Urban Wetlands

Wisconsin Wetlands Association's 17th Annual Conference

Abstracts

& Presenter Biographies

Wisconsin Wetlands Association

February 22-23, 2012
Lake Geneva, Wisconsin

www.wisconsinwetlands.org

WEDNESDAY, February 22, 9:00 am - 9:00 pm

9:00 - 10:10 Plenary Session (Grand Ballroom)

9:00 **Welcome & Opening comments**

9:20 **Plenary Session: *The Economic Value of Urban Wetlands: Revealing our Best Investments***
David Batker, Chief Economist and Executive Director at Earth Economics

10:10 - 10:40 Break (Grand Ballroom)

10:40 - 12:00 Concurrent Sessions

	Maple Lawn C **Wetland Restoration Techniques** *Moderator: Art Kitchen*		Maple Lawn B **Management Planning for Wetlands** *Moderator: Nick Miller*		Maple Lawn A **Working Group: Economics & Ecosystem Services** *Moderator: Lynn Broaddus*
10:40	**Matthews**	Obstacles to defining and achieving success in compensatory wetland mitigation	**Salas**	Habitat management planning with the USFWS along large riverine systems of the Midwest	An exploration and discussion of opportunities to better measure, understand, and promote the economic value of wetlands with keynote speaker David Batker.
11:00	**Jensen, Jesse**	Factors affecting degradation and recovery of aquatic ecological integrity in urbanizing watersheds (Pike River III)	**Rossler**	Status of Wisconsin's Beaver Management Plan	
11:20	**Melchior**	Eel River: A model for the restoration of retired cranberry bogs	**Glenzinski**	Big Muskego Lake: Preventing the forward switch	
11:40	**Thompson, M.**	The Walk Away System: A multi-benefit planting regime for wetland sites	**Thompson, A.**	Design features and adaptive management for restoring structure and function in an urban floodplain (Pike River II)	

12:00 - 1:00 Lunch (provided - Grand Ballroom)

1:00 - 2:40 Concurrent Sessions

	Maple Lawn C **Strategies for Prioritizing Restoration** *Moderator: Eric Parker*		Maple Lawn B **Approaches to Wetland Mapping and Assessment** *Moderator: Dreux Watermolen*		Maple Lawn A **History as a Factor in Wetland Restoration** *Moderator: Joy Wolf*
1:00	**Parker**	Recognizing and understanding natural area remnants in urban wetland systems	**Bernthal**	Sorting out wetland change: What's really happening to wetlands on the landscape?	**Wolf**	Ephemeral pond diversity across varying basin attributes and land ownership
1:20	**Miller, N.**	Thinking like a watershed: A framework to align wetland mitigation actions and watershed conservation priorities	**Griffin**	Characterization and analysis of wetland restoration sites in Wisconsin	**Bart**	Land-use legacies and fen recovery after intensive agriculture
1:40	**Brown**	Using a GIS model to systematically prioritize potential wetland mitigation banks in Wisconsin	**Powell**	On the edge: Assessing vegetation for wetland delineation purposes in diverse urban wetlands in Minnesota	**Johnson**	Contrasting changes in urban and rural floodplain forests: A 55-year view from the understory
2:00	**Smith, C.**	Potentially Restorable Wetlands Version 2.1: A revised methodology for finding potentially restorable wetlands	**Chappelle**	Ephemeral pond identification using remote sensing techniques in southeastern Wisconsin's varied landscape	**McLeester**	Valuing wetlands: An archaeological perspective on the past and present use of wetlands
2:20	**Wernerehl**	EPA's National Wetland Condition Assessment in Wisconsin	**Martin**	Wetland forests in Wisconsin: Trends and restoration possibilities	**Scherer**	Marine diatoms in upper Midwest wetlands? Yes, it's true!

2:40- 3:10 Break (Grand Ballroom)

3:10-4:50 Concurrent Sessions

	Maple Lawn C **Wetland Invasive Plants** *Moderator: Kelly Kearns*		Maple Lawn B **Involving the Human Community** *Moderator: Travis Olson*		Maple Lawn A **Working Group: Mining Wisconsin's Penokee** *Moderator: Erin O'Brien*
3:10	**Little**	Riparian soil, reed canarygrass (*Phalaris arundinacea*), and plant species richness in trout stream restorations	**Ehlinger**	Human-environmental history and establishing a framework for ecological restoration in an urbanizing watershed (Pike River I)	A panel presentation and group discussion of mining in Wisconsin's Penokee Range.
3:30	**Link**	Non-native *Phragmites australis* may spread via cut stem fragments	**Simpson**	A weekend of restoration: Restoring a wetland and building community	
3:50	**Geddes**	Effects of native and non-native strains of *Phragmites australis* on freshwater wetlands	**Grunert**	Restoring an urban wetland: Lessons on strategy	
4:10	**Springborn**	A multi-partnered, landscape level approach to *Phragmites* control along Lake Michigan shores	**Schwartz**	Bird City Wisconsin: 39 communities win recognition for protecting urban wetlands and their inhabitants	
4:30	**Zacharias**	Economic and ecological trade-offs over six years of a long-term buckthorn removal experiment	**Joyce-Krieg**	Integrating natural areas into your community: Using mitigation for "out of the box" funding	

5:00 - 6:30 Poster Session & Cash Bar (Grand Ballroom & Ballroom Foyer)

6:30 - 9:00 Banquet & Presentation by Tracy Hames, Wisconsin Wetlands Association's new Executive Director (Ticketed event - Grand Ballroom). This event is sponsored by Ho-Chunk Nation

THURSDAY, February 23, 8:30 am - 5:00 pm

8:30-9:20 Plenary Session (Maple Lawn C)

8:30 **Welcome**

8:40 **Plenary Address for the Special Session: Biologist Without Borders: *Beyond Here There Be Dragons***
Ed Collins, Natural Resource Manager, McHenry County Conservation District (IL). This Special Session is sponsored by Chicago Wilderness

9:30 - 10:30 Concurrent Sessions

	Maple Lawn C	Biologist Without Borders - Ideas and Plans *Moderator: Jim Anderson*	Maple Lawn B	Habitat Needs for Wetland Wildlife 1 *Moderator: Josh Kapfer*	Maple Lawn A	Stormwater Management and Wetlands *Moderator: Vince Mosca*
9:30	**Anderson**	Biologists Across Borders: An overview of Chicago Wilderness	**Rossler**	Status of beaver in Wisconsin	**Prellwitz**	Soil stability and water quality within wetland treatment swales for urban runoff
9:50	**Mengler**	The Chicago Wilderness Green Infrastructure Vision	**Glisson**	Determining habitat requirements and restoration targets for secretive marshbirds	**Doherty**	Urban stormwater appears to increase productivity and decrease diversity in natural and engineered wetlands
10:10	**Rogner**	Millennium Reserve Calumet: Reinvesting in the ecology, culture and economy of the Calumet Region	**Sloss**	Genetic integrity and hybridization of Wisconsin gartersnakes	**Somers**	Permeable paver systems: Sustainable storm water management with permeable paving units

10:30 - 11:00 Break (Grand Ballroom)

