POSTER DESCRIPTIONS & PRESENTER INFORMATION

32ND ANNUAL WISCONSIN LAKES CONVENTION
WEDNESDAY, MARCH 31, 2010
12:30-1:30PM IN KI CONVENTION CENTER EXHIBIT HALL

Accelerated Hand Pulling Technique for EWM Removal

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The Tomahawk Lake Association of Oneida County operates a mechanical plant harvesting system called the Hydraulic Conveyor System (HCS). The HCS harvests Eurasian water-milfoil from the lake bed and is a diver operated system. It is completely selective in that the diver hand harvests the plants and feeds them into a suction tube for removal to a work barge on the surface. Bottom disturbance is virtually nonexistent and the entire plant, including root ball, is removed. It is totally non-chemical and is targeted at sites of new infestation, areas where chemical applications are not possible, and in areas where chemical treatment has proven ineffective. It greatly speeds up the hand harvesting, as the diver stays down for an extended period of time, and the need to surface to bag the plant material is eliminated.

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Blue Heron Shoreland Stewardship Award Program

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The Vilas County Lakes Association (VCLA) modified the DNR's Shoreland Stewardship Award criteria to recognize the shoreland preservation, maintenance and restoration efforts of Vilas County riparians. The purpose of the BLUE HERON Shoreline Stewardship Award program provides means to recognize efforts of lake property owners, raise countywide awareness, and provide lake associations and lake districts with direction. The poster will discuss award criteria, nomination guidelines/timelines, notes for property reviewers, and samples of awards.

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Citizen Lake Monitoring Network – Through the Years

Laura Herman, UW-Extension Lakes
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Do you remember the good old days of the Mason jar samplers? Were you involved in the equipment "demonstration" studies? Remember the joys of sending in your data on post cards? Come reminisce about the Citizen Lake Monitoring Network. Learn a bit about how the Network got started, what changes have taken place over the years and what we are planning to do over the next few years. So much has changed, and it is time to look back and enjoy our roots!

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Contrasting Effects of Urban and Agricultural Land-use on Zooplankton Community Structure in an Urbanizing Region

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We hypothesized that zooplankton community structure would correlate more strongly with watershed land-use than primary productivity or lake morphometry. In addition, we hypothesized that land-use change over a 33 year period would alter zooplankton community structure differently depending on the predominant type of watershed land-use. Quarterly zooplankton samples were collected from 29 Southeast Wisconsin lakes both in 1974 and 2007 to determine how land-use, water quality and lake and watershed morphometry affected both among and within lake zooplankton community structure.

Multivariate analyses were used to characterize dominant gradients in environmental factors and pelagic zooplankton communities among lakes. Within lake species, composition and body size did not differ significantly between the two years. Species richness within lakes was higher in 2007 than 1974 along with greater Secchi depth and pH. Across lakes, the major environmental correlates of community structure were urban land-use (affecting cladoceran species composition) and primary productivity (affecting copepod species composition and species richness). An increase in watershed agricultural land-use and disturbed buffer zone land-use was significantly correlated with higher primary productivity. This study illustrates that land-use indirectly impacts biological communities among and within lakes, but that urban and agricultural land-uses each affect different aspects of water quality and zooplankton community structure.

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Diet Changes in Pumpkinseed Sunfish in Response to Increased Picsivory

Anthony Matthys & Dr. Jim Hodgson, St. Norbert College
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Dietary response of age 1 pumpkinseed sunfish, *Lepomis gibbosus*, to increased largemouth bass, *Micropterus salmoides*, piscivory was monitored. Bass were added twice to Peter Lake during the summer of 2009. Mean percent mass of zooplankton was 52% (σ=26) before the first bass addition, then dropped to 5% (σ=8) afterwards. Following the second addition the mean percent mass recovered slightly to 16% (σ=14). Before the first bass addition, the percentage of zooplankton by count was 84% (σ= 17), but after the first addition the mean percentage decreased to 45% (σ=19); then recovered to 70% (σ= 15) after the second addition. Also, prey composition changed (% count) where pelagic zooplankton, *Bosmina* and copepods, decreased from >95% to <31%, and chydorids (a littoral cladoceran) increased from 0.02% before the first bass addition to >43% after the second LMB addition. These data suggest a piscivore induced risk behavior change in pumpkinseed sunfish as they shift from the pelagic zone to the littoral zone. The diet Population Similarity Index remained relatively constant ranging from 0.67 to 0.73 indicating no individual foraging specialization.

