# DISCOVERING wetlands


## ABSTRACTS & PRESENTER BIOGRAPHIES

WISCONSIN WETLANDS ASSOCIATION

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# WEDNESDAY, FEBRUARY 19, 9:00 AM - 9:30 PM

**9:00 - 10:10 Plenary Session (La Crosse Center Ballroom)**

**9:00** **Welcome & Opening comments**

**9:20** **Conference Keynote: *Trapped by History: The Past and Future of the Upper Mississippi River***
**John O. Anfinson, PhD, National Park Service**

**10:10 - 10:40 Break (La Crosse Center Ballroom Foyer)** - *Thank you to J.F. Brennan Company, Inc. for their generous sponsorship of this break.*

**10:40 - 12:00 Concurrent Sessions**

| | Location: Ballroom A<br>**Invasive Species**<br>***Moderator: Randy Poelma*** | | Location: Ballroom B<br>**Wetlands and People**<br>***Moderator: Travis Olson*** | | Location: Ballroom C<br>**SPECIAL SESSION: Floristic Quality Assessment as a Wetland Monitoring Tool**<br>***Moderator: Tom Bernthal*** | |
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| **10:40** | **Salas** | Prioritizing large-scale invasive species management on tribal lands: Where do we start? | **Markham** | Keeping lakes and wetlands in the family: Sharing the magic through stories | **Matthews** | A null model approach for testing the validity of plant species' coefficients of conservatism |
| **11:00** | **Thobaben** | Evaluation of treatment cost and floristic quality in plant communities after 8 years of buckthorn removal | **Highsmith** | Discovering a world of wetland monsters | **Hlina** | Setting floristic benchmarks for the Lake Superior basin in northern Wisconsin |
| **11:20** | **Boos** | New wetland invaders: Revisions to Wisconsin's invasive species rule | **Conaway** | Bad River Ojibwe and the good seed: Stewarding water and wild rice with Bad River Youth Outdoors | **Bourdaghs** | Status and trends of wetlands in Minnesota: Statewide vegetation quality baseline |
| **11:40** | **Budyak** | Effects of selectively-targeted imazapyr applications on *Typha angustifolia* in species-rich wetlands | **Linton** | Fish, fowl, flood, water lily mud: Using poetry to get to the heart of wetlands | **O'Connor** | Using floristic quality assessments to assess biodiversity on riverine islands |

**12:00 - 1:30 Lunch (provided, Radisson Center Ballroom)**

**1:30 -3:10 Concurrent Sessions**

| | Location: Ballroom A<br>**Wetland Mitigation**<br>***Moderator: Doug Norris*** | | Location: Ballroom B<br>**SYMPOSIUM: Pool-scale Drawdowns to Restore Wetland Habitat in the Upper Mississippi River**<br>***Moderator: Stephen Winter*** | | Location: Ballroom C<br>**SPECIAL SESSION: Floristic Quality Assessment as a Wetland Monitoring Tool**<br>***Moderator: Tom Bernthal*** | |
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| **1:30** | **Miller** | The Watershed Approach Handbook: Restoring watershed health & services via regulatory & voluntary conservation | **Benjamin** | Breaking the rules: Tweaking water levels to benefit aquatic systems without impacting commercial navigation | **Bernthal** | Benchmarks 2016 – A strategy for setting floristic quality assessment benchmarks for Wisconsin wetlands |
| **1:50** | **Roth** | In-lieu fee mitigation in practice: The O'Hare modernization mitigation account | **Kennedy** | Pool-scale drawdowns on the Upper Mississippi River: Stakeholder involvement is the key to success | **Bourdaghs** | Development of a rapid floristic quality assessment |
| **2:10** | **Powell** | Assigning wetland mitigation credit in Minnesota: A mix of science and policy | **Kenow** | Vegetation response to pool-scale drawdowns on the Upper Mississippi River | **Patti** | Applying the FQA method to multi-year vegetation data along the restored Pike River in Mount Pleasant, WI |
| **2:30** | **Joyce** | Hydrology study for a proposed wetland mitigation bank along the Iowa River, Iowa: Lessons learned | **Yin** | Detecting the lasting effects of water level drawdown on aquatic vegetation in Upper Mississippi River Pool 8 | **Danz** | Floristic quality of Wisconsin coastal wetlands |
| **2:50** | **Parish** | Pebble Creek hillslope wetlands: Hydrologic significance and minimizing impacts from the West Waukesha bypass | **Winter** | Shorebird and waterfowl response to pool-scale drawdowns: Information available vs information needed | **Floristic Quality Assessment Discussion** | |

**3:10- 3:40 Break (La Crosse Center Ballroom Foyer)**

**3:40-5:00 Concurrent Sessions**

| | Location: Ballroom A<br>**Native Wetland Flora**<br>***Moderator: Dreux Watermolen*** | | Location: Ballroom B<br>**SYMPOSIUM: Pool-scale Drawdowns to Restore Wetland Habitat in the Upper Mississippi River**<br>***Moderator: Stephen Winter*** | | Location: Ballroom C<br>**SPECIAL SESSION: Wetland Delineation: Wetland Determination, Types, and Jurisdiction**<br>***Moderator: Tim Gerber*** | |
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| **3:40** | **Bart** | When the rich get productive, does native-species richness promote invasion resistance in WI fens? | **Newton** | Behavior of native mussels during a planned water level drawdown in Pool 6 of the Upper Mississippi River | **Eggers** | Evolution of the wetland delineation process in the United States |
| **4:00** | **Little** | Characterizing the vegetation communities of western Wisconsin ephemeral ponds | **Richardson** | Pool-scale drawdowns and nitrogen dynamics in the Upper Mississippi River | **Nedland** | An introduction to wetland delineation protocols in Wisconsin |
| **4:20** | **McConnel** | Cranberry marsh/native wild rice bed conversion project | **Custer** | Water level management and contaminant exposure to tree swallows nesting on the Upper Mississippi River | **Trochlell** | Wetland plant communities of the upper midwest |
| **4:40** | **Sulman** | Discovering Wisconsin's bur-reeds: Species diversity, growth form divergence, & habitat specialization | **Schlagen-haft** | Pool-scale drawdowns on the Upper Mississippi River - what next? | **Smith** | Clean Water Act jurisdiction: Which wetlands/waters are regulated? |

**5:00 - 6:30 Poster Session & Cash Bar (La Crosse Center Ballroom Foyer)**

**6:30 - 9:30 Banquet & Presentation (Ticketed event - Mississippi Riverview)**

**7:30** **Banquet Presentation: *The Life of a River Rat: Tales from the Upper Mississippi River***
**Kenny Salwey, the "Last River Rat."** *Thank you to J.F. Brennan Company, Inc., for their generous sponsorship of this event.*

# THURSDAY, FEBRUARY 20, 8:30 AM - 4:30 PM

**8:30-9:20 Plenary Session (La Crosse Center Ballroom)**

**8:30** Welcome

**8:40** Plenary Address: ***Wetlands of the Bad River Watershed***
**Tracy Hames, Executive Director, Wisconsin Wetlands Association**

**9:20 - 9:30 Break (La Crosse Center Ballroom Foyer)**

**9:30 - 10:30 Concurrent Sessions**

| | Location: Ballroom A<br>**Wetland Restoration I**<br>***Moderator: Nick Miller*** | | Location: Ballroom B<br>**Mining Discussion**<br>***Moderators: Tracy Hames & Erin O'Brien*** | | Location: Ballroom C<br>**Upper Mississippi River Wetlands**<br>***Moderator: John Wetzel*** | |
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| **9:30** | **Waupochick** | A landscape-scale wetland functional assessment and identification of potential wetland restorations sites for the Stockbridge-Munsee Community | **Tillison** | Wild rice ecosystem management in the Kakagon/Bad River Sloughs complex | **Winter** | Habitat management planning at the Upper Mississippi River NW&FR: Protecting wetland communities and species |
| **9:50** | **Strojny** | Different approaches to wetland restoration across Minnesota | Join Tracy Hames, Erin O'Brien, Naomi Tillison, and others for a discussion of wetland, watershed, and policy issues related to the proposed iron mine in Northern Wisconsin. | | **Frost** | History of the La Crosse River Marsh |
| **10:10** | **Henderson** | A wetland restoration in organic peat/muck soil | | | **Fleener** | Discovering the state waterfowl stamp program: Your stamp dollars at work |

**10:30 - 11:00 Break (La Crosse Center Ballroom Foyer)**

| | Location: Ballroom A<br>**Wetland Restoration II**<br>***Moderator: Sarah Johnson*** | | **(Working Group) My Healthy Wetlands: A Handbook for Wisconsin Wetland Landowners**<br>**Location: Boardroom A**<br>***Moderator: Katie Beilfuss*** | Location: Ballroom C<br>**Wetland Wildlife**<br>***Moderator: Dreux Watermolen*** | |
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| **11:00** | **Flood** | Monitoring and assessment of the Green Bay Cat Island Chain habitat restoration project | This working group session will build on the session held at WWA's 2013 conference. WWA staff will present the project's purpose, review the book's outline and components, and discuss the plans for distributing this handbook in Northeast Wisconsin. | **Casper** | Matching critical habitat needs to conservation opportunities: A new fish and wildlife planning tool |
| **11:20** | **Shaw** | Lessons learned in planting wetlands | | **Havranek** | Common Carp (*Cyprinus carpio*) mitigation in the restoration of Wild Rice (*Zizania palustris*) in shallow lakes |
| **11:40** | **Hutchins** | Time-lapse photography: A new technique to help the public discover wetland restoration and management in MN | | **Kirsch** | Tree species preferences of foraging birds during spring migration in Upper Mississippi River floodplain forests |

**12:00 - 1:30 Lunch (provided) and Presentation (Radisson Center Ballroom)**

**1:30 - 4:30 Field Trips & Working Groups**

**Working Groups**

| **Ramsar Nomination for Lower WI River (by invitation)**<br>**Location: Boardroom B**<br>***Moderator: Jean Unmuth*** | **Practitioners Working Group**<br>**Location: Ballroom A**<br>***Moderator: Heather Patti*** |
|---|---|
| This is the inaugural meeting of a group of individuals who are collaborating to complete a nomination package for the Lower Wisconsin River to be designated a Ramsar Wetland of International Importance. The Lower Wisconsin River was identified as a priority site by the Wisconsin Ramsar Committee for nomination for this prestigious designation. *Meeting is by invitation only.* | An opportunity for wetland practitioners – including consultants, federal, state, and local regulators, land managers, and others – to discuss current issues relevant to their daily work. The agenda will be set with the input of those who participated in a similar working group at recent WWA conferences. |

**1:30 - 4:30**

**Field Trips (all field trips will depart from the entrance to the La Crosse Center on 2nd Street)**

| ***Prior sign up required; check at registration desk for remaining availability.*** | ***Prior sign up required; check at registration desk for remaining availability.*** | ***Prior sign up required; check at registration desk for remaining availability.*** |
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| * **Exploring La Crosse Wetlands**<br>*Thank you to*<br>*Hey and Associates, Inc. for their generous sponsorship of this trip.* | * **Goose Island Restoration Project**<br>*Thank you to the*<br>*International Crane Foundation for their generous sponsorship of this trip.* | * **Root River Tract Restoration Project**<br>*Thank you to*<br>*American Transmission Company for their generous sponsorship of this trip.* |

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Please complete the conference evaluation coming to your email inbox.

Thank you!

**Barrette, Don**, Southwest Badger Resource Conservation & Development

**Forming weed management partnerships to control Japanese knotweed in the driftless area**

The Japanese Knotweed Project on Willow Creek, in Richland County, WI, illustrates cooperation among many partnership groups. It utilizes a multi-phase approach to address control issues of Japanese Knotweed infestations on Willow Creek. The poster will cover partnership organizing, project design, Japanese Knotweed best management practices, project successes, and project set-backs. The Japanese Knotweed Project on Willow Creek is an excellent example of cooperation between landowners and a number of different organizations, including the River Alliance, Trout Unlimited, Richland County Land and Conservation, WDNR, and Southwest Badger RC & D. The success of the project has proven that large weed management projects are possible in counties with limited resources.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Bart, David**, UW-Madison
Tara Davenport, UW-Madison
Quentin Carpenter, UW-Madison

**When the rich get productive, does native-species richness promote invasion resistance in WI fens?**

Environmental managers advocate creating wetlands rich in native species to suppress invasions, based on an observed negative relationship between native and invasive richness in some studies. However, productivity limits imposed by root-zone saturation and low nutrient availability may drive native richness higher and invasive richness lower in wetlands such as fens, accounting for this relationship. Plowing fens alleviates these two stressors, which would reverse this relationship if productivity limits are the main driver. We sampled 220 plots from 11 fens (4 plowed, 2 partially plowed, and 5 never plowed) to determine: 1) do relationships between native and invasive richness differ in plowed and never-plowed plots? 2) do the relationships change after accounting for saturation and nutrient availability?, and 3) how does the invasive community change in response to environmental variables? REML regression found a negative relationship between native- and invasive-richness in never plowed plots, but no relationship was found in plowed plots. REML multiple-regression found that after accounting for saturation and nutrients, there was no relationship between native and invasive richness. Rather, invasive richness was negatively associated with saturation in never-plowed plots and positively associated with nutrients in plowed plots. NMS found that *Typha* and *Phalaris* invaded in both dry and wet plots, while other species only emerged in drier plots. These data suggest that saturation, rather than native richness, promotes invasion resistance, and that hydrologic restoration should be the first goal for fen restoration.

*Native Wetland Flora, Wednesday, February 19, Ballroom A, 3:40 - 4:00 pm*

**Bednar, Karen**, UW-Madison
Jeremy Jones, UW-Madison

**Rediscovering trapping potential for phosphorus-laden sediment in an agricultural wetland on Dorn Creek**

Phosphorus-laden sediment erodes from upland agricultural areas, settles in low gradient stream channels during low flow, and flushes with high flows. Management practices to reduce phosphorus loading in watersheds need to account for phosphorus-rich transient sediment, as it plays a significant role in phosphorus budgets. Legacy sediment accumulation and subsequent flushing has resulted in a net export of sediment and phosphorus from the Upper Dorn Creek Wetland in Dane County, Wisconsin. To investigate management options to trap sediment in Upper Dorn Creek Wetland and thus mitigate phosphorus transport downstream to the Yahara Lakes, the UW-Madison Water Resources Management Practicum 2013 conducted field reconnaissance to estimate phosphorus concentrations and sediment volume, modeled outcomes of immobilizing sediment through a floodplain restoration scenario with the Soil and Water Assessment Tool (SWAT). Sediment cores showed total phosphorus (TP) from 1,000 mg/kg to 3,000 mg/kg. The highest concentration of TP associated with the highest volume of sediment was located in reed canarygrass infested Upper Dorn Creek Wetland area that exhibited the highest magnitude of scour and deposition. This area constituted a hotspot to model trapping efficiency of a proposed restored floodplain to promote slow flow and particle phosphorus settling. SWAT estimated 40% trapping efficiency, yielding a potential to remove 3,000 lbs of phosphorus/year by dredging .3 m of sediment across 2 hectares of the wetland. Preliminary estimates of $5.00-$15.00/lb for removal of phosphorus via intermittent dredging of the floodplain may result in a cost-effective way to reduce TP loading into the eutrophic Yahara Lakes.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Benjamin, Gretchen**, The Nature Conservancy
Tim Schlagenhaft, Aububon Minnesota
Mary Stefanski, USFWS
Kevin Kenow, USGS

**Breaking the rules: Tweaking water levels to benefit aquatic systems without impacting commercial navigation**

In the 1930s a series of 29 locks and dams were built on the Upper Mississippi River (UMR) to create a nine-foot navigation channel. Initial inundation from the dam construction created thousands of acres of new aquatic habitat but overtime the dynamic habitat patterns of channels, backwaters, sand bars, vegetated wetlands and wooded islands were lost as a result of stable heighten water levels. This change diminished seasonal water levels variation, increased wave erosion and caused filling of deep water channels and backwaters. River ecologists realized to bring back the once vibrant aquatic ecosystem they must recover essential natural processes and structures. The 1986 federally authorized program called Upper Mississippi River Restoration – Environmental Management Program (EMP) provided the ability to recover over 100,000 acres of structural river habitat but basic river processes were still absent. The need to restore more natural summer low water conditions to expose mud flats to drying and create the right germination conditions for aquatic plant seeds to flourish was essential. With careful consideration, the same locks and dams that caused ecological loss could be used to drawdown water levels, mimicking more summer seasonal levels and restore these vital plant communities. After almost 20 years of drawdowns, successful demonstrations have been conducted in 6 pools and one pool demonstration was abandoned. This presentation will focus on what has been done to implement this restoration tool on the large scale of the UMR.