11:00 - 12:00 Concurrent Sessions

	Maple Lawn C	Biologist Without Borders in Action *Moderator: Jim Anderson*	Maple Lawn B	Habitat Needs for Wetland Wildlife 2 *Moderator: Mary Linton*	Maple Lawn A	Wetland Restoration Case Studies *Moderator: Alice Thompson*
11:00	**Maurer**	Strategies for invasive plant management in the Chiwaukee Illinois Beach Lake Plain	**Jensen, Jens**	City of Middleton, Wisconsin, Harbor Village Northern Pike spawning habitat and streambank stabilization	**Salas**	Eco-engineering on the edge: Stream restoration, stabilization, and evaluation of risk and alternatives
11:20	**Werner**	Developing a restoration and management plan for a watershed with one creek in two states	**Casper**	Adventures in urban wetlands: a new crayfish for Wisconsin	**Roth**	Remeandering/relocating approximately 3 miles of Spring Creek through Hadley Valley Preserve (IL)
11:40	**Martinka**	Collaborating for water quality in the greater Milwaukee watersheds: The Sweet Water partnership	**Van Dyke**	Urban environments, amphibian biodiversity, and vernal pools: Does clustering affect community diversity?	**Quartucci**	Indiana toll road mitigation and urban restoration in Gary, Indiana

12:00 - 1:30 Lunch (provided) and Ramsar Celebration (Grand Ballroom)

1:30 - 2:00 Break

2:00 - 5:00 Field Trips & Working Groups

2:00 - 5:00	**Field Trips** ***Prior sign up required; check at registration desk for remaining availability.*** *** Turtle Valley Wildlife Area (departs from Ballroom Foyer)** *** The proposed Hackmatack National Wildlife Refuge (departs from Maple Lawn Foyer)**	**Practitioners Working Group** **Location: Maple Lawn B** *Moderator: Vince Mosca* 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 the 2011 conference.	**Working Group: Formation of Partners in Amphibian and Reptile Conservation (PARC)** **Location: Maple Lawn A** *Moderator: Gary Casper* The official kick-off meeting for the new Wisconsin Chapter of Partners in Amphibian and Reptile Conservation.

We want your feedback!

Please complete the conference evaluation coming to your email inbox, or pick up a hard copy of the evaluation form at the registration desk.

Thank you.

Anderson, Jim, Lake County Forest Preserve District

Biologists Across Borders: An overview of Chicago Wilderness

We all understand the challenges of striving to maximize our conservation impact using limited resources. Today, more than ever, it is imperative that we conduct our work at multiple spatial scales (e.g., site, community, landscape) to ensure that the results from our efforts extend beyond the boundaries of our individual areas of geographic focus and are synergistically aligned with other conservation initiatives. Landscape scale conservation using a green infrastructure approach is the emerging framework for the conservation community. In this session, we will discuss the protection efforts of Chicago Wilderness (CW), an alliance of over 250 diverse organizations dedicated to biodiversity conservation in the Chicagoland area. Established in 1996, CW is one of a growing number of metropolitan conservation partnerships emerging across the country. In 2004 CW developed a Green Infrastructure Vision for the multi-state Chicago metropolitan landscape with the goal of protecting 1.8 million acres by 2060. Since that time, the alliance has worked to turn that vision into an on-the-ground reality through a number of innovative initiatives that include, among others, A Chicago Wilderness Wetlands Conservation Strategy, technical outreach to municipalities through the Sustainable Watershed Action Team (SWAT) program; climate change planning for biodiversity, formal identification of regionally important species, natural communities, and resource protection areas using scientifically-based criteria; and development of a regional sustainability assessment tool and decision-support system.

Biologists Without Borders: Ideas & Plans, Thursday, February 23, Maple Lawn C, 9:30 - 9:50 am

Aten, Nancy, Landscapes of Place LLC
Dan Collins, Landscapes of Place LLC

A participatory 100-year plan for a wild place in Milwaukee's Menomonee Valley

Demonstrating the opportunity to strengthen both urban and ecological qualities, the landscape restoration plan for 25 acres in the urban Menomonee Valley values wildness, delight, and learning with a strong ecological heart. This is a place along a river that has been both invisible and inaccessible to people for decades. From the perspective of the river and of wildlife, it is also a place that has been mistreated for a hundred and sixty years. A linear pocket of former industrial land is bordered on one side by the urban Menomonee River, in its last natural stretch before confinement downstream by sheet pile walls, and on the other side by the railroad. These 25 acres, two miles from the heart of downtown Milwaukee, provide tremendous opportunity for an idea that has emerged with much time, conversations, inspiring partners and eager neighborhoods: to make a significant wild place in this valley. The overarching goal: to transform the irreversibly altered land and hydrologic conditions to a mosaic of biodiverse landscapes, including forest, prairie, and ephemeral wetland, native to Milwaukee and ecologically appropriate for new conditions, with systemic and meaningful engagement of the community. This poster will describe how analysis led to plan details that are incremental, adaptive, deal with some challenging conditions, and think 100 years out -- and particularly focus on the questions of how to develop a restoration plan that enables deeply participatory restoration on such a scale and scope.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Bart, David, UW-Madison Dept. of Landscape Arch.
Tara Davenport, UW-Madison
Patricia Perez-Bonilla, U. of Puerto Rico-Arecibo
Quentin Carpenter, UW-Madison

Land-use legacies and fen recovery after intensive agriculture

Comparisons of farmed versus never farmed wetlands suggest that agricultural legacies alter vegetation recovery. How patch-level recovery is impacted by legacies has been little studied. Here we present a case study examining how interactions among localized legacies, site-scale legacies, and non-legacy-impacted conditions alter vegetation recovery in WI fens formerly incorporated into a mint farm. We compared land-use history, hydrology, nutrient availability, soil compaction, shading, and herbaceous communities among patches within four farmed fens and a never-farmed reference site. Results indicated that: 1) plowing-induced internal eutrophication increased available P, which is associated with the loss of native graminoids and an increase in clonal forbs, 2) these clonal forbs shifted from wetland generalists to mesic-weedy species with lower groundwater influence and increased distance from tile lines, 3) a shade tolerant forb community dominated where available P and shade interacted, and 4) *Phalaris arundinacea*-dominated communities emerged within 10 meters of tile lines, but only if available P was elevated and soil compacted. These results suggest that legacy P drives recovery toward clonal dominants, the identity of which depends on interactions with localized legacies (e.g. soil compaction) or non-legacy impacted environmental conditions (e.g. shade). Future research will determine the cause of the loss of native graminoids and find a causal connection between the soil compaction/P availability interaction and *Phalaris* invasion.

History as a Factor in Wetland Restoration, Wednesday, February 22, Maple Lawn A, 1:20 - 1:40 pm

Baum, Mary Kay, forMemory, Inc.