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Evaluation of Littoral Plant Community Re-establishment in Four Northern Indiana Glaciated Lakes

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Loss in both the density and diversity of native aquatic plants in the littoral environment of northern Midwest glaciated lakes has become an issue of growing concern. This decline in native plant density and diversity can most often be attributed to increased use or misuse of aquatic herbicides, introduction of exotic species, the loss of native shoreline to seawalls, and increased personal watercraft and boat traffic. The loss or reduced quality of a lake's littoral zone can directly impact a lake's overall water quality, biotic community and the overall enjoyment of the lake by the public. A research project conducted from 2007 to 2009 at four different lakes in the northern glaciated lakes region of Indiana focused on restoring or improving littoral plant communities. Goals for the project were to develop and evaluate methods to successfully establish plants within open water (littoral) environments and to re-establish vegetation on former vegetated areas within each of the four lakes. Data suggest that a structurally sound medium for planting results in better survival of planted individuals in two to three feet of water. The data also suggests that just providing an exclosure structure around the planting area encourages volunteer species survival. Outside control areas remained constant from year to year while survival of volunteer and a few planted species within the exclosure continued to increase or remained constant. In general, only one of the planted species utilized (eel grass) might be considered successfully established at three of four sites.

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Fish Passage in the Manitowish River Headwaters

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In the summer of 2009, an inventory of all of stream crossings upstream of Rest Lake Dam was completed. Information was collected on stream and crossing characteristics, with a goal of analyzing fish passage, habitat connectivity, and erosion. Crossings were ranked to prioritize repair and replacement. This project is being used to test the development of a WAV module to allow volunteers to collect this information.

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The Human Effect on Fish Habitat and Populations Within the Milwaukee River Estuary

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Fish and other aquatic organisms need a variety of habitats to complete their life cycles. These species move throughout streams and watersheds to find suitable conditions to spawn, raise their young, or survive the winter. Unfortunately, barriers such as dams, culverts, and debris jams, many times a consequence of indirect human actions, can prevent animals from accessing critical habitats. Recent natural resources management trends support removing artificial barriers to create streams that are passable for fish and other animals. This strategy, in effect, revitalizes fisheries and improves recreational opportunities. It is usually much less expensive and more productive than creating artificial habitat. Bonestroo (then Northern Environmental) in 2006 identified and evaluated potential barriers on 11 warm-water streams for Ozaukee County. Bonestroo ultimately identified over 100 stream barriers, and our report was then used to prioritize these barriers for removal. To take advantage of the high-quality habitat that exists in Ozaukee County, several organizations have teamed up to modify or remove these barriers. Ozaukee County, area municipalities, Bonestroo, and the WDNR are all working together to restore habitat access routes for fish and aquatic organisms. This project will not only improve the recreational resources available in Southeastern Wisconsin, but will also improve the quality of life for the aquatic organisms. On June 30, 2009, the County was awarded a $4.7M grant that is part of the American Recovery and Reinvestment Act. Ozaukee County was the only Wisconsin applicant to receive funding and was one of 50 recipients selected from the 814 proposals received for the grant.

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Incorporating Shoreline Development in a Lake Impact Model

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The need to estimate how shoreline development impacts lake water quality has led to a variety of simulation models. These development impact models are currently used to regulate land management around lakes in several states and provinces. Most of these models predict in-lake phosphorus concentrations using a mass-balance approach. Phosphorus inputs are characterized and used with hydrologic assumptions to estimate phosphorus concentrations. Phosphorus concentration is a very useful measure of water quality because it is strongly linked to other impacts, such as increased algal density. One of the challenges to development impact modeling lies in simulating the many site-specific factors that likely influence phosphorus transfer. Unfortunately, most models currently use generalized unit-area nutrient loads for developed areas. It is increasingly important that we account for site-specific factors as more regulations move from dimensional to performance standards and specifically target numerical phosphorus water quality goals. This shift makes it increasingly necessary to develop new models to estimate the impact of specific development practices or mitigation strategies.