*Pool-scale drawdowns in UMR, Wednesday, February 19, Ballroom B, 1:30 - 1: 50 pm*

**Bernthal, Tom**, WDNR

**Benchmarks 2016 – A strategy for setting floristic quality assessment benchmarks for Wisconsin wetlands**

To fully utilize Floristic Quality Assessment (FQA) as a routine monitoring and assessment method, benchmarks creating categories of plant community condition must be assigned to FQA metrics. This will be done through timed-meander surveys sampling wetland communities across an anthropogenic disturbance gradient, seeking “least disturbed” and “most disturbed” sites at each end of the gradient. If they show a significant correlation to disturbance, FQA response variables can be ranked and thresholds selected, representing breakpoints between low, medium, high and possibly additional categories of plant community condition. These categories give biological meaning to the results of FQA surveys. The landscape of Wisconsin varies greatly along geological, latitudinal and climatological gradients, resulting in a wide variety of wetland plant community types distributed in unique patterns. When the FQA was developed in 2003 a practical decision was made to generate only one coefficient of conservatism value per taxon, essentially treating the entire state as one regional flora. The expert group had to “average out” regional differences in species conservatism. This lack of regional consideration can be addressed by organizing benchmark surveys by ecological region. This talk recaps the regional data gathered to date and outlines a strategy and timeline for assigning FQA benchmarks by the end of 2016 for wetland plant communities in the four major EPA Level 3 Ecoregions (Omernick). Our strategy for defining wetland plant communities, evaluating disturbance regimes, and comparing wetlands across Ecoregions and WDNR’s Ecological Landscapes will be discussed, as well as anticipated applications of FQA methodology.

*Floristic Quality Assessment, Wednesday, February 19, Ballroom C, 1:30 - 1:50 pm*

**Boos, Tom**, WDNR
Terrell Hyde, WDNR

**New wetland invaders: Revisions to Wisconsin's invasive species rule**

In 2009, the WDNR established the Invasive Species Rule, which created a comprehensive, science-based system with criteria to classify invasive species into two categories: “Prohibited” and “Restricted." These regulations are aimed at preventing new invasive species from establishing in Wisconsin, and encouraging control of important but more widespread species. The process of joint interagency enforcement and outreach on the role of the public, businesses and partners are important to the success of this comprehensive approach. The changes being proposed today will enable the state to stay ahead of new invasions. The Wisconsin Department of Natural Resources is updating the state's Invasive Species Rule, ch. NR 40, Wis. Adm. Code. Proposed revisions include changing language to increase clarity, updating species names, and adding 85 new species. Many new wetland invasive plants are being considered, and this session will cover the proposed species and language changes. The revision process was initiated in 2011 and is scheduled to conclude by the end of 2014. Extensive public input is sought to ensure the continued success of the state's approach to invasive species.

*Wetland Invasive Species, Wednesday, February 19, Ballroom A, 11:20 - 11:40 am*

**Bourdaghs, Michael**, Minnesota Pollution Control Agency

**Development of a rapid floristic quality assessment**

In recent decades, a number of Rapid Assessment Methods (RAMs) have been developed for a variety of wetland monitoring and assessment purposes. The common thread of all RAMs is the reliance on coarse level information (typically qualitative) in exchange for the ability to provide results within a reasonable or attainable timeframe. The Floristic Quality Assessment (FQA) is also a popular approach to wetland condition assessment; but unlike a RAM, FQA typically requires intensive vegetation sampling performed by someone with a high degree of botanical expertise. The goal of this project was to determine if RAM concepts could be applied to the FQA. Through multiple field sampling trials, a simplified vegetation sampling approach was developed that relies on a plant species checklist and meander type sampling. The checklist has been limited to the more common and easier to identify species and the meander sampling can be done rapidly and varies according to site complexity. In addition, quantitative assessment criteria were developed based on a tiered Biological Condition Gradient conceptual framework using a large data set. The Rapid FQA should allow natural resource professionals that have a moderate level of botanical expertise to make quantitative and defensible wetland condition assessments for a variety of wetland monitoring and assessment contexts in a reasonable timeframe.

*Floristic Quality Assessment, Wednesday, February 19, Ballroom C, 1:50 - 2:10 pm*

**Bourdaghs, Michael**, Minnesota Pollution Control Agency

**Status and trends of wetlands in Minnesota: Statewide vegetation quality baseline**

Minnesota has recently begun to employ probabilistic surveys to track the overall status and trends of wetland quantity and quality to more comprehensively assess whether the no net loss policy goal is being achieved. Building off of the ongoing quantity survey and in conjunction with the US Environmental Protection Agency's National Wetland Condition Assessment, the quality survey was developed with the goal to describe the overall condition of all of Minnesota's wetlands at the statewide and major ecoregion (i.e., Northern Forest/Hardwood Forest/Prairie) scales. A total of 150 wetland sites were randomly selected (with a target of 50 in each ecoregion) to generate the unbiased condition estimates from field data. Field sampling was conducted in 2011-12, primarily consisting of vegetation surveys. Vegetation condition, as expressed by the Floristic Quality Assessment (FQA), was the primary indicator for the survey. The results from this first round of the survey will be presented. It is anticipated that future rounds of the survey will occur on a 5 year basis (with the next round of sampling scheduled for 2016) and provide the means to establish overall wetland quality trends.

*Floristic Quality Assessment, Wednesday, February 19, Ballroom C, 11:20 - 11:40 am*

**Budyak, Amanda**, Integrated Restorations, LLC
Craig Annen, Integrated Restoration, LLC
David Cordray, Integrated Restoration, LLC
Sean N. Longabaugh, Integrated Restoration, LLC

**Effects of selectively-targeted imazapyr applications on *Typha angustifolia* L. in species-rich wetlands**

Narrow-leaved cattail (*Typha angustifolia*) is an aggressive invader of wetland communities in North America. Substantial litter accumulation, prolific seed production, and rhizomatous expansion enable *T. angustifolia* to displace indigenous species assemblages and rapidly become the dominant species in a vegetation stand. Much of the previous research on suppression and eradication of this species has focused on well-established monotypic stands and there is a need to develop techniques for reversing invasions in mixed vegetation stands where *T. angustifolia* has not yet reached monotypic density. We conducted a feasibility study to evaluate the efficacy of using selectively-targeted applications of the broad-spectrum herbicide imazapyr to reverse a *T. angustifolia* invasion in a species-rich sedge meadow remnant in southeastern Wisconsin. In our initial surveys, *T. angustifolia* was rapidly expanding in area but with a diverse variety of remnant vegetation, including two species of conservation concern in Wisconsin (*Solidago ohioensis* and *Triglochin maritima*). We applied directed cut-surface treatments of 3.85% imazapyr to one out of every four *T. angustifolia* stems in July, when rhizome carbohydrate reserves were at a minimum. To curtail collateral damage, we added a biodegradable sticking agent at 4% to the imazapyr mixture and also employed a small-capacity compression sprayer modified with a polyethylene drip guard attachment. Directed cut surface applications of imazapyr reduced *T. angustifolia* stem density greater than 90% without reducing indigenous species density or diversity. We conclude that this treatment protocol was effective at selectively suppressing *T. angustifolia* in mixed vegetation stands.

*Wetland Invasive Species, Wednesday, February 19, Ballroom A, 11:40 am - 12:00 pm*

**Casper, Gary**, UWM Field Station
Andrew Struck, Ozaukee County Planning & Parks
Joanne Kline, WDNR
Tom Bernthal, WDNR

**Matching critical habitat needs to conservation opportunities: A new fish and wildlife planning tool**

We present on the development of a Fish and Wildlife Habitat Decision Support Tool (Tool). This GIS-based Tool addresses the role of wetland protection and restoration within the larger context of landscape-based fish and wildlife habitat conservation, using new data integration and discovery methods previously unavailable for regional planning. We discuss the development of fish and wildlife data layers and provide examples of their use in the Milwaukee River Basin, including how existing planning initiatives align with actual species distributions and their critical habitat needs. Preliminary Tool outputs have been used on two large scale conservation restoration projects on Mole and Ulao creeks in Ozaukee County to connect and enhance "under-performing" habitat with higher conservation value habitat areas, thereby building diverse habitat corridors in high priority areas. Application of this method led to new species being discovered and new conservation rankings being assigned to species, providing new insights into local conservation concerns. The Tool and its processes are new paradigms for conservation planning in Wisconsin, and have the potential to greatly improve the prioritization of conservation actions and provide a better return on investment when preserving, enhancing, and restoring fish and wildlife habitat. The methods for integrating critical habitat needs of rare fish and wildlife species into land use planning and conservation actions should have beneficial uses throughout the Upper Midwest, especially for NGOs and government agencies.

*Wetland Wildlife, Thursday, February 20, Ballroom C, 11:00 - 11:20 am*

**Church, James**, UW-Stout
Amanda Little, UW-Stout

**The Chippewa Moraine ephemeral ponds project**

Meta-community theory has been expanding rapidly in recent years. While theory for the structure of biological communities across landscapes has increased, empirical research has lagged behind. Wetlands in glaciated landscapes of Wisconsin provide an ideal and unique system to investigate meta-community structure. We are investigating the roles of local and landscape characteristics in structuring plant, amphibian, and macroinvertebrate communities in 56 wetlands in the Ice Age Scientific Preserve (Chippewa County). There is high variability among these wetlands in several environmental characteristics and community composition. This allows us to test different models simultaneously, addressing the roles of local and regional influences on community composition as well as potential biotic interactions. Further, future climate-change projections indicate potential threats to the biotic communities in these systems. Thus, to fully understand impacts on these systems necessitates baseline data and a comprehensive understanding of local and landscape community structure. Along with these investigations, we are using this project as a tool to educate students at UW-Stout on skills and techniques related to several different ecological sub-disciplines, as well as the importance of conserving these unique systems. This presentation will educate conference participants about the project and encourage development of future collaborations.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Conaway, Jessie**, UW-Madison, Bad River Band of Lake Superior Chippewa

**Bad River Ojibwe and the good seed: Stewarding water and wild rice with Bad River Youth Outdoors**

Bad River Youth Outdoors (BRYO) is a tribal youth watershed education and stewardship program piloted in the summer of 2013 at the Bad River Indian Reservation in northern Wisconsin. Based on guidance by tribal elders and community leaders, youth participated in place-based cultural activities. They monitored water quality of Bad River tributaries and removed invasive species from the wild rice beds in the coastal wetlands. BRYO participants collected photo-maps of areas of exceptional cultural significance for the Bad River community. The Bad River Reservation encompasses the delta of the Bad River watershed that runs into Lake Superior. The watershed is comprised of Class 1 trout streams, diverse wetland types, 5 large rivers, and the 16,000-acre Kakagon-Bad River Sloughs which is the largest undeveloped coastal wetland complex in the upper Great Lakes. The BRYO program pilot addressed social and environmental problems that the tribe currently faces, and contributes to research on water stewardship that incorporates native and western science. As the watershed is threatened by mining, climate change, and invasive species, it is essential to implement creative approaches to community conservation. Using mixed-methods, we evaluated changes in participants' watershed knowledge. Collaborative youth environmental education is a valid short- and long-term solution to increasing awareness and sense of personal and community responsibility. Presentation of this data in outreach products for the tribe empowers young people to advocate for their waterways and wetlands.

*Wetlands and People, Wednesday, February 19, Ballroom B, 11:20 - 11:40 am*

**Custer, Tom**, USGS
Christine Custer, USGS

**Water level management and contaminant exposure to tree swallows nesting on the Upper Mississippi River**

In order to increase aquatic vegetation production and thereby improve fish and wildlife habitat, the U.S. Army Corp of Engineers conducted a water drawdown on Navigation Pool 8 of the Upper Mississippi River during the summer of 2001. Flooding of previously dried out wetlands may increase the rate of mercury methylation and in turn make mercury more available to terrestrial vertebrates that feed in aquatic environments. Our objective was to determine if mercury and other contaminants were more available to vertebrates following the 2001 drawdown. Tree swallow (*Tachycineta bicolor*) eggs and nestlings were collected at two sites on Pool 8 and a nearby reference site in 2000, 2001, and 2002 and tissues were analyzed for inorganic and organic contaminants. Mercury and other contaminant concentrations did not increase in tree swallow eggs or nestlings following the drawdown. Additionally, no physical, physiological, or genetic responses to the drawdown were observed. Concentrations of inorganic and organic contaminants in tree swallow egg and nestlings were not at toxic levels. Hatching success did not differ among years and was comparable to a nationwide average.

*Pool-scale drawdowns in UMR, Wednesday, February 19, Ballroom B, 4:20 - 4:40 pm*

**Danz, Nicholas**, UW-Superior

**Floristic quality of Wisconsin coastal wetlands**

With US EPA funding, in 2011 a large consortium of wetland scientists from US and Canada began the first ever comprehensive Great Lakes basin-wide coastal wetland monitoring program. The goal of this 5-year project is to report on status and trends of wetland vegetation as well as other taxa including fish, macroinvertebrates, birds, and amphibians. We recently completed our third year of surveys and have visited over 300 wetlands throughout the basin, including numerous wetland sites along the Lake Superior and Lake Michigan coasts in Wisconsin. Vegetation sampling includes quadrat-based estimates of species cover in submergent, emergent, and wet meadow zones. Across the entire basin, wetlands with low floristic quality are concentrated in the southern Great Lakes where there are large amounts agriculture and urban development. Sites with high floristic quality are concentrated in the northern Great Lakes. In Wisconsin, sites in Green Bay, Door Peninsula, Bayfield Peninsula, and Duluth/Superior regions show mixed floristic quality depending on local site factors and legacy effects. In this talk, I'll provide a further look at our monitoring results and discuss primary trends in floristic quality and composition among Wisconsin's coastal wetlands.

*Floristic Quality Assessment, Wednesday, February 19, Ballroom C, 2:30 - 2:50 pm*

**Davenport, Tara**, UW-Madison
David Bart, UW-Madison

**Fens, plowing, and fire - Oh my!**

Fens are rare in Wisconsin and so maintenance of them and their flora is important. Fire is often used as a management tool to maintain native species richness and to prevent shrub encroachment. Fire was used in such a way on a partially plowed fen in Southern Wisconsin. Years of plowing could have left the native seed bank diminished compared to the never-plowed areas of the same fen. We were curious if plowed areas would respond differently than never-plowed areas to a fire. A burn was conducted in April 2013, burning the whole fen (plowed and never-plowed areas). Species richness, shrub cover, and hydrology were measured in the summer of 2012 and 2013 in 20 plots (10 plowed, 10 never-plowed). The plots were compared between years to see if any changes occurred post-fire. There was no difference in species richness and shrub cover between the two years within each plow group. There was a difference in hydrology but that was likely due to the increased amount of precipitation in 2013 compared to the drought of 2012. The lack of significant difference between never-plowed and plowed areas between the two years suggests that it'll likely take more than one year (and more than one burn) for vegetation in plowed areas to resemble vegetation in never-plowed areas.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Eggers, Steve**, USACE

**Evolution of the wetland delineation process in the United States**

Wetlands in the U.S. have been described, classified and mapped by various methods for various purposes. “Marshes” and “swamps” were mapped by the original land surveys around the time of European settlement. Circular 39 (1956) by the U.S. Fish and Wildlife Service established a classification system for wetlands. In "The Vegetation of Wisconsin" (1959), John Curtis described wetland plant communities, e.g., fens, sedge meadows and alder thickets. But it was passage of the Federal Water Pollution Control Act in 1972, as amended in 1977 and thereafter referred to as the Clean Water Act, which set in motion a need to develop a science-based, repeatable procedure to delineate the precise outer boundary of wetlands. This became critical because Federal and State wetland regulatory authorities extend to the outer limit of wetlands, but not into uplands/non-wetlands. The U.S. Army Corps of Engineers began experimenting with a “three parameter” approach to wetland delineation in the early 1980s culminating in the Corps of Engineers Wetlands Delineation Manual (1987). Today, that manual has been brought up to the state-of-the-science by 10 regional supplements across the 50 states. A concept of wetland soils, or hydric soils, evolved from a few rudimentary “field indicators” in the 1980s to today’s Version 7.0 of “Field Indicators of Hydric Soils in the U.S.” Similarly, a list of wetland plant species first drafted in 1986 evolved into today’s “National Wetland Plant List” with nearly 8,000 taxa each with an indicator status as to its probability of occurrence in wetlands. Evolution of the process for wetland delineation has been a fascinating journey of interest to all who are involved with wetlands.