Embracing Wisconsin wetlands for wellness

The average urban dweller needs to understand "what is in it for me" to embrace Wisconsin's wetlands. Few respond to academic presentations about the work horse that wetlands are. Some happen upon an educational tour at a local wetland. But how to reach masses of people busy tending to survival with little awareness of their interdependence with wetlands and their transition zones? And how to improve the outreach of environmental activists and educators through showing connections between stewarding one's personal health, the health of all communities, and the health of earth? In the past three years three Wisconsin sisters have spoken to hundreds of small groups, sharing their personal story of cognitive changes, aided by the help of video and photography. In church basements, civic club luncheons, and assisted living homes people's priorities have changed. Feedback consistently showed that people who see and hear their stories of interconnections have more hope... hope in maintaining wellness and preventing health risks by stewarding ecology. "Environmental Threats to Healthy Aging: With a Closer Look at Alzheimer's & Parkinson's Disease" (October 2008) by the Greater Boston Physicians for Social Responsibility is a starting point. But our message goes deeper since health benefits have economic sustainability benefits as well. Attendees will learn a new way to bring their message of embracing Wisconsin wetlands to urban audiences. Hope is the decision to imagine a healthier and more connected world, AND hope is the decision to join with others to embrace and reclaim that healthier and more connected world.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Belby, Colin, UW-La Crosse
Ryan Perroy, UW-La Crosse
Nicole Feldmeier, UW-La Crosse

Mapping the vertical distribution of lead in the La Crosse River Marsh using X-ray image analysis and X-ray fluorescence

An estimated 9,000 non-military shooting ranges exist in the U.S., many of which have operated for decades with limited removal of spent munitions. In La Crosse, WI, a trap shooting range operated between 1932 and 1963 along the shoreline of the La Crosse River Marsh, an ecologically significant urban wetland located in the Mississippi Flyway. Spent shot stored in the marsh sediment potentially poses a threat to the health of the marsh ecosystem and the thousands of annual visitors that utilize trails bisecting the shot fall zone. During the summer of 2011, 32 georeferenced sediment cores were collected throughout the former gun club's shot fall zone. Non-destructive X-ray images were taken to quantify lead shot abundance and burial depth to develop a 3-dimensional map of shot in the marsh sediment. Up to 50,000 pellets/m^2 were found in the shot fall zone, 130-200 meters from the four former trap stations. The shot is primarily located 15-30 cm below the sediment surface where it likely poses a low risk of ingestion by wildlife. X-ray fluorescence (XRF) analysis of sediment from the cores is used in conjunction with the X-ray images to evaluate the mobility of lead shot weathering products within the soil column. X-ray image analysis of sediment cores provides an accurate and inexpensive technique for mapping buried lead shot associated with gun club and hunting activities, and XRF analysis enables rapid quantification of trace metal concentrations in a large number of sediment samples.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Bernthal, Tom, WDNR
Tom Dahl, USFWS
Andrew Robinson, St. Mary's Univ. of Minnesota
Lois Simon, WDNR
Christopher J Smith, Jr, WDNR

Sorting out wetland change: What's really happening to wetlands on the landscape?

Accurately mapping and accounting for changes in wetland quantity, type and quality is the Holy Grail of wetland mapping, monitoring and assessment. This talk reviews the approaches taken by the WDNR to estimate and portray wetland changes on Wisconsin's landscape from European settlement to "present day" and in recent years (from 1980 to 2010). Estimates of pre-settlement wetland extent and type have been made using soil, drainage and vegetation data. Comparison to current day conditions is rarely "apples to apples," however, and lacks geospatial precision. Urbanization particularly obscures the hydric soil finger-print. The Potentially Restorable Wetlands (PRW) mapping process provides a conservative representation of original wetlands and lost wetlands at a watershed scale, allowing a comparison of relative levels of loss and abundance among watersheds, but summing these will not account for the state's total wetland loss since settlement. Improvements in remote sensing, ancillary data and mapping techniques have all greatly increased our ability to identify wetlands. This results in more precise and accurate maps but would yield a "false gain" if one simply compared an earlier WWI county map to a more recent one to quantify wetland change. Status and trends mapping techniques and statistically based sampling are essential to making accurate estimates of loss and gain, but do not result in comprehensive maps useful to project planners. The first status and trends study for Wisconsin is currently under way in parts of the Lake Michigan Basin. The goal of characterizing wetland condition is also being addressed in this study.

Approaches to Wetland Mapping and Assessment, Wednesday, February 22, Maple Lawn B, 1:00—1:20 pm

Brandt, Tyler, WDNR
Andrew Badje, WDNR
Rori Paloski, WDNR
Tara Bergeson, WDNR
Joshua Kapfer, UW-Whitewater

Analysis of Northern Cricket Frog (*Acris crepitans*) overwintering sites in Southwest Wisconsin

The decline of the northern cricket frog in much of its northern range, which includes southern Wisconsin, remains unexplained. It was once considered one of the most abundant frogs in southern Wisconsin, having been reported in 31 counties. Now one of the rarest frogs in the state, the cricket frog is limited primarily to Iowa, Grant, and Lafayette counties in southwest Wisconsin. A lack of suitable overwintering habitat may influence the distribution of this species. The cricket frog's situation is unique in that it cannot dig below the frost line to avoid freezing and it cannot withstand freezing like other terrestrially-hibernating hylid (treefrog) species. Therefore, the northern cricket frog must require very specific overwintering microhabitats. The objective of this study was to gain a better understanding of which microhabitats are selected by overwintering cricket frogs in Wisconsin. This included surveying for and characterizing northern cricket frog hibernacula. Over the study period, a total of 19 occupied hibernacula were discovered at four sites. Cricket frogs were observed overwintering along rivers and streams in narrow cracks and crevices that form on benches created by the sloughing of the bank. Conservation of this state endangered species should take into consideration its overwintering requirements. Alterations to the banks of river and streams should be avoided in cricket frog sensitive areas.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Brotkowski, Lesley, BHE Environmental
Emy M. Monroe, University of South Dakota
Dan A. Soluk, University of South Dakota
Hugh B. Britten, University of South Dakota

Conservation genetics of Hine's Emerald Dragonfly (*Somatochlora hineana*) in heavily urbanized and minimally affected areas

Somatochlora hineana (Hine's Emerald Dragonfly, or HED) is the only federally endangered dragonfly and is found in MO, WI, IL, and MI. Its persistence depends on understanding genetic variability and structure within and among populations. The goal of the project is to determine levels of genetic variability and to estimate genetic connectivity between dragonflies in the remaining occupied sites. Large numbers of HED are found in Door Co, WI, in wetlands that are relatively intact compared to smaller numbers found in heavily urbanized areas along the Des Plaines River near Chicago, IL. Genetic material was obtained from larval tarsi and adult wing clip samples. DNA is extracted from the tarsi and wing clips and genetic variability is assayed at 10 microsatellite loci. Ten microsatellite markers were used to assess genetic variability and population structure in HED from sampling sites in WI, IL, and MI. Genetic variation is structured into three populations: individuals from IL are one, those from Door Co. and MI creates a second, with a third population at Cedarburg Bog, WI; individuals from Southeastern Wisconsin are still being analyzed. Results thus far show IL populations are genetically variable and need to be conserved despite heavy human impacts in the area. Current populations in both WI and IL would be useful for augmentation or re-introduction of the species across its former range.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Brown, Josh, Cardno JFNew
Jameson Loesch, Cardno JFNew

Using a GIS model to systematically prioritize potential wetland mitigation banks in Wisconsin

As demand for wetland mitigation banking increases, efficient and effective methods for selecting mitigation bank sites become key. Oftentimes, mitigation bank site selection can be either an opportunistic or time intensive process. To address these ongoing needs for mitigation, Cardno JFNew partnered with WisDOT to develop a repeatable GIS model to rank potential wetland mitigation bank sites throughout Wisconsin. Two main GIS layers, county tax parcels and potentially restorable wetlands (PRW), as well as several other layers, were used to determine potential mitigation bank sites. Large areas of contiguous parcels containing large percentages of PRW were targeted to promote ecosystem function and the economic viability of the potential mitigation bank. After the top sites were determined, drive-by surveys were conducted to verify modeled results and further evaluate the sites for additional qualitative criteria such as topography, hydrology, and restoration feasibility. Sites were then ranked in order of greatest potential for restoration. Our results were further evaluated by a WDNR-created GIS model that evaluates the restoration potential of sites at a smaller scale using existing adjacent habitats. This GIS model is easily applied to any area in Wisconsin and can be an effective first step in choosing wetland mitigation banks throughout the state.

