershed is the Bull Creek/Bull's Brook Watershed, a subwatershed of the larger river basin. The Bull Creek/Bull's Brook Watershed possesses a contrast of land uses from rural farms to nature preserves to suburban communities like Grayslake, Libertyville and Mundelein.



Bull Creek/Bull's Brook Watershed provided by (SMC)

The natural gems of this watershed include privately and publicly protected nature preserves like Liberty Prairie Preserve boasting a remnant native prairie that supports threatened species, and Almond Marsh, home to threatened and endangered species and a large heron rookery. Other natural resources include Saint Mary's of the Lake, Loch Lomond, Butler, and Leopold Lakes as well as numerous wetlands, savannas and woodlands.

Humans have taken up plenty of space here as well, as nearly 43% of the watershed is developed with villages, subdivisions, commercial/industrial complexes, schools (including University of Saint Mary of the Lake), and recreation facilities like golf courses, soccer fields and playgrounds.

The Bull Creek/Bull's Brook Watershed Plan was completed in 2009 after dedicated years of input from area stakeholders, technical advisors, and with financial assistance and guidance from the United States and Illinois Environmental Protection Agencies along with the Lake County Stormwater Management Commission (SMC). The plan represents the best recommended practices for protecting, improving and enhancing the watershed in order to improve water quality, reduce flood damage, and guide new development to benefit the watershed.

Goals that emerged in the plan are to:

- Protect and restore natural resources
- Improve water quality
- Reduce flood damage
- Enhance and restore stream health
- Guide new development to benefit watershed goals
- Preserve green infrastructure
- Enhance education and stewardship

Improve watershed coordination and collaboration.

In the spring of 2010, a coordinator was hired to assist in implementation with a Watershed Management Assistance grant from SMC. After the launch of the plan in June of 2010, a council of leadership was formed and the plan is being introduced to area stakeholders to encourage local adoption of the plan, and then to assist those same stakeholders in the implementation of recommended action items in the plan. As of January, the following groups have formally adopted the plan: Liberty Prairie Conservancy, Liberty Prairie Area Homeowners Association, Libertyville Township, Mundelein Park District and the Lake County Board.

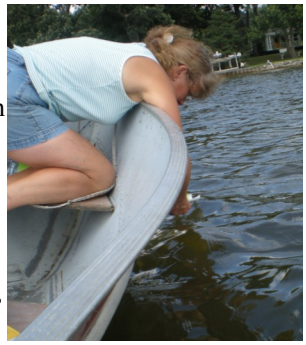
Continued on page 5

Join Summer VLMP

Dick Schick 30 year VLMP
Lake Zurich

Lakes are important resources that will continue to provide beneficial uses only if certain protective and educational steps are taken. In recognition of this need, the *Volunteer Lake Monitoring Program (VLMP)* was established in 1981 by the Illinois Environmental Protection Agency (IEPA). In the Basic Monitoring Program, citizens select a lake in which they have an interest and are then trained to measure water clarity (transparency) using a Secchi disk. This increases citizen knowledge and awareness of the factors that affect lake quality so they can understand the lake/watershed/ecosystem and make informed decisions. Volunteers monitor twice a month May through October, in 2010 there were **43 lakes** in Lake county participating. If you would like more information please contact:

Kelly Deem
(847) 377-8009 kdeem@lakecountyil.gov
www.epa.state.il.us/water/vlmp/index.html



Melonnie Hartl
1st. year VLMP
Spring and Bluff Lake

Spotlighting Watershed Groups*: Why watershed groups are important*

Bull Creek/Bull's Brook Watershed Planning Committee

The Watershed Council leadership team made up of Sarah Surroz (Liberty Prairie Conservancy) as chair, Kathleen O'Connor (Libertyville Township) as vice-chair, and Mary Ann Bliss (Motorola) as secretary began an education strategy with several workshops. The Watershed Council hosted a grant seminar featuring Scott Tomkins of the Illinois Environmental Protection Agency in October of 2010. In December 2010, the Council hosted a seminar on introducing green infrastructure into established communities featuring Dennis Dreher of Cowhey, Gudmundson, Leder, a leader in green planning efforts in the Chicago Area.

