

Poster Descriptions & Presenter Information

Friday, April 24, 2015

3:30 – 5:00pm

Holiday Inn Convention Center Commons

TOPIC: Aquatic Invasive Species

AIS Bridge Snapshot Day: The Search for Aquatic Invasive Species

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On Saturday, September 13, 2014 the River Alliance of Wisconsin in partnership with the Wisconsin DNR and 24 other partner organizations, hosted the 2014 AIS Bridge Snapshot Day. 161 volunteers convened at 17 rendezvous sites around the state to embark on a treasure hunt that would take them to one or more rivers in search of invasive species. Volunteers scurried down bridge abutments, waded in the water, and scoured the river bed and banks to see what they could find. Collectively they monitored 142 sites on 59 different waterbodies. They found invasives at 46 of the 142 sites. A total of 72 invasive species were reported. Due to the success of the event, we will be replicating this event on August 29, 2015!

AIS Waterfowl Hunter Awareness

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The Wisconsin Department of Natural Resources and its partners have been actively engaging boaters and anglers on aquatic invasive species (AIS) prevention efforts for more than a decade, but is the AIS prevention message reaching other audiences that frequently use our precious waters and wetlands, such as waterfowl hunters? This question prompted the Wisconsin AIS program and its partners to develop a survey to start looking at waterfowl hunters' understanding of the AIS laws and their potential for spreading AIS. This poster will focus on the results of the AIS Waterfowl Hunter Survey (Fall 2014) and potential next steps to engage this audience in AIS prevention. New AIS waterfowl hunter outreach materials/sign templates will also be available for partners and agency staff.

Chemical Treatment of Curly Leaf Pondweed (CLP) and Eurasian Watermilfoil (EWM)

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Alternative AIS Management Strategies – This poster will explore hybrid or combination techniques for managing both Curly Leaf Pondweed (CLP) and Eurasian Watermilfoil (EWM), including the first ever partial overwinter drawdown in combination with a fall herbicide treatment on Montello Lake, producing beneficial results. Research will also show the effectiveness and benefits of contact herbicide (endothall) as well as systemic herbicide (imazamox) for CLP control by presenting preliminary data on the effectiveness of this combination on CLP for spot treatments.

Early Detection Monitoring, Identification Characteristics, and Management Techniques of Yellow Floating Heart

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Yellow floating heart was discovered on Lake Gordon in August of 2013. Lake Gordon is a 50 acre lake on national forest land with only a public beach and a small boat landing. This poster will take you through early detection monitoring, identification characteristics, management techniques, how the plant was introduced to the lake and the results of the hand-pulling.

Milfoil Weevils Reduce Biomass of Eurasian Watermilfoil

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We are testing the effectiveness of milfoil weevils at reducing the biomass of Eurasian water-milfoil (EWM). We added 5000 weevil eggs to each of eight EWM beds (two beds in four lakes) in 2013. Eight other beds in the same lakes served as controls. We compared the biomass of EWM with the combined biomass of all native plants. We also assessed the density of EWM stems and the density of weevils in all life stages in all beds. We have not seen any differences in stem density, weevil density or plant biomass between augmented and unaugmented beds. We are also investigating the number of weevil generations per season and are looking for weevils in EWM lakes that have been chemically treated and lakes with only northern water-milfoil.

Monitoring and Educational Protocol for New Zealand Mudsnail

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New Zealand Mudsnails were confirmed in a Wisconsin inland water for the first time in 2013. They were identified in a stream sample from Black Earth Creek (Dane county) collected in 2011. These snails have very broad environmental ranges, so they can theoretically live in streams, lakes and wetlands. This poster summarizes their ecology, the efforts to determine the extent of their presence in other Wisconsin waters and what's been done to contain the spread of this new invasive critter. Education and outreach was undertaken, and equipment cleaning protocols were thoroughly reviewed by the department. The poster will show sampling results and sample photos of these and other work efforts.