Strategies for Prioritizing Restoration, Wednesday, February 22, Maple Lawn C, 1:40 - 2:00 pm

Carson, Eric, WI Geological & Nat. History Survey
Reed P. Scherer, Northern Illinois University
Barbara Winsborough, Winsborough Consulting

Late Pleistocene - Holocene lakes in the lower Wisconsin River valley, southcentral Wisconsin

A series of lakes formed in the Black Earth Creek and Wisconsin River valleys during the waning stages of the last major glaciations of North America. While some of the lakes were directly dammed by glacial ice, the majority were formed by outwash aggrading in the two valleys and blocking the mouths of tributary valleys. The outwash-dammed lakes persisted from late glacial time through, in some cases, the late Holocene. Two such lakes—one in an unnamed valley near Cross Plains, WI, and the other in Marsh Valley near Mazomanie, WI—have recently been cored to assess the geochronologic and paleoenvironmental data preserved in the lake sediments. The "Swamplovers site" near Cross Plains was established as a lake by 17,200 cal yr BP and existed until at least 7700 cal yr BP, at which time it converted to a swamp; the "Marsh Valley site" near Mazomanie was established as a lake by 20,100 cal yr BP and existed until at least 2770 cal yr BP. Initial reconnaissance analyses from the lake sediments indicate that they contain abundant and diverse assemblages of pollen and freshwater diatoms. Additionally, they contain examples of Cretaceous marine diatoms, which are likely derived from Cretaceous sedimentary strata in Minnesota and/or the Dakotas. These Cretaceous diatoms may prove to be valuable for understanding paths and mechanisms of Quaternary sediment transport in the Upper Midwest.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Casper, Gary, UWM Field Station
Mary Linton, Snapping Linton Ecology
Richard King, Northern Illinois University
Bruce Kingsbury, Indiana University-Purdue University Fort Wayne

Midwest Partners in Amphibian and Reptile Conservation

Midwest Partners in Amphibian and Reptile Conservation is a regional working group of Partners in Amphibian and Reptile Conservation. Both the regional group and national group are dedicated to the conservation of native herpetofauna (reptiles and amphibians) and their habitats. The Midwest region includes: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota and Wisconsin. Recent Midwest PARC projects include a Blanding's Turtle Conservation Assessment, Prescribed Burning Guidelines for Amphibians and Reptiles, and Habitat Management Guidelines. Midwest PARC is also participating in the Year of the Turtle (2011) and Year of the Lizard (2012) PARC initiatives. For more products and projects visit our website: http://www.mwparc.org/.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Casper, Gary, UW-Milwaukee Field Station
Thomas G. Anton, Field Museum of Nat. History

Adventures in urban wetlands: a new crayfish for Wisconsin

While developing new techniques for monitoring pond breeding salamanders in the western Great Lakes region, using unbaited traps shortly after spring ice-out, we discovered through serendipity that semi-terrestrial burrowing crayfish use the same ponds at the same time as the salamander targets, and are easily trapped with them. These crayfish spend most of their lives in deep burrows, but emerge in early spring for breeding congregations, often in vernal ponds. In southeast Wisconsin, these are the devil crayfish (*Cambarus diogenes*) and the prairie crayfish (*Procambarus gracilis*), the latter a State Special Concern species. They act as keystone species, their burrows providing drought refuges and winter denning sites for other animals. Hence, knowledge of their distribution and status is important to conservation planning. We have substantially expanded the northern and western range limits of the prairie crayfish in Wisconsin, and documented hitherto unknown forested habitat associations. In 2011 we discovered digger crayfish (*Fallicambarus fodiens*) in extreme northern Ozaukee County, another semi-terrestrial primary burrower with only one unverified prior record for Wisconsin (Dane County in 1915). Long predicted to occur in southern Wisconsin, this represents the first confirmed occurrence. The early spring trapping technique is highly successful in capturing burrowing crayfish. Prior survey techniques utilizing laborious excavation or pumping of burrows, or rainy nighttime searches, are much more costly and less successful. We expect the trapping protocol to be a useful tool for future studies, and continue to greatly expand our knowledge of these hard to study but ecologically important creatures.

Habitat Needs for Wetland Wildlife 2, Thursday, February 23, Maple Lawn B, 11:20 - 11:40 am

Chappelle, Justin, Northeastern Illinois University

Ephemeral pond identification using remote sensing techniques in southeastern Wisconsin's varied landscape

Ephemeral ponds are small bodies of fishless water that appear in early spring and would usually dry up by mid-summer. They form in many shapes and sizes and are influenced by local hydrology, natural disturbances, vegetation dynamics, past glacial history in northern areas, and human impact on the landscape. Not much is known about these ponds, because they have not been properly identified and studied. Even with the most advanced spectral analysis software, a researcher would have difficulty identifying all ephemeral ponds in a given landscape. Using the remote sensing software ERDAS Imagine 11.0, ephemeral ponds would be assessed in wetland, prairie grassland, savanna, forest, and urban landscapes. Six classifications or spectral enhancement methods in ERDAS Imagine 11.0 are used to find the verified ephemeral ponds in the landscape. These classifications and methods are the unsupervised classification, image ratio classification, indices NDVI method, spectral change method, changing the RGB to HIS method, and the decorrelation stretch method. The goal is to find out which method(s) would be the most efficient in detecting ephemeral ponds in Southeastern Wisconsin's varied landscape. Unsupervised classification, indices NDVI method, RGB to HIS method, and image ratio classification proved to be the most efficient in detecting these ephemeral ponds. Specific light signatures were analyzed in each of the techniques. Further evaluation led to the conclusion that ephemeral ponds reflect a specific light signature, but further human interpretation would be needed to tell these ponds apart from other phenomena in the landscape that emit a similar signature.