The great news for the watershed is that several projects have already been undertaken by stakeholders including:

- Mundelein Park District is presently working on restoring a section of Bull Creek South that flows through Community Park by the Barefoot Bay Aquatic Center.
- As part of Motorola's Global Day of Service, volunteers from Motorola helped the Liberty Prairie Conservancy and Libertyville Township clear invasive shrubs at Casey Farm just north of Libertyville. Over time, the Conservancy and the Township plan to restore the natural areas of Casey Farm and use the site to demonstrate sound stewardship practices.
- The Liberty Prairie Area Homeowners Association completed stream corridor restoration along a tributary to Bull Creek North as a demonstration project for other homeowners in their neighborhood.
- The Prairie Crossing Homeowners Association stabilized a section of eroding shoreline at Lake Leopold.
- Loch Lomond Property Owners Association hosted a lake and watershed education fair in association with Loch Fest.
- Liberty Prairie Conservancy hosted several educational events for homeowners including a workshop on using best practices for a healthy yard.

In 2011, the Watershed Council will continue to meet with stakeholders and host programs designed to assist communities in implementing action items from the plan, finding the appropriate funding to complete their goals, and providing assistance to homeowners with watershed education. The first program, on Wednesday, February 23, will help municipal, homeowner, and community groups prioritize watershed action steps they can each accomplish in the near future. On Wednesday March 16, the watershed will host a grant-writing seminar. This program is designed for the novice interested in finding grant funding for area projects. For more information on upcoming projects and information from past programs, visit the Bull Creek/Bull's Brook Watershed page at the Lake County Stormwater Management Commission web site at http://www.lakecountyil.gov/Stormwater/LakeCountyWatersheds/BullCreekDP.htm.

Watershed protection is most successful when everyone participates. Rivers have been described as the arteries of the landscape, carrying important lifeblood through the land to and from lakes and oceans. Then it should follow that streams and creeks are the capillaries that support the entire system. The importance of them cannot be minimized. The health of our lakes and rivers is a reflection of the health of the land of the watershed. Healthy water improves the quality of life all the residents, human or animal, who dwell in each watershed.

Join Winter VLMP

Gina Kraenzle
1st year winter sampling
Channel Lake and Lake Catherine

Winter is here, and our lakes have taken on a completely different appearance. In Lake County we have many volunteers that collect lots of valuable water quality data from May to October however, we have little or no ice data on our lakes. So we asked our summer Volunteer Lake Monitors if they would be interested in continuing to monitor their lakes during the more challenging months by participating in a trial winter sampling focusing on lake ice thickness. There are currently eight lakes participating including: Loch Lomond, Channel Lake, Catherine Lake, Lake Marie, Fisher Lake, Diamond Lake, Cedar Lake, and Cross Lake.

Greg Denny
9 year VLMP (Tier 3)
Diamond Lake

Lake Issues: **Northeast Illinois Invasive Plant Partnership (NIIPP)**

Through the Great Lakes Restoration Initiative, the US Forest Service provided local and state land management organizations with $96,000 in funding to establish a Cooperative Weed Management Area called the Northeast Illinois Invasive Plant Partnership (www.NIIPP.net). The Lake County Health Department and over 40 other regional partners, many of which are a part of the Chicago Wilderness Alliance, are working together to help reduce the threat of invasive plants in northeast Illinois.

The mission of NIIPP is to preserve native plant biodiversity and plant habitats in 18 counties of northeastern Illinois through the prevention and control of non-native plants. Non-native plants can, in essence, take over woodlands, prairies, lakes, and wetlands, threatening the survival of native plants and wildlife. NIPP partners will address that threat by working with volunteers and professional land managers to control the invasion and spread of non-native plant species.