New Zealand Mudsnail Density Study in Black Earth Creek

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The New Zealand mudsnail, *Potamopyrgus antipodarum*, is an invasive species that is capable of outcompeting native invertebrates for resources. These snails can rapidly multiply both up and downstream once a location is invaded. They were recently discovered in Black Earth Creek in Southwestern Wisconsin. Very little is known about their distribution across substrates and affinity for one habitat type over another. This study was designed to determine the average density per unit area of New Zealand mudsnails for three substrate types: silt, sand, and macrophytes in Black Earth Creek, sampling at two different locations. Results suggest the highest average population densities were found in sandy substrate. However, there was no significant difference in the population densities among the substrate types ($p > .05$), but there was a difference found between the site locations ($p < .05$).

Strategizing to Control Non-native *Phragmites australis* in Wisconsin

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Non-native *Phragmites australis* has been advancing west into Wisconsin since invading its Great Lakes shores in the 1980s. Often these new expansions are along roadsides or as new populations at popular destinations along inland lakes. These new establishing populations of *Phragmites* are much smaller than the larger infested areas in the eastern part of the state and eliminating them should be possible through Early Detection / Rapid Response (EDRR) efforts. This presentation will show the extent of current efforts within the Lake Michigan basin and future plans for controlling this invasive species.

Topic: Ecology

Aquatic Plant Management

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Research scientists from the Wisconsin DNR Bureau of Science Services have been actively conducting aquatic plant research over the past decade. Their studies inform aquatic plant management decisions, help us plan for and prevent invasive species impacts, and allow people to use and better appreciate the beautiful lakes in our state. As a result, Wisconsin has been recognized as a leader in aquatic plant research and management. To share and celebrate a decade's worth of work, we have created an online portal

Science Centre's "A Standardized Protocol for Assessing Marine Debris in New South Wales Waters." Future research to be conducted in 2015 will include the investigation of more sites to get a more representational sample, and will involve the use of a Remotely Operated Vehicle (ROV) in addition to a dive team.

Cyanobacteria Toxins and Secondary Bioactive Metabolites Threaten the Health and Sustainability of Freshwater Ecosystems

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Large accumulations of cyanobacteria toxins and secondary bioactive metabolites (CTSMs) threaten the health and sustainability of freshwater ecosystems due to their harmful effects on aquatic biota. Here we provide a time series analysis of thirteen CTSMs at sub-daily scales in Lake Winnebago, a hypereutrophic environment in Wisconsin that serves as a drinking water resource to four major cities. Of the thirteen CTSMs targeted, all but two were detected in the lake on at least one date with max combined levels of 30.49 ng/ml. Temporal variability showed that CTSM levels varied by orders of magnitude over the course of hours. A bloom event was recorded by fluorometers. We observed that the maximum toxin concentration was most abundant prior to the onset of the bloom event, concomitant with diel cycling of the algal community. As such, toxin concentration was not correlative with either chlorophyll or phycocyanin, but rather with diel cycling.

Free Grazing Consultation to Farmers in the Mill Creek Watershed

Amy Thorstenson, Golden Sands Resource Conservation & Development Council, Inc.

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Mill Creek is a 303(d) listed impaired waterway that is a tributary to the Wisconsin River. With funding from a DNR Lakes Protection Grant, Golden Sands Resource Conservation & Development Council, Inc. began a project targeting free grazing consultation to farmers in the Mill Creek Watershed. The goal is to write 10 grazing plans and convert 1000 acres to permanent grass cover. When a field is converted from row crops to pasture, it reduces sediment loss by 2.2 T/ac/yr and phosphorus loss by 2 lbs/ac/yr, thereby reducing nuisance algae problems in neighboring lakes and rivers. Since fall of 2013, we have written 10 plans for farmers in the Mill Creek Watershed, totaling 445.84 acres. Estimated sediment reduction is 980 T/ac/yr and phosphorus reduction is 891 lbs/ac/yr. Several more plans are in process and slated for completion by the end date of the grant (6/31/15).