Approaches to Wetland Mapping and Assessment, Wednesday, February 22, Maple Lawn B, 2:00 - 2:20 pm

Doherty, James, UW-Madison Dept. of Botany
Joy Zedler, UW-Madison

Urban stormwater appears to increase productivity and decrease diversity in natural and engineered wetlands

Nutrient-rich stormwater can degrade native wetlands by facilitating dominance by highly productive plant species that competitively exclude native species; however, the same process could be considered a benefit in engineered wetlands used to treat stormwater, where highly productive vegetation supports biofiltration, nutrient uptake, and other desirable services. Comparing a native-dominated, stormwater-influenced wet meadow and planted wetland swales within an stormwater treatment facility in the University of Wisconsin-Madison Arboretum, we found similar impacts of stormwater on plant diversity and productivity. Among 0.25-m^2 plots in the wet meadow (n = 46) and the swales (n = 104) we found no difference in shoot biomass (167 ± 77 g and 169 ± 116 g, respectively; $P > 0.05$), but higher species richness in the wet meadow (4.8 ± 2.6) than in the swales (2.6 ± 1.7; $P < 0.0001$). Shoot biomass and species richness were negatively correlated within both sites: with $R^2 = 0.29$, $P = 0.0001$ in the wet meadow and $R^2 = 0.09$, $P = 0.0025$ in the swales, and relatively high levels of shoot biomass and low levels of species richness near stormwater inflows in both sites. Our results are consistent with the idea that stormwater appears to increase productivity and decrease diversity; if that pattern is general, maintenance of diversity will require better stormwater treatment, especially nutrient removal, upstream of natural wetlands and diverse plantings will have limited viability in engineered wetlands. We recommend using small, highly productive treatment wetlands to protect the diversity of natural wetlands downstream.

Stormwater Management and Wetlands, Thursday, February 23, Maple Lawn A, 9:50 - 10:10 am

Ehlinger, Timothy, UW-Milwaukee
Bill Sasse, Village of Mt. Pleasant
Jesse Jensen, UW-Milwaukee
Alice Thompson, Thompson & Associates Wetland Services

Human-environmental history and establishing a framework for ecological restoration in an urbanizing watershed (Pike River I)

Beginning in the 1880's, the Pike River in southeastern Wisconsin was dredged and straightened to improve agricultural drainage in the surrounding watershed; the channel was deepened and straightened, flows were disconnected from the floodplain, wetlands were drained and filled, prairies were plowed, and fish passage was blocked. As towns and villages grew up in the basin, the Pike River became a low functioning river with flashy flows, poor water quality and degraded habitat. Accelerated urban development since the 1970s resulted in increased flood frequencies and magnitudes that impacted the village of Mt. Pleasant, downstream communities, and ultimately Lake Michigan. The Pike River Restoration Plan (1998) was the result of a year-long facilitated discussion among a wide range of stakeholders including the Village of Mount Pleasant, WDNR, engineers, university scientists, and community leaders. Implementation of the 9-Phase plan, made possible by a unique multi-year Chapter 30 permit, began implementation in 2002 and will create a newly restored river corridor from the headwaters of the North Branch of the Pike River, downstream approximately 5 miles to Hwy KR on the Racine-Kenosha County border. This presentation will provide an overview of the economic, community, legal and ecological issues addressed during the facilitation process, which eventually resulted in what was originally a plan for floodwater "conveyance" evolving into an integrated plan for floodplain restoration.

Involving the Human Community, Wednesday, February 22, Maple Lawn B, 3:10 - 3:30 pm

Erickson, Sara, UW-La Crosse
Colin Belby, UW-La Crosse
Ryan Perroy, UW-La Crosse

Measuring the spatial distribution of lead contaminants in the La Crosse River Marsh

The La Crosse River Marsh is a 1,077 acre urban wetland located in the heart of La Crosse, WI. From 1932 to 1963 the La Crosse Gun Club resided on the shores of the La Crosse River Marsh; in this time, large quantities of lead shot were projected in and around the marsh, making lead contamination a potential concern for the local ecosystem. The purpose of this research was to quantify the spatial distribution of lead contaminants in the marsh. A 20 x 20 meter grid covering the expected shot fallout zone was created within the marsh and 432 sample points identified. Surface sediment was collected at each sample point using a differential GPS and processed in the lab. All samples were analyzed for lead and other heavy metals via X-ray fluorescence at the University of Wisconsin - La Crosse, with 10% of the samples also analyzed externally via inductively coupled plasma analysis. Lead levels in the surface sediment (0-5 cm) range up to >17,000 ppm, with the greatest concentrations found in the shot fall zone 140 m from the former trap stations. The Environmental Protection Agency's minimum standard for lead in bare soil in which children play in is 400 ppm while other non-play areas are 1,200 ppm. Results from this study will be used to create a three-dimensional map of lead contamination within the La Crosse River Marsh and provide the framework for future studies looking at impacts on the vegetation, invertebrates, and water column.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Geddes, Pamela, Northeastern Illinois University
Yaiyr Astudillo-Scalia, NE Illinois University
Jennifer Shaier, NE Illinois University
Salina Wunderle, NE Illinois University
Joel Olfelt, NE Illinois University
Aaron Schirmer, NE Illinois University

Use of microsatellites in the identification of hybridizing cattail species in the *Typha* genus

Invasive plants pose a threat by disturbing ecosystem function and native biodiversity. Cattail plants grow in wetlands where they thrive in highly disturbed environments. *Typha latifolia* is a native species not considered to be a threat. In contrast, exotic *T. angustifolia* is a highly invasive species. Their hybrid, *T. x glauca*, is even more aggressive than *T. angustifolia*. These three *Typha* species are common in wetlands, but their identification in the field is difficult based on morphological characteristics alone due to significant overlap in phenotypic traits. This problem hinders efforts to control invasive species. Current efforts will remain unsuccessful if we cannot effectively recognize which species are problematic. In this study we are developing molecular techniques to identify species-specific polymorphisms as a more promising alternative to morphological identification. Qiagen DNeasy® Plant Mini Kits were used to extract DNA from five identified samples of each cattail species. We optimized amplification of 11 previously described microsatellite loci using polymerase chain reaction (PCR). These microsatellites were visualized in a Beckman Coulter gene sequencer and analyzed using the sequencer software to determine if they were polymorphic. Preliminary results indicate that out of the 11 microsatellite loci, at least 5 show important differences among the three cattail species, making them good diagnostic molecular markers for species identification. We are in the process of optimizing/ scoring the remaining six microsatellites. Our protocols could help environmental managers when attempting to restore invaded wetlands by either conducting the protocols themselves or outsourcing samples to other labs.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Geddes, Pamela, Northeastern Illinois University
Lisa Volesky, NE Illinois University

Effects of native and non-native strains of *Phragmites australis* on freshwater wetlands

Non-native, invasive plants are a concern for wetlands, mostly because they result in biodiversity declines. Several plant taxa possess invasive strains that are more aggressive than their native counterparts. Yet relationships between native and invasive strains and their effects on ecosystems have not been thoroughly explored. This project addressed the effects of common reed (*Phragmites australis*), a species that was thought to be exclusively non-native and greatly invasive. The success in *Phragmites*' spread had been attributed to changes in land use patterns, nutrient enrichment, and altered hydrological regimes. More recently, it has been documented that the species has both native and non-native strains, but little is known about their effects on ecosystems. The goal of this study was to investigate if the effects of *Phragmites australis* differed between native and non-native strains in freshwater wetlands. The two strains were determined using molecular analyses, and we measured their effects on soil nutrients (nitrate, ammonium, and orthophosphate), soil organic matter, soil moisture content, temperature, and pH. Our results suggest that, compared to control plots with no *Phragmites australis*, plots with the non-native strain had a stronger impact on ecosystem attributes than plots with the native strain. These findings were due to strain identity (native or non-native) and not due to differences in densities as both strains had comparable stem densities. The implications of this research are important from a restoration standpoint because efforts to control problematic species will remain unsuccessful if we cannot effectively recognize which species or strains are problematic.