*Wetland Delineation, Wednesday, February 19, Ballroom C, 3:40 - 4:00 pm*

**Fleener, Jason**, WDNR

**Discovering the state waterfowl stamp program: Your stamp dollars at work**

The State Waterfowl (Duck) Stamp Program has historically been one of the leading funding sources of wetland habitat management in Wisconsin. Since 1978, Wisconsin duck and goose hunters have provided a majority of funding for the program, yet many are not aware of the habitat projects that have been implemented with their stamp contributions. The waterfowl stamp program has funded a variety of project types, such as wetland restoration, wetland maintenance, invasive species control, conservation easements, and nesting habitat restoration. Although these habitat projects have targeted waterfowl conservation, they have a larger benefit to to the ecosystem serving other wildlife including neotropical migrants, amphibians, invertebrates, and native plant communities. As hunter numbers have declined in the state while stamp fees have remained static for several years, it is evident that we cannot rely entirely on hunter revenues to meet wetland conservation goals and maintain the current wetland infrastructure. The future of wetland conservation will greatly depend on revenue sources other than just state and federal stamp programs. However, the purchase of an annual Waterfowl Collectors Stamp is a great way for non-hunting wildlife and wetland enthusiasts to support wetland and wildlife conservation.

*Upper Mississippi River Wetlands, Thursday, February 20, Ballroom C, 10:10 - 10:30 am*

**Flood, Timothy**, UW-Green Bay
Patrick Robinson, UW-Green Bay

**Monitoring and assessment of the Green Bay Cat Island Chain habitat restoration project**

The restoration of the historic Cat Island Chain is intended to provide important ecological benefits to lower Green Bay. Barrier islands occurring in lacustrine ecosystems can facilitate submersed and emergent aquatic vegetation, reduce wave stress, and improve water quality. To better understand the ecological effects provided by the Cat Island Chain recreation, water quality variables and aquatic vegetation were examined along the protected and exposed areas of the reconstructed barrier islands. The objectives of the study were to evaluate any changes in water quality and aquatic vegetation due to the habitat restoration project. Data related to vegetation richness, wave velocity, and water clarity were collected. Hardstem bulrush test plots and seedbank germination trays were also monitored in the bay and under greenhouse conditions to examine if vegetation growth is inhibited by primarily biotic or abiotic factors. This research provides insights into the potential near-term and long-term ecological benefits of this large habitat restoration project.

*Wetland Restoration II, Thursday, February 20, Ballroom A, 11:00 - 11:20 am*

**Frost, Richard**, Myrick-Hixon EcoPark

**History of the La Crosse River Marsh**

The La Crosse River Marsh, which bisects the city of La Crosse, has been called "the finest urban wetland in the state." Its unique location makes it a very accessible wildlife and recreational area but it also makes it a prime target for developmemt. This program explores that inherent conflict: a marsh being where a city wants to be and a city being where a marsh wants to be. This marsh is top quality habitat for many species of mammals including beaver, muskrat, red fox, whitetail deer, and river otter. It also lies adjacent to UW-La Crosse, making it an important recreational and educational resource. In 1996, a a major north-south corridor freeway that was supposed to go through the marsh was stopped by public referendum, but the issue continues to simmer. A local marsh advocacy group, the La Crosse River Marsh Coalition, was formed to defend the integrity of the marsh and the DNR has proposed taking over protection of this land. This matter will continue to confront the city of La Crosse now and in the future.

*Upper Mississippi River Wetlands, Thursday, February 20, Ballroom C, 9:50 - 10:10 am*

**Gehant, Pamela**, UW-Stout
Amanda Little, UW-Stout
James Church, UW-Stout

**Seasonal trends in permanent and ephemeral wetland water chemistry**

The chemical composition of water within wetlands is important due to its effects on biota. We investigated seasonal differences in pH, specific conductivity, and dissolved oxygen between permanent and ephemeral wetlands within the Chippewa Moraine State Recreation Area. We created general linear models comparing the effects of wetland type (ephemeral vs. permanent), sample period (nested within wetland type), their interaction, and the covariate wetland area on the water chemistry attributes. Specific conductivity was significantly higher in ephemeral ponds with no significant change over the growing season. Dissolved oxygen was significantly higher in permanent ponds and showed a significant decrease between sample periods. pH showed no significant difference between permanent and ephemeral ponds, but showed significant fluctuation between sample periods. Similar trends were observed between the two types of ponds over time, with no significant interaction. These results are expected, because ephemeral ponds are smaller and have a higher specific conductivity due to substrate interaction. They also have higher temperatures, which are correlated with lower dissolved oxygen. The pH fluctuation between sample periods is unclear and may be due to vegetation or soil interactions. The hydroperiod of a pond is an important factor affecting water chemical composition, and our findings provide a framework for investigating relationships between water chemistry and biological communities.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Glenzinski, Brian**, Ducks Unlimited
Mike Mushinski, Brown County Land and Water Conservation Department

**Designing symbiotic fish and wildlife enhancements in Green Bay**

The Green Bay West Shores has a long history of wetland restoration and a recent history of pike spawning marsh restoration. Incorporating both types of restoration into a single project provides for a diverse partner group and ecological benefits for waterfowl, fisheries, and more. Slight alterations in design considerations can build project "buy in" while increasing ecological services. Sensiba Wildlife Area and Barkhausen Waterfowl Preserve are two excellent examples of projects with symbiotic fisheries and waterfowl objectives and will be the featured projects for this presentation.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Havranek, Tony**, St. Croix Chippewa Indians of Wisconsin-Environmental Department

**Common Carp (*Cyprinus carpio*) mitigation in the restoration of Wild Rice (*Zizania palustris*) in shallow lakes**

Clam Lake, in northwestern Wisconsin, is historically the largest wild rice producer in the state. However, in 2007 the wild rice crop on this waterbody failed dramatically beyond "normal" oscillations in wild rice productivity. Since that time, the St. Croix Chippewa and its partners have worked to restore Clam Lake by developing a plan to reduce common carp biomass, protect remaining wild rice resources, improve the fishery, and restore aquatic vegetation. Initial results show a greater than 30% reduction in common carp biomass, full restoration of 84 acres of wild rice, and increases in density and distribution of submergent aquatic vegetation, an important component of fish habitat. The St. Croix Chippewa and their partners continue this ongoing project with the ultimate goals of restoring roughly 300 acres of wild rice, increasing density and distribution of submergent aquatic vegetation, increasing the number of waterfowl observed during spring and fall migration counts, and increasing the number of adult bluegill observed during spring and fall netting and electrofishing surveys.

*Wetland Wildlife, Thursday, February 20, Ballroom C, 11:20 - 11:40 am*

**Henderson, Richard**, WDNR
Pat Trochlell, WDNR
Ken Wade, Self-employed

**A wetland restoration in organic peat/muck soil**

In spring of 2012, a wetland mitigation restoration was begun on a 5-acre deposit of peat/muck in the Driftless Area of SW Wisconsin. The site is ground-water fed under artesian pressure. Approximately 85% of the deposit had been tile-drained starting in1950 (or earlier) and was cropped until 1980, when partial failure of the tiles begun to occur. Since then, much of the upper soil layers have remained dry, facilitating continuing oxidation. In 2011, six ground-water monitoring wells and a vegetation sampling grid were established across the site. In March 2012, the tiles were removed. As the tiles were pulled, the trenches filled with water. Within hours, all low areas had standing water. Within 12 months, the soil was completely re-hydrated. In April, the site was planted with 118 pounds of seed of 54 species, and 1,070 root-plugs of 16 species. Within two growing seasons, the number of native species within quadrats went from 28 to 62 and the site's mean non-weighted Coefficient of Conservatism value went from 3.03 to 3.36. Reed canary-grass is the greatest challenge to recovery. It is slowly declining, its Importance Value has gone from 19% to 13%, due to competition and selective use of grass-specific herbicide, but it is still the second most prevalent species. In the first year of the restoration, several species of dragonflies, 8 species of toads & frogs, 4 species of waterfowl, 6 species of shorebirds, and a pair of sandhill cranes made regular use of the site and continued to do so in 2013.

*Wetland Restoration I, Thursday, February 20, Ballroom A, 10:10 - 10:30 am*

**Henderson, Richard**, The Prairie Enthusiasts

**Wetland and stream restoration projects in a prairie/grassland landscape**

Information is provided on the breadth of, and reasons for, stream and wetland restorations projects at The Prairie Enthusiasts' 570-acre Mounds View Grassland Preserve in Iowa County, WI. The projects include work on two cold-water streams, re-establishment of six floodplain wetlands, and recovery of a drained peat/ muck wetland that had been drained and cropped. One of the stream projects put flow back into cut-off channels and removed post-settlement slit deposits so as to re-connect the stream with its original floodplain topography and to re-expose floodplain associated wetland basins. The other stream project assesed the potential of streambank restoration followed by re-establishing a native brook trout population in a small ground-water fed creek.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Highsmith, Tod**, Wisconsin Wetlands Association

**Discovering a world of wetland monsters**

Stories of monsters and spirits that dwell in wet and mucky places are a staple of folklore around the world. In Britain, Jenny Greenteeth pulls careless children into the swamp and devours them. The Rusalki of Russia are the ghosts of drowned maidens who seduce young men and lure them to a watery grave. The Japanese Kappa is a mischievous wetland trickster with a taste for children and cucumbers. Though these tales may amuse us today, many are rooted in real-life concerns of our peasant ancestors, for whom wetlands were often dangerous places. An examination of stories from Europe, Asia, and Australia reveals that natural history frequently underlies superstition. And one seventeenth-century tale – that of the Tiddy Mun of England's coastal fens – traces directly to wetland management gone awry.

*Wetlands and People, Wednesday, February 19, Ballroom B, 11:00 - 11:20 am*

**Hlina, Paul**, UW-Lake Superior Research Institute

**Setting floristic benchmarks for the Lake Superior basin in northern Wisconsin**

This project has established non-forested and forested preliminary wetland condition benchmarks in the Lake Superior basin, using floristic quality metrics (FQA) by linking plant community composition to measures of anthropogenic stress. During the 2012 and 2013 field season, 272 Assessment Areas of nine types, alder thickets, shrub carrs, open bogs, northern sedge meadows, shallow water marshes, cedar swamps, black spruce swamps, black ash swamps and muskegs, were surveyed by a timed-meander sampling method and correlated with independent landscape and site level measures of stress. GIS measures of land disturbance and forest harvests of the past 15 years were assessed in buffers surrounding each Assessment Area. These values were used to sort candidate sites into "least disturbed"(or reference condition) sites and "most-disturbed" sites. Both a weighted (by % cover) and non-weighted Mean C and FQI values (which includes a species richness component) will be tested as preliminary benchmarks in determining low, medium or high wetland plant community condition.

*Floristic Quality Assessment, Wednesday, February 19, Ballroom C, 11:00 - 11:20 am*

**Huerth, Rachel**, UW-La Crosse
Nadia Carmosini, UW-La Crosse

**Determination of metal contamination in the La Crosse River Marsh**

Marshes are increasingly being recognized for performing essential ecological services, including the removal of pollutants from water. This function is particularly important in urban settings where increasing areas of impermeable surfaces cause storm water pollution to drain into nearby wetlands. Storm water runoff may contain toxic metals that can harm plant and animal life, and subsequently present challenges to the long-term health of natural urban wetlands and their capacity to function as water purifiers. The La Crosse River Marsh is a 1,077 acre urban wetland located in the middle of La Crosse, Wisconsin, and is part of the Mississippi River Floodplain. Many storm drains, from a variety of different land uses, discharge directly into the marsh. By analyzing the surface sediment (0-5 cm) and water at drain locations, this project is evaluating the current health of the marsh. Five different land-use types were identified around the marsh. For each land-use, three sites were selected adjacent to storm water discharge pipes where possible. Three replicate samples of sediment and water were collected at each site. Using microwave plasma – atomic emission spectroscopy (MP-AES), water was analyzed for total dissolved metals and total recoverable metals, and sediment was analyzed for total recoverable metals. Results from this research will help determine the health of the La Crosse River Marsh and will influence future management decisions in preserving this natural wetland.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Hutchins, Emily**, Minnesota DNR

**Time-lapse photography: A new technique to help the public discover wetland restoration and management in MN**

Time-lapse photography is a technique used to document changes in objects or events that occur slowly or over long periods of time. Photos from multiple years can be shown in a short video presentation. Time-lapse photography presents an opportunity to document and promote shallow lake management and wetland restoration in an innovative way the public can see and understand. Recording these activities via time-lapse photography documents a site before, during, and after management or restoration and quickly shows the hydrologic and vegetative changes that occur over a period of two to three years. The goal of this project is to establish time-lapse cameras at a diverse set of wetland restoration and shallow lake management projects occurring throughout Minnesota to serve as a new information and education tool. Additionally, the project serves as an assessment tool for wetland managers and researchers. Seven sites portraying a range of wetland types and management activities were selected from across the state, including a private wetland restoration, management of a shallow lake through water-level drawdown, and cattail management on public land. Cameras were installed in 2013 and set to take one photo per hour of daylight. Photos were downloaded monthly. Cameras will remain installed for 2-3 years. A sample video will be shown, and the finished product will be posted to the Minnesota Department of Natural Resources website, as well as other venues, for public viewing.

*Wetland Restoration II, Thursday, February 20, Ballroom A, 11:40 am - 12:00 pm*

**Jackson, Dan**, Volunteer for the WDNR

**The Wisconsin Odonata Survey: A successful application of citizen monitoring**

The Wisconsin Odonata Survey has now completed its 9th year. The survey was set up to promote citizen monitoring of a natural resource that has traditionally only been studied by professional biologists. The program has been a major success. After 9 field seasons, the number of observations contributed each year to the WI DNR Odonata sightings database by citizen scientists now far exceeds those contributed by paid staff. The number of participants is increasing each year and the effort has also resulted in the formation of the Wisconsin Dragonfly Society, which will hopefully generate even more interest in and contributions by citizen scientists in WI. Through the efforts of citizen monitors submitting data to the WI Odonata Survey, hundreds of new county sightings records have been added to the records of WI Odonata and therefore there has been a significant increase in knowledge of the ranges and habitat needs of Odonata in Wisconsin.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Janisch, Tony**, Bad River Watershed Association

**Establishing baseline water quality conditions in the Penokee Hills and headwaters of the Bad River Watershed**

When the threat to develop an open-pit taconite mine in the Penokee Hills emerged, the Bad River Watershed Association (BRWA), along with other organizations and agencies, began intensified data collection of the waters in the vicinity of the potential mining development. In 2011, BRWA began collecting macroinvertebrate and continuous temperature data at several locations in the Tyler Forks and Upper Bad River sub-watersheds. The purpose of this monitoring is to better understand the condition of these streams; prior to any degradation that might occur due to mining related activity. Of particular interest is the identification of potential trout streams, and the evaluation of streams' current temperature classification – cold, cool, or warm water – for accuracy. A Quality Assurance Project Plan was developed with the Wisconsin DNR to document all aspects of the project, including the purpose of the project, specific quality assurance and quality control measures, and all technical standard operating procedures. Of the 16 sites sampled in the past three years, we've found that most of the streams can be classified as cool or cold water, with maximum daily mean temperatures below 24.6˚C. BRWA discovered one perennial cold water stream that is not on current WDNR Surface Water Resources maps, raising the question of other potentially unknown cold water trout streams in the area. Our macroinvertebrate results show the waters to be in very good or excellent condition, with scoring below 4.50 according to the Hilsenhoff Biotic Index.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Joyce, Judith**, EarthView Environmental, Inc.