Long-term Ecological Data for Preventing and Decreasing Cyanobacterial Blooms

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Nutrient loading, global warming and lake physics are poised to impact cyanobacterial harmful algal bloom occurrence. We used an 18-year dataset (1995-2012) to identify interannual correlates of cyanobacterial biomass in a eutrophic lake. Spring and summer nutrient concentrations and other environmental variables were compared to cyanobacterial measurements (biovolume, cell density) throughout summer months. Statistical relationships were determined using Pearson's R Correlations ($p < 0.05$) to identify factors fluctuating with cyanobacterial biomass. Kjeldahl nitrogen, photic zone depth, metalimnion depth, TN, TP, Schmidt Stability, air temperature, and wind speed were positively correlated with cyanobacterial biomass at certain points throughout the summer ($0.47 < R < 0.79$). Air and water temperature, and number of ice-on days were negatively correlated with cyanobacterial biomass ($-0.77 < R < -0.49$). Future monitoring and management strategies could potentially use Long-Term Ecological Research data for preventing and decreasing cyanobacterial blooms in this lake.

Topic: Lake Shoreline Management

The Installation or Maintenance of Buffer Systems

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The installation or maintenance of buffer systems (i.e. terrestrial or aquatic vegetative strips) along the shorelines of lakes plays a crucial role in preventing residential pollution, such as oils, fertilizers and sediments, from entering the lake unfiltered. Despite these benefits, many homeowners do not maintain vegetative buffers, opting instead to mow straight down to the lake. In response to this reality, the Southeastern Wisconsin Regional Planning Commission (SEWRPC) developed a methodology which uses both aerial photography and a field assessment to quickly characterize a lake's shoreline, and applied this methodology to 24 lakes in the

Hydroelectric Dams Act as Barriers to Lake Sturgeon

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Hydroelectric dams act as barriers to lake sturgeon (*Acipenser fulvescens*) movement and prevent these fish from reaching riverine spawning habitat. We will pass 180 lake sturgeons upstream of two dams from Nov 2014 – May 2016 on the Menominee River, WI-MI. Our objectives are to determine: 1) if lake sturgeon passed upstream return downstream within 1 or 2 years of passage; 2) if lake sturgeon have the opportunity to spawn at least once above Park Mill Dam after passage; 3) if spawning opportunity, downstream return rates, and use of the downstream fishway at Park Mill Dam are related to biotic and abiotic factors; 4) if passage strategy can be manipulated to maximize the number of eggs deposited above Park Mill dam by fish that were passed upstream. We will also surgically fit 120 mature lake sturgeon with VEMCO® V16 acoustic transmitters and track their movements after passage.

Identify Road and Stream Crossings Statewide that Potentially Block or Hinder Fish Passage

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Culverts and other road and stream crossings can create significant barriers to the pass ability of fish and aquatic organisms to valuable habitat upstream along streams and rivers. The objective of this project is to identify road and stream crossings statewide that potentially block or hinder fish passage. Key measurements used to determine pass ability, such as slope and the overall drop of a culvert, are estimated by utilizing the most current LiDAR elevation data and computer GIS software. Once completed, the digital inventory could be used as a tool to identify and plan for the replacement or improvement of crossings that have the greatest negative impact on fish passage.

Introduction to Bladderworts: Bladderworts are Carnivorous Aquatic Plants

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These plants are very sophisticated mechanically, with the “trap” set at negative pressure, so that when the bladder closes, it literally sucks the prey in to be slowly digested. The closing process only takes ten to fifteen thousandths of a second. Wisconsin is home to about 8 species (there are over 200 worldwide). Bladderworts are unusual and highly specialized...and fascinating.

Known Distribution of a Newly Discovered Native (?) Macro-algae in Wisconsin

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The bearded stonewort, (*Lychnothamnus barbatus* (L. Meyen) H. von Leonhardi) (Charophyta: Characeae) is an endangered species throughout most of its scattered, worldwide distribution. In 2012, *L. barbatus* was documented in Adams County, Wisconsin, thousands of miles away from its nearest documented location. Between 2012 and 2014, a total of 13 lakes in Central Wisconsin have been documented to contain populations of *L. barbatus*. We continue to investigate the extent of *L. barbatus* distribution in Wisconsin, whether this species is native or exotic to Wisconsin, and how long it has occurred here.