Wetland Invasive Plants, Wednesday, February 22, Maple Lawn C, 3:50 - 4:10 pm

Glenzinski, Brian, WDNR
Benjamin M. Heussner, WDNR
Heidi Bunk, WDNR
Tom Zagar, City of Muskego

Big Muskego Lake: Preventing the forward switch

Big Muskego Lake went thru an extensive and successful lake restoration in 1995-96. Improved water quality, plant diversity, and fisheries were noted soon after restoration and have been monitored ever since. A lake management plan was written in 2004 to "set the course for management of Big Muskego." Water quality, vegetation, and fishery indices identified in the plan were used to initiate management decisions. The monitoring of these variables gave managers the data necessary to make informed decisions and demonstrate the need to the general public. Shallow lakes can easily switch from a clear water state to an algae dominated state depending on these variables, and this plan is critical in preventing the forward switch on Big Muskego and allowing resource managers to make science-based decisions in an urban area with diverse opinions on lake management. Ongoing bio-manipulation and a recent water level manipulation were inacted in an effort to maintain the high quality wetland community. Big Muskego Lake is an excellent example of shallow lakes management and a good template for resource based planning in urban areas.

Management Planning for Wetlands, Wednesday, February 22, Maple Lawn B, 11:20 - 11:40 am

Glisson, Wesley, Northwestern University
Ryan Brady, WDNR
Andy Paulios, WDNR
Dan Larkin, Chicago Botanic Garden

Determining habitat requirements and restoration targets for secretive marshbirds

Secretive marshbirds (SMBs) are a group of environmentally sensitive species, including rails, bitterns, coots and grebes, that are of high conservation concern both in Wisconsin and nationwide. Several species appear to be in decline while trends for others remain largely unknown. Challenges in monitoring SMB populations and subsequent gaps in research have resulted in this group being underrepresented in bird monitoring programs, wetland conservation planning, and restoration targets. A better understanding of SMB habitat requirements and the efficacy of wetland restoration for their support are needed to advance SMB conservation. In 2011, we sampled SMB habitat in 20 reference and 10 restored wetland sites in the southeast glacial plain of Wisconsin. SMB habitat was measured on three scales: intensive vegetation/habitat surveys, coarse habitat surveys, and landscape analyses. Reference sites were surveyed for SMBs in 2008 – 2011 while sites restored through the USDA Wetland Reserve Program were surveyed in 2011. Suitable vegetation types were SMB species-specific. Overall, cover of sedges (*Carex spp*.) and cattails (*Typha spp*.) were positively correlated with SMB abundance, while cover of reed canarygrass (*Phalaris arundinacea*) was negatively correlated. Shrub and tree cover at the site appeared to decrease habitat suitability for SMBs. Restored sites appeared unlikely to effectively support SMBs due to dominance by reed canarygrass (found in 60% of restored sites vs. 20% of reference sites). Our results indicate that plant-community composition is an important factor in habitat suitability for SMBs. Reducing dominance of reed canarygrass may help management and restoration efforts meet SMB conservations goals.

Habitat Needs for Wetland Wildlife 1, Thursday, February 23, Maple Lawn B, 9:50 - 10:10 am

Greene, Kimberly, Loyola University Chicago
Nancy Tuchman, Loyola University Chicago
Beth Lawrence, Loyola University Chicago
Shane Lishawa, Loyola University Chicago

Effects of *Typha x glauca* on aquatic macroinvertebrate communities in Northern Lake Huron Coastal Wetlands

Invasive species impact wetland ecosystems by decreasing biodiversity, altering ecosystem function, and modifying nutrient cycling. *Typha x glauca* (*Typha*) is an invasive hybrid cattail found throughout the Great Lakes, especially in areas influenced by urban development. *Typha* invasions are associated with changes in soil composition and decreases in native wetland plant diversity. Few studies have explored the effects of *Typha* on aquatic macroinvertebrate communities. Macroinvertebrates are vital components of wetland ecosystems, serving as important food resources to fish and migratory birds. To examine the effect of *Typha* invasion on aquatic macroinvertebrate communities we are conducting an aquatic macroinvertebrate survey in native and *Typha*-invaded wet meadow and emergent marsh habitats at three northern Lake Huron coastal wetlands. We collected aquatic macroinvertebrates during June, July, and August of 2011 for survey data. Preliminary data suggest that there is a shift in aquatic macroinvertebrate community composition between habitats invaded by *Typha* and those characterized by native wetland vegetation. Results from our study could be used by wetland managers to mitigate *Typha* invasion so as to alleviate impacts on fish and wildlife dependent on Great Lakes wetlands.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Griffin, Rusty, USFWS
Thomas Dahl, USFWS
Julie Michaelson, USFWS

Characterization and analysis of wetland restoration sites in Wisconsin

Mitigation, wetland reestablishment and creation are forms of resource management aimed at curtailing wetland acreage losses. Between 2003 and 2008 there were 431 restoration projects that reported wetland acreage gains in Wisconsin. This study examined the geospatial extent and ecological characteristics of habitats encompassed in these restoration project areas. An initial analysis of the restoration project data was collected as part of a pilot study that would facilitate the sharing of state-level watershed restoration data on a national scale. Examination of the wetland restoration project areas indicated that administrative tracking was fairly complete however; there was a lack of specific geospatial tracking information on wetland types and extent. This is important information for monitoring wetland acreage reestablishment resulting from ecological restoration projects. The restoration project information from Wisconsin was further examined using contemporary imagery in combination with field verification. There were two specific objectives: 1) Accurately delineate wetland boundaries within the project areas and identify pre-existing wetland area (not attributable as wetland acreage gains), reestablished wetland area and type(s) and any upland included within the project and, 2) Classify wetland(s) to ensure that the geospatial data would be compatible with the requirements of the Wetlands Geospatial Data Layer. The results from this comprehensive examination of sites provided information on acreage and types of wetlands reestablished, landscape setting, and restorations not completed. The results are valuable for further identifying challenges, for tracking restoration projects, as well as for understanding current trends in wetland reestablishment.

Approaches to Wetland Mapping and Assessment, Wednesday, February 22, Maple Lawn B, 1:20 - 1:40 pm

Grunert, Brice, UW-Milwaukee
Emily Tyner, UW-Milwaukee

Restoring an urban wetland: Lessons on strategy

The Grand Trunk wetland is located in the heart of the industrial inner harbor of Milwaukee, WI. The site contains 6 acres of persistent wetland and approximately 30 acres of historic wetland (now brownfield) that has been filled throughout the site's use. The primary goal of the project is to deepen the main channel that was historically connected to the Milwaukee River Estuary (now Milwaukee Harbor), remove fill and plant native plants, with an emphasis on sedges and emergent macrophytes adapted to varying water levels characteristic of a seiche wetland. Funds have been obtained to deepen the main channel starting in 2013. Any remaining funds will be used to remove fill and extend the size of the persistent wetland. The overall goal of the site is to reconnect the wetland with the Milwaukee River Estuary and plant the site with native vegetation to provide functional use as fish spawning habitat and a refuge for local and migrating birds. The site will also be used as an educational tool to broaden public awareness of urban wetlands, with the site acting as a model for further urban wetland restoration throughout Southeastern Wisconsin. There has been enthusiastic buy-in to the restoration efforts from the local community and the City of Milwaukee. Two concerns for the long-term success of the site are: (1) site size may be too small for recolonization and persistence of native flora, and (2) funding for complete restoration has not been attained.