**Hydrology study for a proposed wetland mitigation bank along the Iowa River, Iowa: Lessons learned**

The primary reason for partial or total failure of wetland mitigation projects is faulty hydrology. This failure is often linked to improper design. Permittees and their wetland design consultants are often asked to provide a hydrology study to establish base line data. These studies vary from simple run-off and surface water collection models to extensive academic/research studies. The ultimate goals of the studies are to show that the design will meet the hydrology requirements for wetlands and be sustainable and self-maintaining, and to show by means of a water budget that there is sufficient water available to sustain a long term wetland. Although well defined in scientific literature (often for research purposes), practitioners have not been provided clear guidance on best management practices for conducting a hydrology study. Furthermore, regulatory reviewers are often not hydrologists and/or trained to critically review the hydrology study, which often seen as a check mark on a list rather than as a critical component to evaluate the validity of the design. A case study featuring a wetland banking site along the Iowa River, Iowa will be presented. This study, consisting of a water budget, monitoring wells, and historic stream gage data, showed that the hydrology of the site was controlled by groundwater, which correlates to the river elevation, rather than by surface water. In addition, the elevation of the river was a result of water being released from a reservoir upstream, rather than by precipitation. A discussion will follow about the process, lessons learned, and a proposal/request to create a standard procedure for conducting these types of studies.

*Wetland Mitigation, Wednesday, February 19, Ballroom A, 2:30 - 2:50 pm*

**Kennedy, Mike**, Citizen Volunteer
Tim Schlagenhaft, Aububon Minnesota

**Pool-scale drawdowns on the Upper Mississippi River: Stakeholder involvement is the key to success**

The purpose of our presentation is to promote the early involvement of non-agency people into the planning and execution of a large scale river drawdown. The affected users of the many functions of the resource, both private and commercial, can be one of the best assets of the project. They need to be involved to the degree of their interest and given an opportunity to provide information and feed back from themselves and their peer groups. A committee formed initially by volunteers will attract a wide variety of stakeholder citizens that are both local and seasonal users from a rather large regional area. This is good for the mix and dampens the effect of perceived ownership of the resource and thus a larger say, by adjacent land owners. These are public spaces and the benefits of drawdowns, especially when executed correctly and considered part of a long term resource management plan are economically justifiable due to the benefits in wetlands conservation, recreation and tourism usage as well as significant habitat improvement for migratory species. The visual results of new submergent and emergent plants that replace bland, shallow, silted backwater areas are food for the sole of the volunteer that joined the effort and now realizes the agencies planning, partnerships and work necessary to succeed in mimicking Mother Nature. The results of our success and the measurable increases in resource use are then multiplied by the number of UMR Pools, three to date, with planning underway for the fourth that can utilize this management tool.

*Pool-scale drawdowns in UMR, Wednesday, February 19, Ballroom B, 1:50 - 2:10 pm*

**Kenow, Kevin**, USGS
Larry Robinson, USGS
James Rogala, USGS

**Vegetation response to pool-scale drawdowns on the Upper Mississippi River**

The Upper Mississippi River (UMR) was transformed into a series of shallow navigation pools to facilitate commercial navigation in the 1930s. These pools initially supported a diverse complex of wetland habitats. Over time, habitat quality in these pools was degraded and large expanses of open water with little vegetation developed that were less beneficial to desired fish and wildlife. In an effort to enhance aquatic plant production and habitat diversity on the UMR, the U.S. Army Corps of Engineers St. Paul District conducted summer-time water level reductions (drawdowns) of Navigation Pools 5 (2005), 6 (2010), and 8 (2001 and 2002) of the UMR. The water level reductions were expected to improve conditions for seed germination and growing conditions for emergent and submersed aquatic vegetation (SAV). We assessed vegetation response to the drawdowns through (1) interpretation of high-resolution aerial photography, (2) field measures of the distribution of SAV, and (3) field measures of the composition and productivity of emergent perennial and moist soil vegetation on exposed substrates. A wide variety (>70 taxa) of moist soil, emergent, rooted floating aquatic, shrub, and tree species colonized substrates exposed during the drawdowns. Pool-wide drawdowns likely contributed to increases in deep and shallow marsh annual, submersed aquatic, and shallow marsh perennial plant communities. While increases in SAV were documented, it is difficult to attribute this response solely to drawdown effects when system-wide variability in growth is considered. Long-term persistence of emergent perennial and rooted-floating aquatic plant beds reestablished as a result of the drawdowns is addressed.

*Pool-scale drawdowns in UMR, Wednesday, February 19, Ballroom B, 2:10 - 2:30 pm*

**Kilibarda, Shelby**, UW-Stout
James Church, UW-Stout
Amanda Little, UW-Stout

**Tadpole size in permanent and ephemeral wetlands in western Wisconsin**

Possible tadpole species size differences between permanent and ephemeral ponds could be due to numerous environmental factors. Hydroperiod, temperature, predation, resources, and competition may all relate to tadpole size. The fact that ephemeral ponds are only temporary could be one of the major factors influencing the role of growth rate and body size. Studies have shown that predators, such as fish, are found in higher numbers in permanent ponds, and have been found to negatively impact the number of amphibian species. The surviving tadpoles in permanent wetlands would have a much longer time to grow there than in temporary wetlands, however. Tadpole size and species density were collected from 56 wetlands in the Chippewa Moraine Area in Western Wisconsin. Minnow traps were used in the wetlands to capture the tadpoles, which were then measured from the tip of the snout to the vent with a ruler. A permutational ANOVA analysis of data was conducted. Means between ephemeral and permanent wetlands were significant. Mean body size was larger in permanent wetlands than in ephemeral. Potential sources for this difference in body size may include wetland duration, resources, predator community, water temperature or competition. The implications of these findings will be discussed.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Kirsch, Eileen**, USGS, Upper Midwest Environmental Sciences Center
Michael J. Wellik, USGS

**Tree species preferences of foraging birds during spring migration in Upper Mississippi River floodplain forests**

Floodplain forest tree species composition and structure is changing on the Upper Mississippi River because of past management and altered hydrology. Information on trees that birds use for foraging during spring migration can guide management to enhance tree species richness and structure. We characterized tree species composition and structure and observed bird foraging behavior in five 40ha plots that represented the range of diversity and structure typical of Pools 8 and 9 between La Crosse, WI, and New Albin, IA, during spring 2010-2013. We recorded features of used trees to determine if birds preferred tree species or keyed in on phenology. The most common bird species that breed locally were American Redstart, Baltimore Oriole, Blue-grey Gnatcatcher, Warbling, Red-eyed and Yellow-throated Vireo, Yellow and Prothonotary Warbler, and Rose-breasted Grosbeak. The most common transient species were Yellow-rumped, Chestnut-sided, Magnolia, Tennessee, and Nashville Warbler, and Ruby-crowned Kinglet. Locally breeding species preferred silver maple and green ash which are dominant tree species in this system. However, the six transient migrant species preferred oaks and hackberry. Most bird species, except Yellow-throated Vireos, avoided cottonwood, except in 2013 when phenology was delayed due to cold spring weather. Temperatures during 2010 and 2012 were well above average during spring, whereas temperatures in 2011 were normal. Leaf development phenology was advanced in 2010 and 2012 and tree species preferences were more noticeable those years. In 2011 and 2013, when more trees of all species were in earlier stages of leaf development during the study, birds spread their foraging efforts more evenly among tree species.

*Wetland Wildlife, Thursday, February 20, Ballroom C, 11:40 am - 12:00 pm*

**Linton, Mary**, Snapping Linton Ecology
Mike Mossman, WDNR
Alice Thompson, Thompson & Associates Wetland Services

**Fish, fowl, flood, water lily mud: Using poetry to get to the heart of wetlands**

You protect what you love. Human relationship to wetlands is certainly about good science. It is also an affair of the heart – the lift of ducks off the surface of Horicon Marsh, a canoe through a riverside maple swamp, memory of being bitten by a toad bug at pond edge. Other forms of appeal may be more effective than a well-crafted scientific paper at moving the heart. We will present poetry by various authors, and may include Mary Oliver, Seamus Heaney, Mary Rose O'Reilly, Halvor Skavlem, Lorine Niedecker, Dan Gerber, Wendell Berry, and Haiku and Tanka masters. Handouts with wetland poetry will be available. "Fish, fowl, flood, water lily mud" from Paean to Place by Lorine Niedecker, Wisconsin poet.

*Wetlands and People, Wednesday, February 19, Ballroom B, 11:40 am - 12:00 pm*

**Little, Amanda**, UW-Stout
James Church, UW-Stout

**Characterizing the vegetation communities of western Wisconsin ephemeral ponds**

Little is known about the vegetation of forested ephemeral wetlands. These systems provide critical breeding habitat for amphibians and uniquely-adapted macroinvertebrates, but the vegetation remains a mystery. Ephemeral ponds have highly dynamic environmental conditions due to their small size and seasonal hydroperiod. Is there a unique suite of plant species that inhabit ephemeral ponds? What variability exists between the plant communities, and what environmental factors structure this variability? We sampled the plant communities of 40 ephemeral ponds and seventeen adjacent permanent wetlands in the Ice Age National Scientific Preserve (Chippewa County). Of the four species that were indicators of ephemeral pond communities (using indicator species analysis), two had OBL and two had FACW+ wetland indicator statuses. These species included *Fraxinus nigra*, *Ilex verticillata*, *Polygonum hydropiper*, and *Sium suave*, indicating that ephemeral ponds do have a unique, but limited, suite of wetland species. Environmental factors that were important indicators of ephemeral pond plant community structure included dissolved oxygen, specific conductivity, and the amount of tree cover. The most distinct type of ephemeral pond plant community was associated with forested cover, larger wetland size, and higher dissolved oxygen, and included many shade tolerant ferns and woody plants. Other types of ephemeral pond communities had highly variable and less coherent floras. Further research will elucidate relationships between plant functional groups and environmental factors.

*Native Wetland Flora, Wednesday, February 19, Ballroom A, 4:00 - 4:20 pm*

**Markham, Lynn**, Center for Land Use Education - UW Extension

**Keeping lakes and wetlands in the family: Sharing the magic through stories**

We'll explore the magic of kids' books—a simple way for every family to connect kids to nature. We'll do a show-and-tell of favorite wetland-themed books, share a few short video clips for kids, and talk about why we like these examples. Bring along your favorite books and ideas to share as well! Since 2008, Lynn has written an annual article for two statewide lake newsletters recommending great books about lakes for kids. In 2012 and 2013, Lynn partnered with Wisconsin Wetlands Association to recommend outstanding kids' books about wetlands and the animals that live in them. These articles are available in the fall newsletters of the UW-Extension Lake Tides at www4.uwsp.edu/cnr/uwexlakes/laketides/

*Wetlands and People, Wednesday, February 19, Ballroom B, 10:40 - 11:00 am*

**Martzke, Michele**, CB&I
Kari Harris, Canadian National Railway
Devin Sprinkle, Canadian National Railway

**Expediting difficult wetland mitigation and permitting with early agency coordination**

After Canadian National Railway (CN) acquired the Elgin Joliet & Eastern Railway (EJ&E) in 2009, CN planned a large-scale modification of Kirk Yard, located in Gary, Indiana. The Kirk Yard Improvements Project involved significant modifications to the yard to improve efficiency of train building operations. A wetland delineation conducted in 2010 revealed that Kirk Yard hosted remnant dune-swale habitat. Although many of the improvements could be constructed on existing track bed, some of the proposed structures directly impacted seven acres of federally regulated wetlands. Building on the relationship formed during the procurement process, CB&I and CN facilitated early coordination with USACOE, the Indiana Department of Environmental Management, and local environmental stakeholder organizations to discuss alternative mitigation options. Numerous meetings and site visits provided a platform for the various parties to understand the need for the rail improvements, communicate land management priorities, and provide input on the mitigation options. CN and CB&I informed USACOE of the mitigation proposal throughout the planning process, enabling USACOE to release the public notice within 60 days. USACOE rapidly issued the final permit document only 10 months after the CN's permit application submission. The final mitigation plan included permanent preservation of over 40 acres of high quality dune-swale habitat, invasive species management in nearby sensitive habitat, and creation of sand prairie wetland on CN property near Lake Michigan.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Martzke, Michele**, CB&I
Kari Harris, Canadian National Railway
Devin Sprinkle, Canadian National Railway

**Relocating and preserving dune-swale wetland vegetation: Achievements and lessons learned**

In early summer 2013, CB&I and Canadian National Railway (CN) jointly undertook a vegetation relocation project to preserve high-quality, dune-swale wetland vegetation from the Kirk Yard Improvements Project site, located in Gary, Indiana. CN acquired Kirk Yard in 2009 and planned a large-scale construction project to improve rail operations at Kirk Yard. Improvements included constructing over 7 miles of new track and several new buildings. A wetland delineation in 2010 revealed that the yard hosted remnant dune-swale habitat, and that a portion of this habitat was within the proposed construction zone. To preserve local genotypes and several rare species, CN and CB&I incorporated vegetation relocation into the wetland mitigation proposal of the Section 404 permit application. In June 2013, forb and graminoid species were transplanted using a tree spade truck approximately one mile from their position in Kirk Yard to the Indiana Department of Natural Resources (IDNR) Pine Station Nature Preserve. The relocated vegetation enhanced a 30-foot section of a swale. The relocation project was highly successful with virtually no plant mortality. Keys to the success of the relocation included the timing of relocation, soil and hydrology conditions at both the removal and installation sites, suitability of equipment, and cooperation between CN and IDNR. This presentation will detail the planning phases for the project, required coordination between the railway and IDNR, relocation methods, and post-relocation follow-up.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Matthews, Jeffrey**, University of Illinois
Greg Spyreas, University of Illinois
Colleen Long, University of Illinois

**A null model approach for testing the validity of plant species' coefficients of conservatism**

Coefficients of Conservatism (C-values), assigned to each plant species in a region or state, are integral to Floristic Quality Assessment. Botanists with expertise with the regional flora assign each species a C-value, usually on a scale of 0 to 10, based on the likelihood of finding that species in an undegraded natural area. A potential criticism of Floristic Quality Assessment is the subjective assignment of C-values. Our objective was to determine if C-values of individual species are indicative of the C-values of species with which they co-occur. If these subjectively assigned values carry meaningful information about plant assemblages, then species should tend to co-occur with species of similar C-value. We tested this hypothesis with occurrence data on 1,018 species in 388 forests and wetlands sampled for the Illinois Critical Trends Assessment Program. Using a null model approach, we found that species co-occurred with species of similar C-value more often than expected by chance. Further, we explored potential misassignment of C-values by characterizing species as under- or over-ranked relative to species with which they co-occurred. Woody plants, as a group, were under-ranked, i.e. their C-values were low, relative to herbaceous species. In addition several non-native species, which, by convention, are assigned a C-value of zero, were misranked relative to the communities that they occurred in. Despite their subjective basis, C-values do carry meaningful information regarding species assemblages. However, C-values of many species in our dataset appeared to be misassigned. Our methodological approach could be applied in other states or regions to objectively screen floras for misassinged C-values.

*Floristic Quality Assessment, Wednesday, February 19, Ballroom C, 10:40 - 11:00 am*

**McConnel, Brett**, Lac Courte Oreilles Band of Lake Superior Chippewa Indians

**Cranberry marsh/native wild rice bed conversion project**

This presentation will discuss the conversion of over 30 acres of existing cranberry beds to native wild rice on tribal lands in Northwest Wisconsin. Also, it will touch on organic cranberry farming, wild rice seedbanks, and the harmful effects of conventional cranberry farming on surface waters in Tribal watersheds.