In August 2010, Cathy McGlynn was named the coordinator for the partnership. McGlynn, who is based at the Chicago Botanic Garden and employed by the Chicago Wilderness Trust, has since worked with 15 partner agencies to seek funding to treat eight new invasive plant species, including Black Swallow-wort and Japanese knotweed, across more than 80 acres. They are also hoping to fund **New Invaders Watch Program** (www.NewInvaders.org)**,** an early detection and rapid response program developed to help land managers and volunteers identify and control invasive plant species that are new to the Chicago region.

"The launch of the new regional cooperative weed management area has met with widespread enthusiasm," said Cathy McGlynn. "Partners are expressing a number of needs that a regional partnership like NIIPP could assist with, such as increasing public awareness of invasive plants, leveraging the funds of many local partners to increase competitiveness for federal and private grant opportunities, and coordinating on-the-ground control efforts."

"The Northeast Illinois Invasive Plant Partnership will facilitate the sharing of information and resources across organizational and geographic boundaries, building the capacity of all the partners to mobilize against the threat of new invasive species and promote the health of our local ecosystems," said Debbie Maurer, NIIPP Steering Committee Chair, Lake County Forest Preserve District.

Regional partners actively involved with NIIPP include US Forest Service, Illinois Department of Natural Resources, Forest Preserve Districts, Conservation Districts, Park Districts, Municipalities, Universities, Chicago Botanic Garden, Morton Arboretum, Land Trusts, State and County Departments of Transportation, Private Business, Not-for Profit Organizations and Volunteers.

STOP AQUATIC HITCHHIKERS!™

Consider becoming a
Stop Aquatic Hitchhiker
Campaign partner.

You can learn more about the campaign and how to become a partner by contacting Pat Charlebois, Aquatic Invasives Specialist for the Illinois-Indiana Sea Grant at charlebo@illinois.edu. As a partner, you don't HAVE to do anything and the COST to your organization is FREE. Being a partner allows you to have access to graphics that you can use on your website, etc., to promote the Campaign.

Illinois Lake Management Association

Illinois Lake Management Association and Illinois Chapter American Fisheries Society

are jointly hosting their annual meetings at the Hotel Pere Marquette, 501 Main Street, Peoria, IL 61602

Wednesday, March 2, 2011 through Friday, March 4, 2011

Illinois AFS
Illinois Chapter of the American Fisheries Society

- Conference officially begins at 1pm on Wednesday, March 2 and concludes at noon on Friday, March 4.
- Registration fee includes refreshments during breaks, exhibitor social Wednesday evening, and lunch and dinner banquet on Thursday. The Pere Marquette provides a free hot breakfast to those staying in the hotel.
- A block of rooms is reserved until February 9 under "IL Lake Management Association"; room rate is $70 per night plus tax single and $85.per night plus tax double. We encourage you to reserve your room early. Reservations can be made by calling the Reservations hotline: (800) 447-1676.
- Two post -conference workshops will be offered on Friday from 1- 5 pm. For more information visit the ILMA webpage.

http://ilma-lakes.org/conference.html

Lake Issues: **New Permit Requirements for Applying Pesticides in Waters Starts April 2011.**

By: Mike Adam

Starting this April, new regulations go into effect that will significantly affect how pesticides are used in Illinois waters. A National Pollutant Discharge Elimination System (NPDES) permit will now be required to apply any type of pesticides over or into waters of the State. On January 9, 2009, the Sixth Circuit vacated USEPA's 2006 NPDES Pesticides Rule under a plain language reading of the federal Clean Water Act. The Court held that the CWA unambiguously includes "biological pesticides" and "chemical pesticides" with residuals within its definition of "pollutant." USEPA estimates that the Sixth Circuit's ruling will affect approximately 365,000 pesticide applicators nationwide that perform 5.6 million pesticide applications annually. In Illinois, the permitting process will be administrated through the Illinois Environmental Protection Agency (IEPA).