Involving the Human Community, Wednesday, February 22, Maple Lawn B, 3:50 - 4:10 pm

Hardin, Carmen, WDNR
Drew Feldkirchner, WDNR

Biological inventory of forested ephemeral ponds in Northern Wisconsin

Ephemeral ponds, also called vernal pools, are important sources of biodiversity in the forests of northern Wisconsin. The goals of this project are to understand the habitat value of ephemeral ponds in different northern Wisconsin forest types, determine if ephemeral ponds can be classified or categorized based on pond/habitat characteristics, evaluate the general effects of timber harvesting on ephemeral ponds, partner with other ephemeral pond projects in Wisconsin, and use the findings to inform the development of ephemeral pond habitat guidelines. Surveys were conducted on over 50 ponds in 2011, including baseline surveys of pond characteristics, amphibian surveys (visual and egg mass), aquatic invertebrate surveys, and rare plant and natural community surveys. Surveys will be repeated on these ponds in 2012. A summary of the first year of data collected will be presented. This project is supported by a State Wildlife Grant; a Northeastern Area State and Private Forestry Competitive Grant; and the WDNR Division of Forestry. Additional support was provided by private landowners and volunteers.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Jensen, Jens, Cardno JFNew

City of Middleton, Wisconsin, Harbor Village Northern Pike spawning habitat and streambank stabilization

Cardno JFNew assisted the City of Middleton, Wisconsin, with their plan to create Northern Pike spawning habitat. Being a top level predator on most of our Wisconsin Lakes, northern pike are a very important to both the ecological balance of lake's ecosystem and as a sport fish. The project had dual goals to enhance the ecological aspects of the lake's ecosystem, while also enhancing sport-fishing on the Madison chain of lakes. The proposed spawning habitat is within the City's conservancy park in the floodplain of Pheasant Branch Creek, which drains into Lake Mendota. The goal of the project was to encourage natural reproduction of the Northern Pike population on Lake Mendota. The project also had the goals of vegetative restoration, habitat enhancement and streambank stabilization. The spawning habitats required excavation to create shallow seasonally flooded spawning habitat. Depth and elevation of the habitat area were determined using elevations relative to daily gauge data on Lake Mendota to achieve optimal depth during the spring spawning season. Native wetland vegetation conducive to pike reproduction was installed in the habitat areas. Monitoring is planned in the following years to determine success of the pike habitat area.

Habitat Needs for Wetland Wildlife 2, Thursday, February 23, Maple Lawn B, 11:00 - 11:20 am

Jensen, Jesse, UW-Milwaukee
Timothy Ehlinger, UW-Milwaukee
Angie Ortenblad, UW-Milwaukee
Alice Thompson, Thompson & Associates Wetland Services

Factors affecting degradation and recovery of aquatic ecological integrity in urbanizing watersheds (Pike River III)

Seldom is a single direct cause responsible for an observed ecological change in aquatic environments, non-the-less, compliance with the US Clean Water Act stipulates that the monitoring water quality criteria and corrective actions address single parameter criteria. This approach has typically resulted in less success in achieving restoration targets for fish and invertebrates. Many streams draining agricultural lands are rapidly urbanizing, and typically contain fewer species of biota and reduced fish biomass as a result of the "urban stream syndrome" – a condition characterized by flashiness, increased sedimentation, and loss of habitat. This presentation examines the relationships among toxicology, land cover, hydrology, instream habitat, substrate, water quality and their resultant effects on the ecological success of stream restoration efforts in the Pike River in southeastern Wisconsin and on fish and macroinvertebrate communities in 8 streams within the Western Lake Michigan Drainage Basin. Selected bioassays were used to assess the level of total toxicity in sediments and pore waters through the observation and interpretation of both lethal (i.e. relative mortality, germination rate) and sub-lethal (i.e. feeding inhibition, growth inhibition) responses in organisms. Land cover of sub-watersheds and in-stream substrate composition were the best predictors of fish assemblages, suggesting that catchment-level stressors are the dominant factors influencing fish biological integrity. In contrast, ecotoxicological metrics best-predicted aquatic invertebrate assemblages, indicating that conditions on the more local scale impact benthic assemblages. The results also show that ecotoxicological effects from tributaries have a greater impact on invertebrates than toxicity measurements taken within the Pike River mainstem.

Wetland Restoration Techniques, Wednesday, February 22, Maple Lawn C, 11:00 - 11:20 am

Johnson, Sarah, Northland College
Donald M. Waller, UW-Madison

Contrasting changes in urban and rural floodplain forests: A 55-year view from the understory

Changes in land use, altered flow regimes, species invasions, and climate change have modified riparian forests around the world yet often go unnoticed due to a lack of reliable baseline data. We used quantitative surveys from the 1950s to reconstruct a detailed picture of plant community change across 40 floodplain forests in southern Wisconsin. Using partial least squares regression (PLS), we evaluated the relative roles of habitat quality and current and historic landscape configuration on patterns of local and regional plant diversity and composition and their changes over the past 55-years. Both local and landscape variables affected community composition and change, but landscape factors have more influence on late 20th century changes in these communities. Sites surrounded by more contiguous forest had more exotic plants in the 1950s yet native diversity has increased since then in these stands. These sites have also converged in composition since the 1950s, mostly due to increases in a few common native species and wetland indicators. These changes likely reflect increases in the frequency and duration of flooding at these sites. Diversity at these sites has increased in response to the extent and contiguity of forested corridors. Within more fragmented urbanizing landscapes that rarely flood, woody and exotic plants typical of upland forests have increased. This has diminished local species diversity but increased regional diversity. Local species diversity remained higher at frequently flooded sites in more fragmented landscapes, suggesting that natural flooding regimes serve to maintain native species diversity and composition in otherwise fragmented landscapes.

History as a Factor in Wetland Restoration, Wednesday, February 22, Maple Lawn A, 1:40 - 2:00 pm

Joyce-Krieg, Judith, EarthView Environmental, LLC

Integrating natural areas into your community: Using mitigation for "out of the box" funding

Over the past 30 years, the amount of time children spend inside plugged into electronic devices such as television, video games and computers has significantly increased. In contrast, time spent playing and exploring outdoors has significantly decreased. Green space has been replaced by screen space. Grassroots movements across the county are focusing their efforts to get kids "back into the woods" giving rise to a trend to bring nature back to school campuses. However, in this economic climate, funding for environmental education is limited. By focusing on the entire watershed and reaching out to teachers and schools, entities needing wetland mitigation can provide schools and educators with the means, while achieving their mitigation requirements. As a result, innovative wetland mitigation plans include designs which enhance the neighborhood's natural systems and provided walkable outdoor classroom space. Case studies show that incorporating wetlands and streams back into communities can successfully be funded through mitigation funds, providing a "win-win" for the kids and the permittee needing an appropriate mitigation site. Continued efforts are needed to connect county/ state roads and engineering departments with educators and school districts and develop a watershed plan which uses mitigation requirements to incorporate natural areas back into our schools and neighborhoods.