*Native Wetland Flora, Wednesday, February 19, Ballroom A, 4:20 - 4:40 pm*

**McIntyre, Susan**, Illinois Natural History Survey, University of Illinois at Urbana-Champaign
Jeff Matthews, Univeristy of Illinois at Urbana-Champaign
Cassandra Rodgers, Illinois Dept of Transportation

**Evaluating success of four planting methods versus natural regeneration of a wet floodplain forest in Illinois**

In 1998, the Illinois Department of Transportation designed a wetland mitigation project to test five methods to restore a wet floodplain forest (balled and burlapped trees, bare root trees, seedlings, acorns/ delayed planting, and natural regeneration). Fifteen years later, we sampled the site to assess the relative success of the replicated planting treatments. We compared tree density, tree basal area, tree size classes, plant species richness, and biomass of invasive reed canarygrass (*Phalaris arundinacea*) in 250 $m^2$ sample plots in each treatment and an adjacent mature wet floodplain forest. We also compared the cost of tree establishment across treatments to determine whether the relative success of restoration justified the cost. Although some restoration ecologists have theorized that wetlands can recover with minimal active management, we hypothesized that treatments with the highest initial investment would produce communities most characteristic of the reference wetland. An analysis of variance revealed significant differences among treatments in tree basal area, biomass of reed canarygrass, and plant species richness. For every additional $10,000 per ha spent on restoration, richness increased by approximately 1.2 species per plot, reed canarygrass biomass decreased by 76 $g/m^2$, and tree basal area increased by 3.2 $m^2/ha^1$. Our results supported our hypothesis that increased investment provided the highest quality restoration relative to the reference site. Furthermore, even after fifteen years, treatment areas with low-cost restoration methods were far behind the high-cost methods and reference forest; these sites continued to be dominated by dense, species -poor stands of reed canarygrass and few trees.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Miller, Nick**, The Nature Conservancy

**The Watershed Approach Handbook: Restoring watershed health & services via regulatory & voluntary conservation**

The Watershed Approach Handbook advances watershed-scale planning to increase the success, relevance, and sustainability of wetland and stream restoration and protection projects. While it provides recommendations to implement a watershed approach for mitigation, as required by the 2008 Mitigation Rule for §404 of the Clean Water Act, its concepts and methods are also more broadly intended to promote watershed health and ecosystem services through combined voluntary and regulatory actions. The Handbook, produced by The Nature Conservancy (TNC) and Environmental Law Institute (ELI), reflects the technical guidance of partners in many agencies and organizations. It incorporates methods and lessons-learned from around the country, including watershed approach pilot projects of the Army Corps, EPA, TNC and ELI; it also draws from other planning experiences (e.g., §319 plans). At heart, the Handbook links the prioritization of suitable sites to watershed-specific needs (e.g., abating flooding problems, increasing certain wetland types). Major components of the Handbook include: 1) a "spectrum" of watershed planning approaches, from decision frameworks to watershed plans with prescribed outcomes; 2) "elements" of good watershed planning, from identifying watershed needs to assessing the potential of sites to meet those needs; and 3) case studies highlighting real-world examples of these approaches and elements. Mitigation policy has been shifting toward landscape-scale approaches, as evidenced by the 2008 Mitigation Rule and the recent call for such approaches by Secretarial Order from the Department of the Interior. Through these approaches, we can begin to minimize impacts while maximizing the outcomes of offsets at the watershed scale.

*Wetland Mitigation, Wednesday, February 19, Ballroom A, 1:30 - 1:50 pm*

**Nedland, Thomas**, WDNR

**An introduction to wetland delineation protocols in Wisconsin**

Accurate wetland boundary determination is critical for delineating the physical location of areas that fall under the jurisdiction of state and federal wetland laws. In Wisconsin, wetland delineation protocols follow federal guidance described in the Corps of Engineers 1987 Wetlands Delineation Manual as well as the Northcentral/Northeast and Midwest Regional Supplements to the Corps of Engineers Wetland Delineation Manual. These documents follow the three parameter approach for delineating the location of wetlands. The three parameter approach follows the premise that areas which have hydrophytic vegetation, hydric soils, and wetland hydrology are subject to state and federal wetland regulations. This presentation will provide guidance on identifying the presence or absence of each wetland parameter following federal guidelines. Special attention will be paid to guidance most applicable to Wisconsin. Difficult wetland situations, instances where one or more wetland parameter is missing or obscured, will also be discussed. The presentation will also provide a list of options to the audience for additional wetland delineation training opportunities.

*Wetland Delineation, Wednesday, February 19, Ballroom C, 4:00 - 4:20 pm*

**Newton, Teresa**, USGS, Upper Midwest Environmental Sciences Center
Steve Zigler, USGS
Brian Gray, USGS

**Behavior of native mussels during a planned water level drawdown in Pool 6 of the Upper Mississippi River**

Managers in the Upper Mississippi River (UMR) are using reductions in the River's water levels during summer to mimic historical water regimes and rehabilitate habitats for vegetation and other species. Concerns for the unintended effects of these actions on mussel populations threatened to halt these projects. Our objective was to characterize the survival and movement of 2 species in the UMR associated with a water level drawdown. During 2009 (no drawdown) and 2010 (0.3 m summer drawdown) we glued passive integrated transponder tags to 10 *Amblema plicata* and 10 *Lampsilis cardium*. Five sites were in areas minimally affected by the drawdown (reference), and 6 sites were in areas directly affected by the drawdown (treatment). Recovery of tagged mussels was >88%. Mortality was similar and low (~5%) among reference sites but was variable and relatively high (~27% in *L. cardium* and ~52% in *A. plicata*) among treatment sites. Net horizontal movements in *A. plicata* were most strongly associated with the drawdown, but both species moved considerable horizontal distances at treatment sites, presumably to reach deeper water. There were strong species-specific differences in the effects of the drawdown on mussels; *A. plicata* typically responded to the drawdown by vertical movement into the substrate, whereas *L. cardium* generally responded by horizontal movement to deeper water. No directionality of movement was observed in either species. Results from this study are being used by resource managers to better evaluate the effects of this management tool on native mussel assemblages.

*Pool-scale drawdowns in UMR, Wednesday, February 19, Ballroom B, 3:40 - 4:00 pm*

**Nieset, Julie**, Illinois Natural History Survey
Megan Engelhardt, Illinois Natural History Survey
Valerie Sivicek, Illinois Natural History Survey
Brian Wilm, Illinois Natural History Survey

**Floodplain wetland restoration: Comparing two large wetland mitigation banks along the Illinois River**

The Illinois Department of Transportation (IDOT) creates wetland compensation sites and mitigation banks throughout the state to offset the unavoidable loss of wetlands from transportation projects. Two large wetland mitigation banks have been established along the Illinois River – the 830-acre Morris site and 1643-acre La Grange site. Although seemingly similar, these two sites are vastly different in large part because of very different hydrologic regimes. Morris is located in Grundy County on the upper Illinois River, while LaGrange is located in Brown County on the lower reaches of the river. Although both sites flood regularly, LaGrange is characterized by extensive, long -term inundation as compared to Morris, where flooding is typically of much shorter duration. This differing hydrology is thought to significantly contribute to differing levels of success in these two mitigation banks. Substantial wetland area (1448 acres in 2013) has been successfully created at LaGrange, while at Morris, only a 42 acre area has consistently met jurisdictional wetland standards. Vegetation at Morris is generally characterized by higher species diversity and stronger dominance of perennial and invasive species, as compared to LaGrange, which is strongly dominated by disturbance-tolerant, annual forbs. Planted tree survival also varied greatly, with an overall survival of 63% at Morris and virtually no survival at LaGrange. Information gained from these studies can be used to better plan for successful river floodplain wetland restoration in the future.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**O'Connor, Ryan**, WDNR
Kevin Doyle, WDNR

**Using floristic quality assessments to assess biodiversity on riverine islands**

The Bureau of Land Management (BLM) owns over 600 riverine islands in Wisconsin, but data on their floristic quality and diversity is lacking, limiting effective management and priority setting. The Natural Heritage Inventory (NHI) used timed meander surveys and Floristic Quality Assessments to evaluate diversity and quality on 52 BLM-owned islands spanning five major river systems in Wisconsin. Islands ranged in size from less than 1 acre to over 100 acres. Floodplain forest was the predominant natural community. We hypothesized that because island biogeography theory states that larger islands tend to have higher species richness, and Floristic Quality Index (FQI) is, in part, a function of species richness, FQI would be higher on larger islands. Preliminary results showed that island size had minimal effect on species richness and FQI. Rather, species richness was correlated with island height, with taller islands having more species. Other factors such as habitat heterogeneity likely influence species richness and FQI. In our study sites, the combination of river banks, levees, mudflats, sloughs, sandbars, first bottoms, and second bottoms (terraces) supported species adapted to different niches. In order to accurately assess floristic quality, natural communities with microhabitats should be either a) stratified by habitat niche (and have clear boundary rules) or b) fully surveyed to encompass all unique microhabitats. Plot-based methods that do not fully encompass microhabitats may result in artificially low measures of diversity and FQI. Our results are applicable to a wide variety of wetland types including floodplains, fens, bogs, hardwood and conifer swamps, etc.

*Floristic Quality Assessment, Wednesday, February 19, Ballroom C, 11:40 am - 12:00 pm*

**Parish, Geof**, GRAEF

**Pebble Creek hillslope wetlands: Hydrologic significance and minimizing impacts from the West Waukesha bypass**

The initial phase of the project was to evaluate possible interactions of groundwater, wetlands and Pebble Creek, a Class II Trout Stream and Warm Water Fishery within the evaluated section of the planned West Waukesha Bypass. Start of construction is scheduled for 2015. The final phase was to quantify impacts from corridor locations on groundwater dependant wetlands, and guide adjustment of roadway designs to minimize the impacts. The hydrologic investigations included collection of soils, water depth, water quality, soil borings, and water table elevations, and groundwater modeling evaluations. Parallel investigations included preliminary wetland mapping, assessment of functions and values, and jurisdictional delineations. A groundwater discharge zone was identified in wetlands along the slopes adjacent to Pebble Creek. Two possible mechanisms describing groundwater supply to these wetlands were considered: (1) discrete layers of sandy sediments directing groundwater to the wetlands and (2) blanket deposits routing groundwater along the slope to the wetlands. Because these mechanisms are impacted differently from alternative alignments, the nature of the system providing water to the hillslope wetlands required investigation. The hillslope wetland seepage was projected to supply a significant fraction of Pebble Creek baseflow within a section of the study area. The plans and profiles of the viable alternatives were adjusted until probable direct impacts to the groundwater supplying the wetlands were minimized. The projected impacts of pavement on recharge to wetland groundwater were less than one percent and the modeled changes in wetland seepage to the creek were also less than one percent.

*Wetland Mitigation, Wednesday, February 19, Ballroom A, 2:50 - 3:10 pm*

**Patti, Heather**, R.A. Smith National, Inc
Alice Thompson, Thompson & Associates Wetland Services

**Applying the FQA method to multi-year vegetation data along the restored Pike River in Mount Pleasant, WI**

The Pike River Improvements Project is a multi-phased river restoration project in the Village of Mount Pleasant, Racine County, Wisconsin. This multi-disciplinary project has involved numerous partners, stakeholders, state and federal agency staff, and extends 5.2 miles from the headwaters of the Pike River south to where the river crosses the Racine/ Kenosha county boundary. Initially designed strictly as a "stormwater conveyance" project, the project evolved over time into a more integrated stream “corridor restoration” project that also focused on creation of riparian and floodplain wetlands, increased flood storage capacity, aquatic habitat restoration, and native prairie vegetation restoration. The Pike River project has been under construction since 2002, starting with Phase 1 along the northern portion. Annual vegetation monitoring of each phase occurs each year to evaluate the success of the project and recommend modifications and management activities as necessary. Meander surveys occur along each phase, noting all vascular native and invasive species present. The Floristic Quality Assessment (FQA) was applied to the species data to assess the plant community condition of each Phase, with the expectation that the older Phases (1-3) would exhibit a higher FQA value than the younger Phases (4-6). This talk highlights the vegetation monitoring and FQA results to date, and describes how FQA benchmarks could be utilized to monitor vegetation establishment along this active river restoration project.

*Floristic Quality Assessment, Wednesday, February 19, Ballroom C, 2:10 - 2:30 pm*

**Powell, Kenneth**, Minnesota Board of Water and Soil Resources

**Assigning wetland mitigation credit in Minnesota: A mix of science and policy**

Minnesota's wetland regulatory program was implemented in 1991. It includes a wetland mitigation component involving a series of actions that generate credit to offset approved wetland impacts. A fundamental and controversial aspect of wetland mitigation is the assignment of credit amount to various wetland mitigation actions (restoring, creating, preserving wetlands, etc.). State regulatory rules (specifically the Minnesota Wetland Conservation Act) and the St. Paul District Corps of Engineers mitigation policy for Minnesota have evolved over time in relation to credit allocation. Although current credit allocation rules are grounded in science, they have been influenced by policy determinations from the legislature and implementing agencies. This presentation discusses the origin and evolution of wetland mitigation actions and credit allocation in Minnesota, including its scientific basis and influencing policy decisions. It will also discuss recent controversies and dilemmas associated with local implementation of the rules, regional landscape differences, and consistency with the 2008 Corps of Engineers/EPA Federal Mitigation Rule.

*Wetland Mitigation, Wednesday, February 19, Ballroom A, 2:10 - 2:30 pm*

**Richardson, William**, USGS, Upper Midwest Environmental Sciences Center

**Pool-scale drawdowns and nitrogen dynamics in the Upper Mississippi River**

Nitrogen (N) has been linked to eutrophication in the Gulf of Mexico and as a result there is increased interest in managing and improving water quality in the Mississippi River system. Water level drawdowns are being used more frequently in large rivers to improve vegetation growth and wildlife habitat; such actions were also hypothesized to promote large-scale N-removal. We selected two areas of the Upper Mississippi River system (Navigation Pool 8 and Swan Lake, IL) to examine the effect of drawdowns on nitrogen cycling. Navigation Pool 8 experienced summer drawdowns in 2001 and 2002, and certain areas of Swan Lake have been drawn down annually since the early 1970s. In a 2002 Pool 8 study we determined the effects of sediment drying and rewetting resulting from water level drawdown on (1) patterns of sediment nitrification (conversion of ammonium to nitrate) and denitrification (conversion of nitrate to dinitrogen gas) and (2) concentrations of sediment total nitrogen, nitrate, and ammonium. Sediment ammonium decreased significantly in Pool 8 during periods of desiccation, while sediment nitrate and denitrification increased, although there was no reduction in total sediment nitrogen. Ammonium in sediments that have dried annually in Swan Lake appeared lower but was not significantly different from sediments that remain wet. The reduction in sediment ammonium in Pool 8 was likely a result of increased plant growth and nitrogen assimilation, which is then re-deposited back to the sediment surface upon plant senescence, resulting in a net gain of sediment nitrogen. Similarly, the Swan Lake study suggested that drawdowns do not result in a long term reduction in sediment N.

*Pool-scale drawdowns in UMR, Wednesday, February 19, Ballroom B, 4:00 - 4:20 pm*

**Roth, Joseph**, Openlands

**In-lieu fee mitigation in practice: The O'Hare modernization mitigation account**

Openlands, in conjunction with the Chicago District of the U.S. Army Corps of Engineers and Chicago Department of Aviation, administers the O'Hare Modernization Mitigation Account (OMMA). OMMA was created to identify and successfully implement a portion of the overall wetland mitigation required under the Section 404 permit issued for the O'Hare Airport Modernization Program. This presentation will touch on OMMA's history and how the account is structured and administered, and will provide details of the 5 restoration projects funded and underway through OMMA. Approximately 1,000 acres of land in northeastern Illinois are presently being restored to native plant communities through the 5 OMMA projects.

*Wetland Mitigation, Wednesday, February 19, Ballroom A, 1:50 - 2:10 pm*

**Rudolph, Nick**, UW-Whitewater
Katie Hausmann, UW-Whitewater

**Spatial ecology, habitat use and survival rates of headstarted Blanding's turtles (*Emydoidea blandingii*)**

The Blanding's turtle (*Emydoidea blandingii*) is a rare species in Wisconsin. State populations have declined as a result of habitat destruction and high nest/juvenile predation. Headstarting (rearing of eggs/juveniles in captivity to reduce predation rates) is a conservation tool frequently employed for turtles. This technique presumably increases turtle size, making young turtles more difficult for predators to consume. However, limited research has assessed the behavior of headstarted Blanding's turtles post-release. Our goal was to obtain this information by tracking turtle movements and habitat selection and by assessing survival. We collected Blanding's turtle eggs from wild -caught females in 2012, and eggs/juveniles were raised in captivity. We affixed 19 with radio transmitters for release in summer 2013. Released turtles were re-located once/week with radio telemetry. The geographic position, habitat characteristics, and behavior associated with turtles were recorded during each relocation (avg. number of relocations/turtle: 10.2). After a single tracking season, 5 of the 19 turtles released had succomed to predation (73.7% survival) and 3 were lost due to equipment failure. We frequently found turtles in permanent wetlands dominated by sedges and reed canarygrass. Tracked turtles also moved less than expected (average home range size: 5604.36 $m^2$). In a previous study by Glowacki & Kuhns (2010), headstarted Blanding's turtles had an average home range of 43,980 $m^2$. This past study also recorded a lower survival rate (66%). The continuation of our study includes a closer analysis of the microhabitats and additional years of radio-tracking turtles to decipher long-term trends.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Salas, Dan**, Cardno JFNew
Randy Poelma, Ho-Chunk Nation Dept. of Environmental Health

**Prioritizing large-scale invasive species management on tribal lands: Where do we start?**

Managing invasive species effectively requires a complex array of decisions related to conservation priorities, resource availability, and target species of concern. Managers are continually faced with conflicting needs in terms of land use, site goals, populations impacted, and treatment costs when determining when, where, and how to control invasive plant species. In 2013, the Ho-Chunk Nation, supported by funding provided by the Bureau of Indian Affairs, inventoried over 4,300 acres of Tribal-owned lands for invasive plant species. The intent of these surveys was to identify and prioritize invasive species populations for future management. Cardno JFNew assisted the Tribe in completion of surveys and development of a decision making approach to prioritize invasive plants in light of Tribal conservation objectives and land use planning. The results of this effort identified over 900 populations of invasive plants across an array of natural communities including wetlands and uplands. Populations ranged in size and density from a single plant, up to thousands. Prioritization of inventoried populations relied on aspects of structured decision making and invasive species biology to rank the 900 occurrences and 87 parcels surveyed. The role of wetland habitat conservation rankings and the rare species they support were considered as part of this assessment and evaluation. This presentation will highlight the development of the prioritization method based on Tribal management objectives, invasive species identified, geospatial mapping, conservation targets ,and land use planning, and will present subsequent results and recommendations.