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Moose Lake Legacy Initiative: Citizen Contributions to Land Conservation

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The Moose Lake Legacy Initiative has engaged an exceptional partnership between citizens and resource professionals to inventory and analyze landscapes within the West Fork of the Chippewa River Watershed. Particular attention was focused on the islands and shorelines of Moose Lake, in Sawyer County, Wisconsin. Throughout this initiative, citizen volunteers have invested generously with their time and energy. With help from professionals, they learned how to inventory coarse woody structure, aquatic macrophytes, aquatic invasive species, shoreline development, natural scenic beauty, ecological reference areas, and wildlife. Equipped with new skills, they inventoried 50 miles of shoreline looking for these ecological and aesthetic characteristics, features, and indicators. The locations and attributes of the citizen inventories are preserved in a Geographic Information System enabled Watershed and Lake Information System (WALIS). WALIS was used by the Couderay Waters Regional Land Trust to prioritize land conservation choices. Additionally, WALIS is accessible by professionals and citizens to monitor changes to the lake over time, contribute to professional lake studies, or inform lake management decisions. Using freely downloadable tools, such as Google Earth, Arc Explorer, or Arc Server, anyone with an internet connection can access the lake and watershed datasets.

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NEW to WISCONSIN - Be on the Look-out for these Aquatic Invasive Species

Laura Herman, UW-Extension Lakes
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Come learn a bit more about a few of the new aquatic invasive species we dealt with in 2009! See photos and vouchers of yellow-floating heart, Brazilian waterweed, and the red swamp crayfish. Learn about the identification of these organisms and why these may be a threat to Wisconsin's lakes and rivers. We'll discuss control efforts that have taken place and what will happen in 2010 and the coming years.

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Overwintering Habitat Preferences of the Milfoil Weevil, *Euhrychiopsis lecontei*, on McDill Pond in Portage County, WI

Amy Thorstenson, UW-Stevens Point Graduate Program; Dr. Ronald Crunkilton, UW-Stevens Point; &
Dr. Michael Bozek, Wisconsin Cooperative Fishery Research Unit, UW-Stevens Point
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The native milfoil weevil, *Euhrychiopsis lecontei*, shows potential to be effective biological control of the nusciance aquatic macrophyte Eurasian water-milfoil, *Myriophyllum spicatum* L., in small plot trials, but field application has shown mixed results. To better define habitat requirements for winter hibernation survival, multivariate (discriminate analysis) and univariate methods were used to identify the habitat variables that best define weevil hibernation habitat at 52 shoreline sample sites on McDill Pond, an impoundment of the Plover River, in Portage County, Wisconsin. Although discriminate analysis was not statistically significant due to low sample size, it suggests that weevils occured in shoreline habitat that was higher above the water level and had lower soil organic matter, lower soil moisture, higher duff depth, and higher percent of woody debris than habitats where weevils did not occur. These results may be useful for comparison to data from a larger sample size from additional lakes.

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Phosphorus Sorption by Hydric Soil in a Wetland after Dairy Manure Loading

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Wisconsin has 13,000 licensed dairy herds and 1.2 million dairy cows producing high quantities of phosphorus (P) in their manure. For the 26 million tons of solid manure generated annually in Wisconsin, this results in 78 million pounds of P_2O_5. Recommended manure spreading guidelines were recently changed to a P standard, resulting in 75% of Wisconsin farms having insufficient tillable land for manure spreading. Phosphorus exists in a reversible association with soil. Dissolved P in subsurface losses represent a major percentage of the total P delivered from an agricultural site. However, P delivery in subsurface flow is not as well understood as P delivered in surface runoff. To better understand the impacts of excessive subsurface P loading in fresh water inland wetlands, P sorption and P sorption capacity in Wisconsin wetlands must be evaluated in relation to distance from the loading source. It would also be useful to examine if long term loading has increased the amount of P leaving wetlands. The purpose of this study is to understand how wetlands influence P movement.