Who has to get a permit? According to the language in the permit, anyone who qualifies as an "operator", which is defined as: "any person, persons, group, or entity in control over the financing for, or over the decision to perform pest control activities, or applying pesticides that will result in a discharge to waters of the State". Clarification of this definition is currently being investigated, since the plain language interpretation may mean homeowner associations or even individuals may need to get a permit. However, it is believed that it will be primarily aimed at commercial applicators. Regardless of the size of treatment, a permit will be needed. If the treatment area or total annual area exceeds certain thresholds then additional requirements will be required such as a Pesticide Discharge Management Plan and an annual report. The thresholds vary depending on type of treatment. For weed and algae control, the threshold is 20 acres of treatment or 20 linear miles along the water's edge. The threshold is an annual total, so for example, algaecides applied to five acres four times during the year, would meet this 20 acre threshold requirement. The new rules will also affect other pesticide applications such as mosquito control, aquatic nuisance animal control, and forested area pest control (over or near water). Outside the scope of this permit are terrestrial applications to control pests on agricultural crops or forest floors.

Anyone or any group planning to treat their pond or lake with pesticide this year should take into account these new requirements. More information will likely be available soon from the IEPA. For full details of the rule see: http://www.epa.state.il.us/water/permits/pesticide/index.html

Illinois Lake Management Association

WORKSHOPS

Illinois Lake Management Association and Illinois Chapter American Fisheries Society

Friday, March 4, 2011 1- 5p.m.

Illinois AFS — Illinois Chapter of the American Fisheries Society

Illinois RiverWatch Network:

Citizen Scientist Certification Workshop

Join RiverWatch and become a part of a large network of volunteers who steward and protect Illinois streams. RiverWatch certified volunteers, referred to as Citizen Scientists, collect reliable water quality data that are used to track changes in stream conditions over time. In this session, you will receive the information and resources to monitor a stream site. The workshop will include only the classroom component. You will learn how to identify macroinvertebrates that live in our streams and serve as indicators of water quality. A field component (not part of this workshop) will be required for full certification. Visit www.ngrrec.org/riverwatch for additional program information.

Global Positioning System (GPS) and Digital Mapping Workshop

Learn the theory and basics of digital data capture, GPS technology and online digital mapping. Review practical application for various natural resources and lake management projects and share maps with your friends and others. This workshop will focus on freeware GIS mapping platforms. Those with laptops are invited to follow along.

Can You Name This Lake?

Clues:

Part of the Chain O' Lakes

Participating in 2011 Winter Sampling

Glacial Lake

Max Depth 36 ft
Average Depth 14.5 ft

Surface Area: 370 acres

Connected lakes:
Catherine Lake
Lake Marie (by a channel)

Official headquarters for the Ice Fishing Derby held on Feb 12 & 13 2011. Hosted by the NICC– Northern Illinois Conservation Club

Help protect your lake from invasion!

Aquatic invasive species (AIS) can cause serious problems for our inland lakes. AIS, which include things like zebra mussels and Eurasian watermilfoil, are often spread among lakes via recreational water users via boats and boating and fishing equipment.

To help lake associations protect their lakes from being invaded by AIS, The Northern Illinois Invasive Plant Partnership (NIIPP) and Illinois-Indiana Sea Grant (IISG) are seeking volunteers to help with a new program called "Clean Boats - Clean Waters" designed to create awareness among recreational water users about AIS and how to prevent their spread. Volunteers will receive training at a 1-day workshop, and then pass along their new knowledge at boat ramps during the boating season. For more information or to volunteer contact NIIPP at cathy.mcglynn@niipp.net.

Inside:
Illinois Lakes Management Association teams up with Illinois American Fisheries Society for this years conference!!

LakeCounty
Health Department and
Community Health Center

Environmental Health Services
500 W. Winchester Road, #102
Libertyville, IL 60048

PRSRT STD
STANDARD MAIL
U. S. POSTAGE
PAID
PALATINE, IL
PERMIT NO. 183