*Wetland Invasive Species, Wednesday, February 19, Ballroom A, 10:40 - 11:00 am*

**Schlagenhaft, Tim**, Audubon Minnesota
Gretchen Benjamin, TNC

**Pool-scale drawdowns on the Upper Mississippi River - what next?**

Pool-scale drawdowns on the Upper Mississippi River have been successful in restoring emergent aquatic vegetation and have had a positive effect on fish and wildlife. While much is known about drawdown effects, there remain several important unanswered questions including optimum extent (depth), duration (length of time), and frequency of drawdown. In addition, effects on fish, mussels, shorebirds, and other wildlife need to be further understood. Also, implementing drawdowns has been time consuming and challenging, often taking 4-5 years to plan and conduct individual pool-scale drawdowns. Challenges include commercial navigation needs and costs for supplemental dredging, recreational boating issues, and Corps of Engineers operating policies. The Water Level Management Task Force is working to learn more about the effects of drawdowns and to shorten the time frame for drawdown planning and implementation. An adaptive management strategy was developed by the Task Force to address unanswered questions, and a process to make drawdowns operational is being considered. This presentation will detail these strategies to improve our knowledge about drawdown effects and make drawdown implementation easier.

*Pool-scale drawdowns in UMR, Wednesday, February 19, Ballroom B, 4:40 - 5:00 pm*

**Schumacher, Stacy**, WDNR
Pat Trochlell, WDNR

**Proposed additions to the Invasive Species Rule (NR40): Prohibited and restricted wetland plants**

The Department of Natural Resources is proposing to revise Wisconsin's Invasive Species Rule (ch. NR 40, Wis. Adm. Code). The proposed changes include delisting 2 species, changing the regulated status of 4 species, listing 51 new prohibited species, listing 32 new restricted species, and listing 2 species as split-listed (prohibited/restricted). The changes would include listing 10 new wetland plant species as restricted and 20 new wetland plant species as prohibited. While some species proposed for addition, such as yellow flag iris or moneywort, are common garden escapees, some of the prohibited additions have not been observed growing in Wisconsin and considered "early detection species." The DNR's wetland invasive species team is encouraging those that work or recreate in wetlands to become familiar with the proposed new regulated wetland species. They will have a poster showing photos, brief descriptions, known state distribution maps, and contacts for more information on these wetland plants.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Schumacher, Stacy**, WDNR
Pat Trochlell, WDNR

**Promoting "Best Management Practices for Preventing the Spread of Wetland Invasive Species" to new audiences**

The Wisconsin DNR worked with others to develop a set of Best Management Practices for Preventing the Spread of Invasive Species in Wetlands. Following a period of review, DNR finalized a current set of BMP's for promotion to anyone that works, recreates or studies wetlands. These BMP's are intended to act as a guide to facilitate the thought process of limiting the introduction and spread of invasive species. They are not intended to be prescriptive, as each situation requires different actions, and different audiences will have different BMPs that apply to their activity. The focus of these BMPs is on terrestrial wetland invasive species rather than submerged aquatic species such as Eurasian water milfoil. Naturally, there will be invasive species prevention practices that are shared between aquatic and terrestrial invasive species; the appropriate practices for the specific site conditions, any invasive species present, and each activity type should be utilized. We are keen for any group that works or plays in wetlands to become familiar with these BMPs, and for them to consider their activities and how they could use the BMPs to avoid spreading invasive plants to or from wetlands across WI. An example of how to select and tailor certain relevant BMPs for a particular audience (contractors) is provided to relate the BMPs to outreach and education work.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Shaw, Dan**, Minnesota Board of Water and Soil Resources
Carol Strojny, Minnesota Board of Water and Soil Resources

**Lessons learned in planting wetlands**

The Minnesota Board of Water & Soil Resources is a state agency that has a strong role in providing guidance on native plant community management and establishment to conservation practitioners throughout the state. In turn, these practitioners provide feedback to the board on what conservation practices work well for them. We have been progressively incorporating this information into a unique "What's Working" website focused and a Minnesota Wetland Restoration Guide to promote successful restoration strategies. This presentation will highlight the top lessons learned for overcoming challenges often encountered in planting wetland areas, based on the experiences of our staff and other restoration professionals in Minnesota. Consideration of these lessons learned will result in increased cost-effectiveness and attainment of realistic goals and outcomes.

*Wetland Restoration II, Thursday, February 20, Ballroom A, 11:20 - 11:40 am*

**Siwula, Patrick**, UW-La Crosse
Nadia Carmosini, UW-La Crosse
Anita Baines, UW-La Crosse

**The impacts of storm water runoff on sediment microbial community structure and function in an urban wetland**

Influxes of urban storm water can contain high amounts of debris, nutrients, and pollutants and can be a major source of contamination for aquatic systems. Sediment microbe communities provide a useful tool for studying this impact as they physically cannot avoid contact with influxes of storm water and they have short generation times, allowing for community structure to mirror changes in the environment. These changes can be dependent on the chemical composition of storm water runoff in question, which is dictated by the land use of drained areas. The site in question, the La Crosse River Marsh, is a 1,077 acre wetland located in the middle of the city of La Crosse and is a model study site as there are numerous point sources of runoff coming directly from the city. Five different land use types were selected to represent different types of runoff entering the system (control, commercial, commercial/ residential, residential, transportation) with the control site representing an area receiving no direct runoff. In order to quantify changes to sediment-dwelling microbial communities as a result of storm water runoff, Biolog Ecoplates were used to build a functional profile based on carbon utilization. Significant differences were seen in total carbon utilization ($F_{4,10}$=3.924, P<0.05) as well as niche width between sites ($F_{4,10}$=3.429, P<0.05 ). Clustering analysis revealed that microbial communities found at the control site are least similar to each other ($r < 0.58$) while communities from the transportation land use site are most similar to each other ($r < 0.76$). Significant differences were also seen in total culturable microbial density, as quantified by plating on selective/general media ($F_{4,20}$=6.637, P<0.001).

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Skawinski, Paul**, Golden Sands RC&D Council
Chris Hamerla, Golden Sands RC&D Council

**Manual removal of Eurasian watermilfoil: Strategies for reduction or elimination of early populations**

Manual removal of Eurasian watermilfoil (EWM) (*Myriophyllum spicatum*) can be a successful tool to reduce or eliminate EWM from a water body. Traditionally, expensive chemical herbicides are used to manage EWM populations, but early, scattered populations can often be controlled by manual removal at a lower cost, with minimal or no non-target impacts to the ecosystem. Using these techniques, Eurasian watermilfoil appears to have been eradicated from the 11-acre Rocky Run Wetland in central Wisconsin (3.5 years without EWM being observed), and several other nearby water bodies are on the same track. A brochure and YouTube instructional video (search "EWM manual removal") were created to further encourage lake and wetland managers to explore this viable control technique.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Slate, Jennifer**, Northeastern Illinois University

**Diatom and sponge bioindicators preserved in sediment from Volo Bog in northern Illinois**

As Illinois's only quaking bog, Volo Bog Nature Preserve is a National Natural Landmark. The acidic water, caused by the floating Sphagnum mat, allows a unique aquatic community. To determine the potential for using bioindicators to infer changes in water chemistry over time, I analyzed diatoms and sponges from 4 m of sediment deposited in the bog. Both diatoms and siliceous sponge spicules were well-preserved throughout the sediment core. Species indicative of acidic conditions, including the diatoms *Eunotia formica* and *Pinnularia abaujensis* var. *subundulata* and the sponge *Anheteromeyenia ryderi*, were common. Other common diatoms included *Amphora libyca*, *Encyonema silesiacum*, *Gomphonema angustum*, and *Stauroneis phoenicenteron* f. *gracilis*. The well-preserved diatom and sponge remains indicate that Volo Bog sediment can be used in paleolimnological studies to infer changes in water acidity over time.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Smith, Amanda**, UW-Stout
James Church, UW-Stout
Amanda Little, UW-Stout

**Environmental factors influencing wood frog (*Lithobates sylvaticus*) tadpole size**

Ephemeral wetlands provide many ecological benefits, however they often remain unprotected by state or federal regulations. This study evaluated ephemeral pond environmental factors that influence *Lithobates sylvaticus* tadpole size. Size of tadpoles may relate to survival rate. Smaller tadpoles tend to morph into small frogs that are more prone to predation due to lack of speed and agility. The survival rate of *L. sylvaticus* is important because their populations are a significant contributor in maintaining a sustainable food chain; therefore populations of *L. sylvaticus* are important for maintaining healthy ephemeral wetland habitats. This study was conducted in the Chippewa Moraine State Recreation Area in Chippewa County, Wisconsin in 56 wetlands. Tadpole snout to vent lengths (SVL) were surveyed in each wetland using minnow traps collected after 24 hours of being submerged. Environmental factors including dissolved oxygen, canopy cover, pH, and chlorophyll-A were quantified using standard field and laboratory procedures. A stepwise selecting multiple regression indicated a significant positive relationship between SVL and pH. The pH of the wetlands may serve as a proxy for the relationship between immediate upland landscapes and the SVL of *L. sylvaticus* tadpoles. Implications of these findings as it relates to conservation of these wetlands will be discussed.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Smith, Tim**, USACE, St. Paul District

**Clean Water Act jurisdiction: Which wetlands/ waters are regulated?**

Section 404 of the Clean Water Act regulates discharges of dredged/fill materials in waters of the United States. However, waters of the U.S. do not include all wetlands/waters. Since 1972, the process to determine which wetlands/waters are jurisdictional has continually evolved due to a series of court cases, Congressional amendments, regulations and policy decisions. Key components include the "migratory bird rule" (1986) and NRDC v. Calloway (1975) as well as three decisions by the U.S. Supreme Court (U.S. v. Riverside Bayview Homes [1985], SWANCC v. USACE [2001], Rapanos v. U.S. [2006]). In particular, SWANCC and Rapanos created new terminology and standards to apply for the determination of Clean Water Act jurisdiction. The end result has created a challenging time for both regulators and the regulated public. This presentation will address the current process for making a Section 404 jurisdictional determination.

*Wetland Delineation, Wednesday, February 19, Ballroom C, 4:40 - 5:00 pm*

**Strojny, Carol**, Minnesota Board of Water and Soil Resources
Dan Shaw, Minnesota Board of Water and Soil Resources

**Different approaches to wetland restoration across Minnesota**

The Minnesota Board of Water & Soil Resources is a state agency that reviews and develops wetland restoration plans throughout the State for conservation and regulatory programs. Minnesota has a diverse landscape consisting of four major ecological provinces, each with a different variety of plant communities and different disturbance histories. Native seed bank potential, invasive species pressure, and tree and shrub colonization will vary when conducting restorations in these different regions. These regional characteristics affect the choices we make while planning and implementing wetland restoration projects. This will be illustrated with examples from our experience conducting restorations in different regions of Minnesota including sites that had been in rice production, sod farms, and row cropping, focusing on the vegetation restoration component of projects.

*Wetland Restoration I, Thursday, February 20, Ballroom A, 9:50 - 10:10 am*

**Stushek, Kaycie**, Golden Sands Resource Conservation & Development Council, Inc.

**Japanese knotweed (*Polygonum cuspidatum*) early detection removal methods for volunteers**

Japanese knotweed is an invasive perennial plant that has been invading wetland areas. When stands are removed early and are actively monitored, they are much more easily controlled. This poster discusses removal methods of the plant, focusing on methods that can be carried out by previously untrained volunteers. Examples of removal and monitoring successes and failures are included.

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Sulman, Joshua**, Stantec
Bryan Drew, University of Florida
Kenneth Sytsma, UW-Madison

**Discovering Wisconsin's bur-reeds: Species diversity, growth form divergence, and habitat specialization**

*Sparganium* is a genus of wetland and aquatic plants, widespread in temperate and cool regions. Eight species occur in Wisconsin, where they are distributed across a broad range of habitats. The species display a striking divergence between two growth forms: floating and emergent. In an ecological and phylogenetic study of the genus, we hypothesized that growth form diverged as species adapted to different aquatic habitats. Results suggest that the floating habit evolved multiple times from emergent ancestors, and that the floating species are specialized in low-nutrient, oligotrophic waters. Because of their specialization in nutrient-poor habitats, several of Wisconsin's bur-reeds may be vulnerable to eutrophication and climate change. Conservation efforts on one Wisconsin lake have preserved rare *Sparganium* within a diverse aquatic plant community, suggesting that even heavily-used lakes can sustain, and benefit from, high quality wetlands.

*Native Wetland Flora, Wednesday, February 19, Ballroom A, 4:40 - 5:00 pm*

**Thobaben, Eric**, Carroll University
Robyn Linner, Hawai'i Pacific University

**Evaluation of treatment cost and floristic quality in plant communities after 8 years of buckthorn removal**

Common buckthorn (*Rhamnus cathartica*) and glossy buckthorn (*R. frangula*) are invasive shrubs that have displaced native vegetation in wetlands across North America. At the Carroll University Greene Field Station, buckthorn has colonized most of the riparian swamp along Genesee Creek. Long-term buckthorn removal plots (10x10 m) were established wherein adults (2006), saplings (2008), and seedlings (2008-2013) were removed over 8 years. Adults and saplings were cut and treated with herbicide, manually removed, or not removed. In 2x2 m subplots nested within the plots, seedlings were treated in spring/fall combinations of four treatments: foliar herbicide, manual removal, precision torching, or no treatment. The material costs and time required to remove the seedlings were recorded to estimate the long-term cost of buckthorn removal. Plant surveys in the experimental subplots and in two reference communities (sedge meadow, wet woods) were conducted every year (2006-2013) to evaluate the ecological quality of the restored plant communities via Floristic Quality Assessment. Assuming wages of $10/hour, the cost of removing buckthorn seedlings over 6 years ranged from $6027-$22,825 per acre. The least expensive spring/fall treatment combinations included spring treatments involving no treatment or foliar herbicide application (mean cost = $10,905), whereas spring treatments involving manual removal or precision torching were more expensive (mean cost = $20,216). There were no differences in mean Floristic Quality Index values across treatments in year 8. Based on these results, we recommend using foliar herbicide application and do not recommend precision torching in the long-term removal of buckthorn seedlings.

*Wetland Invasive Species, Wednesday, February 19, Ballroom A, 11:00 - 11:20 am*

**Tillison, Naomi**, Bad River Natural Resources Department
Jessica Strand, Bad River Natural Resources Department

**Wild rice ecosystem management in the Kakagon/ Bad River Sloughs complex**

The homeland of the Bad River Band of Lake Superior Chippewa Indians (Bad River Tribe or Tribe) centers around the Kakagon/Bad River Sloughs Honest John Lake wetland complex, a place where manomin (wild rice) has grown for centuries. In recent years, the Tribe's rice harvest season has been closed twice in the Kakagon Sloughs. Low water levels, invasion of non-native species, competition with native species, warmer spring water temperatures, changes in water quality, and rapid changes in water levels due to large, early-summer storm events are some of the factors that can affect the productivity of the wild rice beds. The Bad River Tribe implements an integrated resource management approach to protect and enhance the Kakagon/Bad River Sloughs complex, a Wetland of International Importance (or Ramsar Site). Labor-intensive control efforts currently focus on eradicating smaller patches of narrow-leaf and hybrid cattails encroaching on the wild rice beds. In 2013, three different mechanical methods were applied to enhance wild rice productivity in areas dominated by native competitors. Pre- and post-monitoring of the macrophyte community composition will be compared and used in combination with other monitoring data to evaluate the success of each treatment method to improve the wild rice beds.