Planning for the Future of Portage County Lakes: A Residential Build-out Assessment

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Like many lakes around Wisconsin, some of the Portage County lakes are experiencing loss of habitat due to development and land use practices, reduced water quality, and the spread of invasive species. As part of a lake management planning process, the Center for Land Use Education (CLUE) conducted a detailed build-out analysis for many of the lakes' ground and surface watersheds, looking at the potential for residential development. Using advancements in mapping technology, CLUE used Geographic Information Systems (GIS) and Community Viz™ to determine the amount and location of residential buildings associated with existing zoning and subdivision regulations. Results of the analysis showed that build-out under current zoning would allow for 9,371 new dwelling units, nearly doubling the present number within all the watersheds. The real surprise when viewing the generated maps was the amount of development that could occur in some of the watersheds, a finding of great concern when viewed in relation to goals of the lake management plans of maintaining habitat and improving water quality. The build-out maps are being used to simulate potential land use change and subsequent phosphorous loading to each lake in the study. The results of this GIS-based analysis provide local citizens and officials an incentive for implementing policies that minimize the effects of future development on Portage County's lakes.

Practical, Large-scale Rearing Methods for Milfoil Weevils: Results of Refined Methods

Amy Thorstenson, UW-Stevens Point Graduate Program & Dr. Ronald Crunkilton, UW-Stevens Point
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Eurasian water-milfoil (*Myriophyllum spicatum*) is a non-native aquatic plant from the Eurasian continent that has been gaining notoriety across the United States for its aggressively invasive nature. Historically, control options have relied primarily on chemical treatments, but this has not provided a long-term solution. Declines in *M. spicatum* have been associated with several herbivorous invertebrates, including the native milfoil weevil (*Euhrychiopsis lecontei*) that feeds exclusively on milfoil species. Research suggests *E. lecontei* has potential as a biological control agent. However, the expense of purchasing sufficient quantities of weevils may be cost prohibitive to many lake groups. The potential for rearing weevils by lake groups was investigated by rearing weevils in three types of outdoor, predator-free chambers during the months of June–August 2008. The experiment was repeated, with refined methods, in June-August, 2009. Chamber styles included 100-gallon livestock watering tubs, 5-foot diameter wading pools, and 100-gallon livestock watering tubs suspended in a lake. Chambers were not aerated or heated, but conditions were monitored with regular dissolved oxygen readings and continuous-recording thermometers. Expected production was estimated to exceed 11,000 weevils from a starter stock of 1,595. A step by step rearing procedure for practical application was developed.

Surveillance of Health Events Related to Harmful Algal Blooms in Wisconsin

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The Wisconsin Division of Public Health is working with the Centers for Disease Control and Prevention to enhance monitoring of health events related to harmful algal blooms. The information collected by the WI Division of Public Health will be used to better understand the burden of illness associated with harmful algal blooms and to prevent future exposure to harmful algae. Program staff has facilitated the reporting of algae-related illness through partnerships with local public health departments, the Wisconsin Poison Center, veterinarians and outreach to private citizens. In addition to monitoring algae-related health events, this program also includes environmental sampling following a reported health event. Water sample analysis may include cyanobacterial identification and enumeration, cyanotoxin analysis and a suite of surface water quality measures. In the summer and fall of 2009, the Harmful Algal Blooms program identified 35 adverse health events where algae were the probable cause. Reported health complaints varied from gastrointestinal distress to dermal rash and flu-like illness. Human and animal health events were widely distributed across the state and included both direct and indirect exposure to waters experiencing an algal bloom. Effective, enduring collaborations between public health, agriculture and the natural resources sector can promote effective policies to reduce watershed pollution, particularly in shallow, man-made lakes. These polices will be required to reduce the frequency and intensity of harmful algal blooms in Wisconsin.

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Water Clarity Monitoring Through the Use of the Secchi Disc

Laura Herman, UW-Extension Lakes
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Ever wonder why we want staff and volunteers following specific protocols for secchi monitoring? Curious what would happen if you "skipped" certain procedures? If so, please stop by and review the Water Clarity Monitoring through the use of the Secchi Disc poster. We can make our data more accurate by following a few simple steps. Feel free to join in our secchi Quality Assurance / Quality Control study. More information will be handed out by the display.