Seasonal Movement of Smallmouth Bass in the Menominee River

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The Menominee River that borders the states of Wisconsin and Michigan supports exceptional fisheries for smallmouth bass. Fishery managers would like to know more about the seasonal movements of these populations in order to make more informed management decisions. Specifically, there is some concern that smallmouth bass congregate in relatively small areas during fall and winter months, making them more susceptible to harvest than other seasons. We used acoustic telemetry to determine if smallmouth bass in the Menominee River between Grand Rapids and Park Mill dams all moved to the lower, more lacustrine section of the river during fall. During May 2014, smallmouth bass ≥ 15 inches were collected and implanted with acoustic transmitters and

Understanding Population Dynamics of Sympatric Fishes

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Understanding population dynamics of sympatric fishes can be important for management. Walleye (*Sander vitreus*) are an important recreational species and a top predator in the systems they inhabit. Walleye growth can be highly variable among lakes suggesting that within-lake factors such as prey availability and quality are important. A statewide assessment of Cisco (*Coregonus artedii*), an important prey species for Walleye, was recently conducted in Wisconsin lakes to better understand the status of this important species. We used data from a long-term standardized Walleye survey program (Ceded Territory of Wisconsin; CTWI) and the recent Cisco assessment to determine Walleye growth trajectories among lakes with and without Cisco. Analysis of the data from 87 populations of walleye across the CTWI revealed that female walleye reach greater asymptotic lengths in lakes where Cisco were present, while male Walleye asymptotic length did not differ among lakes with and without Cisco. Common Walleye minimum length limits, 15 and 18 inches, were reached 0.6 and 0.9 years earlier in lakes with Cisco. Yellow Perch (*Perca flavescens*), another common prey item for Walleye, mean length was significantly lower than lakes without Cisco. This could further enhance Walleye growth as they generally select for prey < 130 mm. Significant variation in mean depth, maximum depth, and oxy-thermal parameters (TDO3) between lakes with and without Cisco also suggested that lake characteristics were important drivers of Cisco presence. Therefore, managing to maintain Cisco habitat in these lakes could help ensure fast growth and trophy potential of Walleye in these systems.

Topic: Watersheds

Citizen Lake Monitoring Network (CLMN) and the Water Action Volunteers Stream Monitoring Program (WAV)

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In order to address the growing concern for the health of aquatic life in surface waters brought on by drought, changing climate, and groundwater withdrawals, the Wisconsin Department of Natural Resources (WDNR) and the University of Wisconsin-Extension developed statewide volunteer lake-level and streamflow monitoring programs. These efforts build upon the existing network of volunteers in both the Citizen Lake Monitoring Network (CLMN) and the Water Action Volunteers Stream Monitoring Program (WAV). In a state with over 84,000 miles of rivers and streams and over 15,000 lakes, partnerships with local volunteers, nonprofit groups, and county staff are crucial for filling gaps in the current water level records. CLMN volunteers will pilot lake-level monitoring at several sites in Northwestern Wisconsin and WAV volunteers will conduct flow monitoring in priority counties around the state. This presentation outlines the monitoring protocols, quality assurance plan, and training workshops developed for citizens participating in these programs.

Impervious Surfaces: How They Impact Fish, Wildlife and Waterfront Property Values

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Virtually any form of shoreland development leads to more impervious surfaces, which are hard, manmade surfaces such as rooftops, driveways, parking areas and patios. More impervious surfaces and more runoff lead to fewer fish because: **more runoff** reduces water soaking into the ground, which leads to warmer water temperatures during dry periods and lower stream flows; **more runoff** from hot pavement and shingles makes the water hotter, which can kill species like northern pike and trout; **more nutrients** result in less oxygen in the water, which fish need to survive.

Mapping Walworth County Lake Watersheds

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Understanding that every site has a relationship to its adjoining watershed is key to cultivating actions that protect the health of Walworth County lakes, streams, wetlands and groundwater. Walworth County commissioned a watershed mapping project of the County lakes to access geographic data and create a data base of watershed owners and land users. This poster will exhibit a sample lake watershed map and describe the useful applications the mapping project will provide to Walworth County and County lake organizations for lake protection and management planning.