*Mining Discussion, Thursday, February 20, Ballroom B, 9:30 - 9:50 am*

**Trochlell, Patricia**, WDNR

**Wetland plant communities of the upper midwest**

Wisconsin's diverse wetland plant communities pose challenges for people making wetland determinations and delineations. This presentation will describe wetland plant communities of the upper midwest and typical plant species, soils and hydrology with examples of wetland indicators. Atypical plant communities and suggestions on determining wetland boundaries will also be addressed.

*Wetland Delineation, Wednesday, February 19, Ballroom C, 4:20 - 4:40 pm*

**Waupochick, Angela**, Stockbridge-Munsee Community
Kevin J. Stark, St. Mary's University
Jensen D. Connor, St. Mary's University

**A landscape-scale wetland functional assessment and identification of potential wetland restorations sites for the Stockbridge-Munsee Community**

In 2011, the United States Environmental Protection Agency awarded the Stockbridge-Munsee Community a Wetland Program Development Grant to develop a Geographic Information System Wetland Restoration Database, which was completed with St. Mary's University. The database was built with information derived from topographic, wetland inventory, and soil datasets along with orthophotography dating back to 1938. 179 potential restoration sites were identified. From 1938 till 2005, approximately 224 acres of wetland were re-occupied by beavers, 227 acres were farmed or drained, 776 acres were impacted by impoundment, and 274 acres were excavated. This project was done in collaboration with The Nature Conservancy who served as contributors and provided direction and guidance to our project through Duck-Pensaukee Watershed Approach.

*Wetland Restoration I, Thursday, February 20, Ballroom A, 9:30 - 9:50 am*

**Winter, Stephen**, USFWS Upper Mississippi River National Wildlife and Fish Refuge
Dan Salas, Cardno JFNew
Mark Prankus, Cardno JFNew

**Habitat management planning at the Upper Mississippi River NW&FR: Protecting wetland communities and species**

Conservation planning is the first step toward efficient ecosystem management and restoration. Understanding the landscape context of a site should help drive management priorities. The USFWS policy on habitat management planning requires all national wildlife refuges to complete a planning process to identify management priorities in light of Federal trust needs, legislatively-defined purposes of the Refuge, landscape context, and natural resources found across the Refuge. Over the past year, the Upper Mississippi River National Wildlife and Fish Refuge has been working with State and Federal partners to identify fish and wildlife habitat needs that the Refuge can address through management. This presentation will discuss the efforts completed to date by the USFWS, supported by the ecological consulting firm Cardno JFNew, and working with state and federal partners to identify the Refuge's context in light of the landscape and other river planning efforts. Together, we also prioritized resources of management concern and associated habitats across the Refuge and its management districts. In this presentation, we will highlight data utilized, decisions made by Service staff, and contributions made by partner agencies and organizations. We will also provide insight on potential management objectives and implementation recommendations. Information shared will help inform other land managers about resource planning and prioritization, while updating interested wetland professionals on our progress.

*Upper Mississippi River Wetlands, Thursday, February 20, Ballroom C, 9:30 - 9:50 am*

**Winter, Stephen**, USFWS, Upper Mississippi River National Wildlife and Fish Refuge
Brian Stemper, USFWS
Ruth Nissen, WDNR

**Shorebird and waterfowl response to pool-scale drawdowns: Information available vs information needed**

The Upper Mississippi River has been designated a Wetland of International Importance provides critical habitat for migrating waterbirds in the Mississippi Flyway. Summer drawdowns were conducted on selected Pools of the Upper Mississippi River in an attempt to increase the amount of wetland vegetation, both annual wetland plants that typically colonize mudflats (commonly referred to as moist-soil plants) and perennial species characteristic of emergent, floating-leaved, and submersed aquatic plant communities. Shorebirds and waterfowl are two guilds of wildlife that could potentially respond to the short- and longer-term effects of a drawdown. Shorebirds would be expected to utilize the exposed substrates that are present while water levels are low during the period a drawdown occurred. If a drawdown results in an abundance of moist-soil vegetation, dabbling ducks, which commonly feed on seeds in shallow waters, would be expected to respond to a drawdown in the seasons immediately following a drawdown. Finally, any response of perennial wetland vegetation might be followed by a response of swans and many species of diving ducks, all of which commonly feed on the winter buds and tubers of various perennial species of aquatic plants. This response to perennial vegetation might be expected to last several years. This presentation will highlight monitoring data that may be useful in determining if pool-scale drawdowns on the Upper Mississippi River benefit shorebirds and waterfowl. Weekly aerial waterfowl surveys during the fall have been conducted by a multi-agency partnership on the Upper Mississippi River during years prior to, during, and following all drawdowns that have occurred.

*Pool-scale drawdowns in UMR, Wednesday, February 19, Ballroom B, 2:50 - 3:10 pm*

**Woods, Brock**, UWEX, WDNR
Stacy Schumacher, WDNR

**Strategizing for control of non-native *Phragmites australis* in Wisconsin**

Non-native *Phragmites australis* is advancing west into Wisconsin since invading Great Lakes shores in the 1980s. It is starting to dominate interior wetlands and shorelines where it greatly reduces native biodiversity. Many small pioneer populations have gotten into the middle of the state, but only a few scattered infestations are known in most western counties. The WDNR/ UWEX Wetland Invasive Species Team hopes to stop its spread to many interior lakes and wetlands by eliminating as many advancing pioneer populations as possible, and all of those known in the western counties. Its plan also targets small infestations threatening high priority wetlands. WDNR has received a USFWS (GLRI) *Phragmites* control grant for $200,000 to initiate this strategy by eliminating pioneer populations within western Lake Michigan basin counties where many leading edge infestations exist. Simultaneously, early detection/rapid response grants are available to suppress all scattered stands in the western counties. As part of the GLRI project, an ongoing mapping effort is underway with all partners who may have, or can collect, non-native *Phragmites* location data to build an accurate map of its populations across the state. A site selection protocol has been developed, and the goal is to treat at least 200 acres of non-native *Phragmites*. Control will start in 4 northern Lake Michigan basin counties and continue into counties south and east along the western boundary of the basin. Treatments are to start in the summer of 2014 with follow up through fall 2015. Future efforts will focus on monitoring and additional control as funds allow. Come to comment on this strategy, learn how to participate, or contact the presenters to learn more. All possible partners are needed to ensure success!

*Poster Session, Wednesday, February 19, La Crosse Center Ballroom Foyer, 5:00 - 6:30 pm*

**Yin, Yao**, USGS, Upper Midwest Environmental Sciences Center

**Detecting the lasting effects of water level drawdown on aquatic vegetation in Upper Mississippi River Pool 8**

A series of locks and dams were constructed in the 1930s in the upper Mississippi River to sustain a 9-ft channel for waterway transportation. Drawing down the surface water level to promote aquatic vegetation was conducted in Pool 8 during the summers of 2001 and 2002. Aquatic vegetation data collected annually under the Upper Mississippi River Restoration – Environmental Management Program were analyzed to detect the lasting effects of the experiment. The data revealed varied durations of increased frequency of occurrence attributable to the drawdown for several species, including 1 year for *Leersia oryzoides* (L.) Sw.; 6 years for *Schoenoplectus tabernaemontani* (K.C. Gmel.) Palla; and more than 7 years for *Sagittaria rigida* Pursh. and *S. latifolia* Willd. The information is useful for scheduling future water level drawdowns to sustain healthy aquatic vegetation in the upper Mississippi River.

*Pool-scale drawdowns in UMR, Wednesday, February 19, Ballroom B, 2:30 - 2:50 pm*

**Key to Common Agency Abbreviations Used in Abstracts and Bios**

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| USACE | U.S. Army Corps of Engineers |
| USDA | U.S. Department of Agriculture |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| UW | University of Wisconsin |
| WDNR | Wisconsin Department of Natural Resources |
| WGNHS | Wisconsin Geological and Natural History Survey |
| WisDOT | Wisconsin Department of Transportation |

# PRESENTER BIOGRAPHIES

**Don Barrette** (don.barrette@swbadger.org) grew up fishing, exploring the outdoors and developing his interest in the natural sciences in his native Mineral Point. He earned his bachelor's degree in zoology in 2005 and his master's degree in zoology in 2008, both from the UW-Madison. Before joining Southwest Badger RC&D, Barrette was a fish technician and a fish health specialist/microbiologist with the WDNR. Don currently works for Suthwest Badger RC & D as their AIS coordinator in the driftless area region of Wisconsin.

**David Bart** (dbart@wisc.edu) is an Assistant Professor in the Department of Landscape Architecture, Gaylord Nelson Institute, and Agroecology programs at UW-Madison. His current research focuses on the role of land-use legacies in determining invasion resistance in high quality wetlands, as well as how past land use impacts wetland restoration.

**Karen Bednar** (b.karenelaine@gmail.com) is an M.S. candidate in Water Resources Management (WRM) in the Nelson Institute for Environmental Studies at the UW-Madison. Her focus is on the intersection between natural resource management and environmental health, specifically water quality and ecological restoration to enhance it.

**Gretchen Benjamin** (gbenjamin@tnc.org) is the Associate Director for Water Resources Infrastructure with The Nature Conservancy. She has worked on the Mississippi River for almost 30 years for the WI DNR and TNC. She is working on a blueprint for ecological restoration in the Lower Mississippi River and reoperating dams and modifying channel structures for the environment on the UMR. She has a B.S. from the University of MT.

**Tom Bernthal** (thomas.bernthal@wisconsin.gov) is the Wetland Assessment and Monitoring Coordinator for the WDNR. He has an MS in Water Resources Management from the UW-Madison. He works on assessmnet projects at a variety of scales with a variety of partners, from GIS and remote-sensing based studies covering major river basins to intensive assessments of small wetlands.

**Tom Boos** (Thomas.boos@wi.gov) has been with the WDNR for 14 years and is currently in the Forestry Division as the Invasive Plant Coordinator. He started with the State Natural Areas crew and has much experience in waterway and utility permitting. He obtained a B.S. in Landscape Architecture from UW-Madison. Tom is an active volunteer with the Invasive Plants Association of Wisconsin, the Prairie Enthusiasts, and enjoys his family, gardening, and his two mutt dogs.

**Michael Bourdaghs** (michael.bourdaghs@state.mn.us) (pronounced 'Bird-ash') has been with the Minnesota Pollution Control Agency since 2004 working on developing and implementing wetland monitoring and assessment techniques.

**Amanda Budyak** (ajbudyak@uwalumni.com) graduated from UW-Madison in May of 2008 with a BS in Forestry and Recreation Resource Management. After graduation she obtained a position as a Madison Audubon Summer intern. She is currently the land manager at Pleasant Valley Conservancy and works as a restoration ecologist for Integrated Restorations, LLC.

**Gary Casper** (gscasper@uwm.edu) is an Associate Scientist at the UWM Field Station, owner of Great Lakes Ecological Services, and editor for two peer reviewed journals. He recently founded Wisconsin Partners in Amphibian and Reptile Conservation and spent his early career at the Milwaukee Public Museum. His research focuses on wildlife conservation, inventory and monitoring in the Upper Midwest and Canada.

**James Church** (churchjam@uwstout.edu) is a lecturer in the Biology Department at UW - Stout. He received his PhD in Ecology and Evolutionary Biology from Iowa State University in 2011.

**Jessie Conaway** (dconaway@wisc.edu) is an outdoor educator, and has designed watershed education programs on the Upper Mississippi River, the Bad River watershed, and the Sugar River. She is currently working with the Bad River Ojibwe in community-based research on water stewardship. Conaway holds a master's degree in experiential education, and is currently a candidate for a doctorate in Environment and Resources at UW-Madison.

**Tom Custer** (tcuster@usgs.gov) is a research wildlife biologist with the U.S. Geological Survey. He received a PhD in Zoology from the University of California, Berkeley. He has over 30 years of experience working on the effects of contaminants on wildlife, mainly birds.

**Nicholas Danz** (ndanz@uwsuper.edu) teaches plant biology at UW-Superior and researches Great Lakes coastal ecosystems, including dunes, wetlands, and forests. He encourages you to visit the magnificent wetlands of the St. Louis River estuary and to check out UW-Superior along the way.

# PRESENTER BIOGRAPHIES

**Tara Davenport** (tedavenport@wisc.edu) received a B.S. in Biology from Linfield College (OR) and M.S. in Biology from California State Polytechnic University, Pomona. She is currently working on her PhD in Environmental Studies at UW-Madison and will finish this spring. Tara is interested in wetland restoration and the relationship between human impacts and current wetland vegetation.

**Steve Eggers** (steve.d.eggers@usace.army.mil) is a Senior Ecologist and Professional Wetland Scientist with the U.S. Army Corps of Engineers, St. Paul District. He is a co-author of "Wetland Plants and Plant Communities of MN and WI" now in its third edition. Steve is a member of the National Advisory Team for Wetland Delineation as well as the National Technical Committee for Wetland Vegetation.

**Jason Fleener** (jason.fleener@wisconsin.gov) received a bachelors degree for UW-Stevens Point in 2005, with majors in Wildlife Management and Biology, and minors in Water Resource Management and Soil Science. An eight year employee of Wisconsin DNR, Jason currently works in the Wetland Habitat Program and has managed the State Waterfowl Stamp Program since 2012.

**Timothy Flood** (flootj03@uwgb.edu) is currently a graduate student studying environmental science at UW-Green Bay, expecting to graduate in Spring 2014. Tim graduated from UW-Parkside in Spring 2011 with a BA in Geography, including a concentration in Applied Environmental Geography and a certificate in Geographic Information Systems.

**Richard Frost** (Frosty_sci@centurytel.net) is a retired history teacher, having taught in the school district of La Crosse for thirty years. He received his Master's Degree in Education at UW-La Crosse in 1983. He is also a volunteer naturalist at the Myrick-Hixon EcoPark, La Crosse's premier nature center which serves 6000 students each year. He conducts many nature programs for students and adults.

**Pamela Gehant** (gehantp0108@my.uwstout.edu) is an undergraduate student at UW-Stout studying Applied Science with a concentration in Biotechnology and Pre-Veterinary studies. Her future plans are to apply to veterinary school and pursue a career in the veterinary field.

**Brian Glenzinski** (bglenzinski@ducks.org) came to Ducks Unlimited in October of 2012 filling a newly created, Wisconsin focused, Regional Biologist position. He is responsible for all conservation programs in Wisconsin, including wetland restoration and associated upland habitat delivery, land and easement acquisition and technical assistance. Mr. Glenzinski has worked extensively on ecological restoration throughout WI.

**Tony Havranek** (havranek.stcroix@gmail.com) received a B.S. in Broad Area Agriculture-Natural Resources Conservation emphasis from UW-River Falls in 2001. Since that time Tony has served the St. Croix Chippewa in a variety of positions including Wild Rice Intern, Fish and Wildlife Technician/GIS Specialist, and currently; Land and Water Resources Manager.

**Richard Henderson** (richard.henderson@wisconsin.gov) received B.S. and M.S. degrees in conservation from UW-Madison. From 1983 to present he has been a research ecologist with the WDNR Bureau of Science Services. He has 36 years of experience in natural area inventory, assessment, and management, and is an active volunteer with The Prairie Enthusiasts land management program since 1992.

**Tod Highsmith** (todhighsmith@me.com) is a member of the Board of Directors of the Wisconsin Wetlands Association and a retired writer and editor in the conservation sciences. He has a PhD in Zoology from the University of Massachusetts at Amherst (1989), where he studied the singing behavior of wood-warblers.

**Paul Hlina** (phlina4@gmail.com) is the lead Principal Investigator for the Lake Superior Basin Floristic Quality Assessment Project Northwest, Wisconsin. Paul has conducted vegetative studies for Lake Superior Coastal wetlands, State Natural Areas and State Parks with the Lake Superior Research Institute (LSRI) since 2006. Paul operates a private greenhouse business that supplies plants for restoration projects.

**Rachel Huerth** (huerth.rach@uwlax.edu) is a Chemistry major at UW-La Crosse. She will graduate with an ACS-certified degree in December 2014. Her main areas of research interest include environmental chemistry with a focus on the interface between terrestrial and aquatic ecosystems. In 2013 she was awarded a research fellowship with the National Great Rivers Research & Education Center.