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Well Maintained Lawns Can Reduce Runoff

Dr. John Stier, UW-Madison & Eileen Nelson, UW-Madison Department of Horticulture
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Runoff is a natural occurrence but it has gotten worse where we have paved or where we have constructed buildings. The volume of runoff and the pollutants in runoff can be controlled with dense vegetation. Lawns can provide runoff reduction and good filtration of pollutants if they are properly maintained.

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Whitefish Lake: The Ecology of a Wisconsin Gem

Eric Olson, UW-Extension Center for Land Use Education
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Whitefish Lake (Douglas County) is an 800+ acre, deep oligotrophic lake nested in northwest Wisconsin. The U.S.G.S, DNR, UW-Stevens Point, UM-Duluth, UW-Extension, and other researchers recently completed a four-year collaborative research and planning project to better understand this lake and set the stage for its long-term protection. The results highlight the lake's innate ecological capacity to assimilate and fix the low volume of nutrients regularly entering the lake from groundwater and precipitation. Researchers found early evidence that the lake's capacity to sequester phosphorus is not unlimited and that actions are needed to ensure that the lake does not lose its unique qualities.

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Winter Drawdown and Shallow-water Management on McDill Pond

Paul Skawinski, Golden Sands RC&D & Krista Olson, McDill Inland Lake P&R District
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McDill Pond is a 261-acre impoundment of the Plover River in Stevens Point, WI, with a maximum depth of 20 feet. A winter drawdown was conducted from October 2008-May 2009 to restore the shoreline vegetation and knock back the abundant Eurasian water-milfoil. Beneficial species like giant bur-reed, smartweeds, and horned pondweed came back to inhabit the areas that were dried out during the drawdown. In addition, residents in the McDill Lake Inland P&R District took part in restoration of native shoreline vegetation buffers, removal of two patches of Japanese knotweed, and hand-pulling of Eurasian water-milfoil (in February!) during the drawdown. Stop by this poster to learn about all of the work that went into this intense management strategy.

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Wisconsin's Freshwater Sponge Citizen Monitoring Program

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Freshwater sponges grow in lakes, rivers, bogs, and streams attached to submerged rocks, sticks, logs, or vegetation. They feed by filtering small particles from the water, and so they are thought to be sensitive indicators of pollution. Wisconsin's sponges were studied extensively in the 1930s and in many lakes and major river systems. Since then, extensive studies have not been done, though some limited research might indicate that the range of some species is more restricted than in the 1930s. This Citizen-based Monitoring effort will try to shed more light on abundance and distribution of Wisconsin's sponges today. Through this project, we are engaging volunteer monitors to document freshwater sponges in Wisconsin.

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The Wisconsin Lakeshore Restoration Project

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For many of us, our lakeshore represents the sweep of one's heart, a place filled with memories of growing up, catching fish, watching frogs and whiling away the sweet summer days. However, during the past few decades especially, the domestication of our shoreland buffers has altered the character of our shores in damaging ways (Bernthal 1997). But do not despair, change is afoot! Over the last three years researchers working with the Wisconsin Lakeshore Restoration Project are trying to get us some answers related to shoreland restoration work. This project seeks to quantify the ecological and water quality benefits associated with buffer renewal by measuring the value of fish and wildlife habitat restoration. It is a collaborative partnership that includes shoreland property owners, lake groups, state and county agencies, local plant nurseries, academia, and other partners. The project compares and contrasts habitat and water quality data between developed and undeveloped lakes that were identified by WDNR researchers for the study. These pairings of lakes share similar lake characteristics like chemistry, size, type, and landscape positioning. Through the project partnership, four developed lakes in the study are getting significant stretches of shoreland buffer restored. Baseline data from these lakes is then compared to untreated controlled sites on the same lake and to reference sites on undeveloped lakes. This project started in 2007 with several shoreland buffer restorations on Found Lake in Vilas County, and it has continued on with sites on Moon and Lost Lakes, also in Vilas County.