# PRESENTER BIOGRAPHIES

**Emily Hutchins** (emily.hutchins@state.mn.us) received a B.S. in Wildlife Management from the U of MN, Crookston and a M.S. in Biology from MN State Univ, Mankato. Her graduate research was on the effects of invasion by reed canarygrass on avian communities and nesting success in MN wetlands. She has been employed with the MN DNR since 2002 as a private lands wildlife biologist and is on the wetland wildlife habitat team.

**Dan Jackson** (danjackson@lbwhite.com) is an citizen monitor who has participated in many bird, frog, butterfly, and odonata monitoring projects in Wisconsin, Minnesota, and North Dakota. He has been an active participant in the Wisconsin Odonata Survey for the last 5 flight seasons and has contributed over 5000 sighting records to the project during that time period.

**Tony Janisch** (janisch@badriverwatershed.org) is the Executive Director of the Bad River Watershed Association. Tony has a BS in Natural Resource Management from UW-Stevens Point, and an MS in Recreation Administration from Aurora University. His past work experience includes: Executive Director for the Whitefish Point Bird Observatory, Supervisor for Environmental Education for the Will County Forest Preserve District, and renewable energy instructor for the Midwest Renewable Energy Association.

**Judith Joyce** (judy@earthviewenvironmental.com) (PWS) is a geologist and the owner of EarthView Environmental, Inc. She has over 20 years of experience in wetland and in soil classification and morphology. This work entails soil characterization, plant identification, and hydrological studies with major emphasis in soil interpretations for land use.

**Mike Kennedy** (mkennedy@bird-song.com) has been involved in many Mississippi River groups, starting with Citizens for A Clean Mississippi (1970's) and is currently a citizen member of the Water Level Management Task Force. A long term Izaak Walton League member and lifelong volunteer for the USFWS has provided a significant education about wildlife refuges and habitat. Mike and his family enjoy a rustic cabin in UMR Pool 5 often.

**Kevin Kenow** (kkenow@usgs.gov) received a B.S. in Wildlife Biology from the Univesity of Minnesota and a M.S. in Wildlife Ecology from the University of Wisconsin. He is a Research Wildlife Biologist at the Upper Midwest Environmental Sciences Center, La Crosse, WI. His research relates to conserving migratory birds and their habitats in the midwest and development of common loon conservation strategies.

**Shelby Kilibarda** (kilibardas@my.uwstout.edu) is an undergraduate student at UW-Stout. She will graduate in May 2014 with a degree in environmental science and minors in chemistry and geographic information system (GIS). She hopes to get a job with the DNR and eventually get a master's degree in marine biology.

**Eileen Kirsch** (ekirsch@usgs.gov) received her Ph.D. in Zoology from University of Montana in 1991, and her MA and BS degrees in Biology from University of Nebraska - Omaha in 1986 an 1984, respectively. She has been working the Upper Mississippi River since 1991 on a wide range of studies involving breeding and migrating birds.

**Mary Linton** (snappinglinton@gmail.com) is a wetland ecologist and owner of Snapping Linton Ecology. Mary's co-authors are Mike Mossman and Alice Thompson. Mike Mossman is a Research Scientist for the WDNR. Alice Thompson is a wetland ecologist and owner of Thompson and Associates Wetland Services, LLC.

**Amanda Little** (littlea@uwstout.edu) is in her sixth year at UW-Stout teaching in the new Environmental Science major. She received her PhD in Botany from UW-Madison, and her BS in natural resources from UW-Stevens Point. Little is currently working on a five-year project studying ephemeral pond metacommunities, and also serves on the Board of Directors for the Natural Areas Association.

**Lynn Markham** (lmarkham@uwsp.edu) is a Land Use Specialist with the Center for Land Use Education at UW-Stevens Point. She helps Wisconsin communities who want to protect drinking water, lakes and streams by providing research-based information, examples from other communities and policy options.

**Michele Martzke** (michele.martzke@cbi.com) is the coordinator of Natural Resources consulting for CB&I in St. Charles, Illinois. She graduated from Calvin College with a degree in Environmental Science. Ms. Martzke has over 6 years of experience in environmental consulting in the Midwest. Ms. Martzke coordinates permitting and natural resources surveys for a variety of commercial, industrial and railroad improvements projects.

# PRESENTER BIOGRAPHIES

**Jeffrey Matthews** (jmatthew@illinois.edu) is an Assistant Professor in the Department of Natural Resources and Environmental Sciences at the University of Illinois. Dr. Matthews is a plant ecologist specializing in the restoration and ecology of freshwater wetlands.

**Brett McConnel** (brettmc@centurytel.net) has worked for the Lac Courte Oreilles Tribe for 15 years. He currently manages the Tribe's Clean Water Act Section 106 Program and administer numerous agency projects/grants. Brett also serves as the Wisconsin Tribal Conservation Advisory Council (WTCAC) Treasurer. Brett holds a B.S. in Natural Resources Management from UW-Stevens Point, is married with 4 children, and resides in Hayward, WI.

**Susan McIntyre** (sdmcinty@illinois.edu) joined the Wetlands Program at the Illinois Natural History Survey in 2012. She holds a masters degree in Natural Resources from North Carolina State University and has conducted field work all around the country, from North Carolina to Alaska. Her primary research and education focus is restoration of ecosystem services in human-altered landscapes.

**Nick Miller** (nmiller@tnc.org) integrates science into conservation policy, strategies, and tools as the science director for The Nature Conservancy in Wisconsin. His recent wetland projects include creating watershed plans that link site prioritization to watershed needs (wildlife habitat, water quality, flood abatement) and contributing to the development of a national Watershed Approach Handbook for wetland mitigation.

**Thomas Nedland** (thomas.nedland@wisconsin.gov) is the Wetland Identification Coordinator with WDNR. He is a PWS with a background in wetland ecology and field biology . Tom's primary responsibilities include reviewing wetland delineation reports, conductng wetland determinations, providing internal and external training opportunities on wetland delineation protocols, and helping administer DNR's Assured Delineator program.

**Teresa Newton** (tnewton@usgs.gov) focuses her research interests on the conservation and ecology of freshwater mussels, a group of animals in which 70% of the species are in jeopardy. Teresa uses a combination of comparative and experimental approaches to understand the effects of habitat manipulation on native mussel assemblages in large rivers.

**Julie Nieset** (jenieset@illinois.edu) started her wetland career as a Student Conservation Association intern studying prairie pothole wetlands with USGS Northern Wildlife Prairie Research Center. From there she earned her MS in Biology, and has worked environmental consulting. She is a Wetland Plant Ecologist with the Illinois Natural History Survey. Check us out at http://wwx.inhs.illinois.edu/research/wetlands /

**Ryan O'Connor** (ryan.oconnor@wisconsin.gov) is an ecologist and inventory coordinator with the Wisconsin Natural Heritage Inventory in the WDNR, which provides land managers with high-quality data on natural communities and rare and declining species. Ryan has a Masters Degree from the University of Michigan and has worked as a botanist and ecologist in Wisconsin and Michigan for 10 years.

**Geof Parish** (geoffrey.parish@graef-usa.com) is a hydrologist and geologist at GRAEF, in Milwaukee, Wisconsin. He has studied wetland hydrology in Wisconsin for almost twenty years. He has worked on habitat preservation and enhancement projects. His wetland work participation has included wetland delineations, wetland mitigation projects, including enhancements, restorations and creations in Wisconsin and Illinois.

**Heather Patti** (heather.patti@rasmithnational.com) (PWS) received a Masters in Botany from North Carolina State University and a Bachelors in Biology and Chemistry from UNC-Wilmington. She moved to Wisconsin in 2000 and began a career in wetland and environmental consulting. She now works at RA Smith National, a civil engineering firm in Brookfield, Wisconsin as the lead Ecologist Wetland Scientist.

**Kenneth Powell** (ken.powell@state.mn.us) has been Minnesota's wetland banking coordinator for the past year and a half. Prior to that he was a senior wetland specialist with the State, a wetland specialist with a local watershed district, an environmental consultant, and a biologist with the USFWS. Ken has a B.S. in wildlife from the UW-Stevens Point and an M.S. in biology from Kansas State University.

# PRESENTER BIOGRAPHIES

**William Richardson** (wrichardson@usgs.gov) received his Ph.D. in Zoology from the University of Oklahoma, MS in Aquatic Ecology at Central Michigan University, and BS at Michigan State University in Fishery Biology. A 2 year post -doc stint at the University of Georgia's Savannah River Ecology Lab led Richardson to a position with the USFWS research lab in La Crosse – which eventually transformed to the US Geological Survey's Upper Midwest Environmental Sciences Center.

**Joseph Roth** (jroth@openlands.org) is the Restoration Program Manager for Openlands, a private not for profit conservation organization based in northeastern Illinois. Mr. Roth has over 20 years experience in conservation, specifically with land acquisition, conservation easements, conservation planning, and wetland/natural area restoration. Mr. Roth is also a consultant for Illinois Nature Preserves Commission.

**Nick Rudolph** (Rudolphnd30@uww.edu) is from Green Bay and is studying biology with a field ecology emphasis at UW-Whitewater. In the summer of 2013 he was involved with using radio telemetry to track Blanding's turtles and in the winter of 2013 used winter tracking techniques to compare wolf and coyote densities. He plans to continue this study in the winter of 2014.

**Dan Salas** (dan.salas@cardno.com) has been working in the field of ecological restoration for over sixteen years. His experience includes invasive plant management, restoration and conservation planning, and the planning and implementation of stream, forest, and wetland restoration projects. He is also a Certified Senior Ecologist through the Ecological Society of America.

**Tim Schlagenhaft** (tschlagenhaft@audubon.org) received a BS from UW-Stevens Point and MS from Texas Tech University. He is currently employed as Conservation Coordinator for Audubon Minnesota, and previously worked for the MN DNR where he served as Area Fisheries Supervisor and Mississippi River Habitat Coordinator. Tim has been involved in Pool drawdowns on the Mississippi River since 1996.

**Stacy Schumacher** (stacy.schumacher@wi.gov) completed her MS in Edinburgh in Environmental Sustainability in 2003 and worked in the United Kingdom as a ranger for the city of Edinburgh before returning to WI in 2012. She has worked for Door County Soil and Water as well as the WDNR on invasive species issues, particularly relating to *Phragmites australis* spp. *australis*.

**Dan Shaw** (Dan.Shaw@state.mn.us) is a Vegetation Specialist and Landscape Ecologist with the Minnesota Board of Water and Soil Resources. His work focuses on conservation, restoration, landscape resiliency, and invasive species control. He is author of several publications on stormwater and wetland design. He is also an Adjunct Assistant Professor at the University of Minnesota.

**Patrick Siwula** (siwula.patr@uwlax.edu) has been working in Dr. Anita Baine's lab at UW-La Crosse since June of 2012. He has received an undergraduate research grant as well as a Dean's Distinguished Fellowship to conduct research over the past summer. Patrick presented a poster of his findings at the Ecological Society of America annual conference held this past August in Minneapolis, Minnesota.

**Paul Skawinski** (Paul.Skawinski@goldensandsrcd.org) is a Regional Aquatic Invasive Species (AIS) Education Specialist for Golden Sands Resource Conservation & Development Council, Inc., in Stevens Point, Wisconsin. He monitors for AIS throughout five counties, and trains volunteer groups to identify and remove AIS from their lakes. Paul is also the author of the popular field guide Aquatic Plants of the Upper Midwest.

**Jennifer Slate** (J-Slate@neiu.edu) is a Professor at Northeastern Illinois University, where she teaches General Biology and Ecology as well as electives in Phycology, Quaternary Ecology, and Species Diversity. Her research focuses on using diatoms as bioindicators in paleolimnological studies. She has done research in a variety of wetlands, including the Florida Everglades and Virginia's Great Dismal Swamp.

**Amanda Smith** (smitha7503@my.uwstout.edu) is an undergraduate in the Environmental Science program at UW-Stout. In 2013, she worked under the supervision of Amanda Little and Jim Church as a wetland research technician for a five year study funded by the National Science Foundation. Amanda plans on pursuing graduate school to study limnology, fisheries, or arctic ecosystems.

**Tim Smith** (Tim.J.Smith@usace.army.mil) is currently serving as the Chief of the Technical Services Section for the U.S. Army Corps of Engineers, St. Paul District Regulatory Branch. He manages the District's internal subject matter experts and coordinates support to other District staff on a variety of issues including Clean Water Act jurisdictional determinations and enforcement actions. Mr. Smith received a Masters Degree in Environmental Science from Indiana University and a Bachelors Degree in Environmental Science from the University of Evansville.

**Carol Strojny** (carol.strojny@state.mn.us) has an undergraduate degree in Wildlife from UW-Stevens Point, and a graduate degree in Wildlife Ecology from the University of Maine. She has monitored hundreds of restored wetlands of all shapes, sizes, and ages. Most recently her focus is on the establishment of wetland mitigation banks, from planning to final delineations.

**Kaycie Stushek** (Kaycie.Stushek@goldensandsrcd.org) is the Aquatic Invasive Species Outreach Specialist at Golden Sands Resource Conservation & Development Council, Inc., and covers five counties in Central Wisconsin. She enjoys educating youth and adults about the value of aquatic environments, and how to prevent the spread of invasive species. She received her Bachelor's degree from UW-Stevens Point's College of Natural Resources.

**Joshua Sulman** (jdsulman@gmail.com) grew up absorbing botany in the woods and prairies around Madison, WI. He earned a Bachelor's and Master's in Botany at UW-Madison, where he studied ecology, floristics and plant systematics. He has worked at a zoo, driving cab, collecting plants on the public lands of Nevada, climbing trees for an arborist, doing ecological restoration, and conducting botanical surveys.

**Eric Thobaben** (ethobabe@carrollu.edu) earned his Ph.D. from Michigan State University. As a wetland plant ecologist, he studies buckthorn removal techniques to aid land managers in decision making and to test community assembly theory as a restoration ecologist.

**Naomi Tillison** (wqs@badriver-nsn.gov) is the Water Resources Specialist with the Bad River Natural Resources Department. After graduating in 2002 with a B.S. in Environmental Engineering from Michigan Technological University, Naomi worked as an environmental consultant, primarily focusing on the design, operation, and analysis of groundwater and soil remediation systems. In 2005, she graduated from Michigan Tech with a M.S. in Environmental Engineering and a Certificate of Sustainability. Naomi started working with the Bad River Band of Lake Superior Tribe of Chippewa Indians in 2007 and has been managing their Water Resources Program since 2008.

**Patricia Trochlell** (patricia.trochlell@wisconsin.gov) is a wetland ecologist with the WDNR working on wetland issues including wetland identification and delineation, training, assessment, invasive species, monitoring, mitigation and restoration issues. Her background is in wildlife biology, soil science and wetland ecology.

**Angela Waupochick** (angela.waupochick@mohican-nsn.gov) is the Wetland Specialist for the Stockbridge-Munsee Community Band of Mohican Indians located in Bowler, Wisconsin. Her focus is wetland restoration projects on the reservation and the subwatersheds associated with the Tribe. Prior to her current position, Angela was employed with the Bureau of Indian Affairs and Forest Service working in Fire and Fuel Management in the southwest. She has served with the Navajo Hotshots, Ute Mountain Ute Helitak, and with other engine crews.

**Stephen Winter** (stephen_winter@fws.gov) is the senior wildlife biologist for a refuge encompassing over 240,000 acres along 261 miles of the Mississippi River. He is a relative newcomer to the area, having spent most of his life in the Great Plains. His background and experience are in the areas of fire and grazing ecology in grasslands but he enjoys his new job which has him immersed, so to speak, in big river ecology.

**Brock Woods** (brock.woods@wisconsin.gov) is part of the UW Extension's AIS Team, and has been the manager of Wisconsin's Purple Loosestrife Biocontrol Program for over 15 years. In recent years he has joined with other wetlanders at WDNR to broaden the scope of the agency's wetland invasive species control efforts. His undergraduate degree is from Lawrence University and he has a MS in Plant Ecology from UW-Madison.

**Yao Yin** (yyin@usgs.gov) received his Ph.D. in Botany from the University of Tennessee and worked for the Missouri Department of Conservation before he came to Wisconsin in 1994. Since then he has been studying terrestrial and aquatic vegetation in the Upper Mississippi River System. Dr. Yin has been an Ecologist of USGS since 2000.

# INDEX OF AUTHORS

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