Involving the Human Community, Wednesday, February 22, Maple Lawn B, 4:30 - 4:50 pm

Knapp, Andrew, Lakeshore Technical College
Horticulture Technician program students,
Lakeshore Technical College
Jim Kettler, Lakeshore Nat. Resources Partnership

Hika Park concept designs

Lakeshore Technical College (LTC) has engaged with the Lakeshore Natural Resource Partnership (LNRP) to participate in a grant application for wetland re-creation, stream bank re-channelization, and overall watershed ecosystem improvement around Hika Bay in Manitowoc County. First year Horticulture Technician students at LTC are participating in several service learning projects including landscape design concepts for restoring and redeveloping part of the Hika Bay shoreline. The design concepts have been submitted as part of a grant application through the LNRP. These designs successfully combine native wetland plantings with low impact recreational use while creating stormwater retention and detention; illustrating how wetlands can be incorporated as multi-functional and aesthetically beneficial green infrastructure within urban development. Student work groups will present their designs as part of the larger watershed health improvement movement underway around Hika Bay.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Korb, Randy, Wisconsin Salamander Survey

Salamander occurrence in the urban wetlands of Madison and Green Bay, Wisconsin

Amphibians are sensitive to environmental conditions and changes in all life cycle stages and thus indicate the health of natural communities, including wetlands. The Wisconsin Salamander Survey develops statewide geographic distribution information and fills in gaps on four terrestrial woodland species. It also documents new county records for these species, increases awareness of and conservation for salamanders, and is a precursor to a long-term monitoring effort. Trained citizen monitors select and sample potential wetland breeding habitats by placing live traps for adult salamanders beginning in late March in southern counties and mid- to late April in northern Wisconsin. In the past four years over 100 citizen monitors have documented the presence or absence of tiger salamanders, spotted salamanders, blue-spotted salamanders and central newts in nearly 200 urban and rural wetland sites in 25 counties. Salamander monitors have surveyed the significant urban wetlands in and around Madison and Green Bay since 2008. The maps of these two cities show locations of all urban wetlands surveyed and the sites inhabited by salamanders, by species.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Link, Evan, Lawrence University
Brock Woods, WDNR and UWEX

Non-native *Phragmites australis* may spread via cut stem fragments

Invasion of Wisconsin wetlands by non-native *Phragmites australis* is a growing concern. Initial dispersal of the plant into new, distant areas via roadside ditches appears to be common since new local infestations are often first seen in such sites. Conventional wisdom suggests that distance dispersal is primarily by seed, but we wondered if transported stem fragments with nodal buds might also play a role. We cut mid-summer *Phragmites* stems into various lengths and placed them on water and a variety of moist substrates. New stems sprouted from a high percentage of nodal buds within several days in most settings. (Fragments that sank in deeper water did not fare well.) New roots generally followed within a week or two. Longer fragments with many nodes were more successful and often sprouted numerous new stems; however, many fragments just large enough to contain a single node (and bud) also produced new (single) stems. We also sampled roadside mower clippings and found they were often from several cm to over half a meter long. Thus, it appears that mowing practices common along roads could easily spread stem fragments capable of sprouting into new plants wherever mowing (or subsequent flooding) deposits them on wet to moist substrates. Any cutting by landowners or managers that leaves behind stem fragments in such locations might, in fact, also compromise control efforts, or even help spread the plant. Anyone involved in such efforts should carefully consider whether leaving stem fragments behind is likely to be problematic and plan accordingly.

Wetland Invasive Plants, Wednesday, February 22, Maple Lawn C, 3:30 - 3:50 pm

Linton, Mary, Snapping Linton Ecology
Alice Thompson, Thompson & Associates Wetland Services
Samantha Foster
Penni Klein, City of Middleton

Pheasant Branch Conservancy Blanding's Turtle research by Middleton, Wisconsin, citizens: Many eyes and hands

Citizens of Middleton, Wisconsin, have been monitoring the Blanding's turtle, *Emydoidea blandingii*, populations in Middleton's wetlands for three years. Here we focus on work done in the Pheasant Branch Conservancy, a 550-acre high-quality wetland complex that flanks Pheasant Branch Creek. Citizens in the 2009 basking survey positively identified Blanding's turtles in the conservancy. In 2011, researchers, three Middleton High School students, and numerous Friends of Pheasant Branch intensified efforts to track Blanding's use of Pheasant Branch marsh, and identify nesting areas and hibernation sites. Hoop traps were set in the main channel and side channels to survey and collect Blanding's turtles. 7 male, 1 female, and 1 juvenile Blanding's were collected in three weeks of trapping. Two males and the one female were fitted with radio transmitters. Radio-tagged turtles were located once/ week until the end of October. Location data showed that they used the entire run of Pheasant Branch Creek for feeding. The female did not mate, so nesting sites were reported by citizens who saw females digging nests. Artificial nest mounds were also used. The radio-tagged turtles were tracked to their hibernation site in late October. Most nesting and all hibernation sites were within Pheasant Branch Conservancy. This information has been used by the City of Middleton to preserve and protect the Blanding's populations living in their wetlands.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Little, Amanda, UW-Stout
Hope Larsen, UW-Stout
Charles Erickson, UW-Stout

Riparian soil, reed canarygrass (*Phalaris arundinacea*), and plant species richness in trout stream restorations

Invasive plant species such as reed canarygrass (*Phalaris arundinacea*) are a concern in trout stream restorations throughout the state of Wisconsin, due to interest in restoring native prairie in the riparian zone. We investigated how techniques that excavate riparian soil in order to restore incised streams to their floodplains affect riparian soils and plant communities in a stream in western Wisconsin. We assessed soil attributes, plant species richness, and the abundance of *P. arundinacea* in riverine plots (within 10 m of stream) and within the floodplain, but non-riverine (20 to 50 m away). There was little difference in soil texture, nitrate-N, ammonium-N, or organic matter between riverine and floodplain plots. In the first year post-restoration, there was less *P. arundinacea* in riverine than floodplain plots ($T = 1.61$, $P = 0.131$, $df = 13$). This relationship reversed in the second year, as *P. arundinacea* had significantly greater increase in the riverine than floodplain plots ($F = 19.34$, $P < 0.001$, $df = 23$). In both years, *P. arundinacea* abundance had a significant negative relationship with richness. The relationship between plot location and richness changed from a slightly higher richness in riverine locations in year 1 to a significantly lower richness in riverine locations in year 2, most likely due to a dramatic increase in *P. arundinacea*. These results suggest that trout stream restoration provides a unique opportunity to restore high-quality native riparian vegetation, but methods to prevent invasive species colonization are needed.

Wetland Invasive Plants, Wednesday, February 22, Maple Lawn C, 3:10 - 3:30 pm

Magyera, Kyle, Wisconsin Wetlands Association
Erin O'Brien, WWA

WWA's Local Outreach Program: Integrating Lake and Wetland Conservation

The Wisconsin Wetlands Association (WWA) has a local outreach program intended to help educate local decision-makers about the public benefits of wetlands and to provide tools and resources that help local decision-makers address challenges and opportunities associated with administering land use and wetland conservation policies and programs. WWA recently received a Technical Service Provider Contract from the WDNR Lakes Program to continue and expand the delivery of education and outreach to local decision-makers and new audiences, including watershed groups and lake associations. Key goals of our work under this WDNR contract will be to 1) improve lake leaders' understanding about the connections between lakes and wetlands and help them communicate with their communities about wetland concerns; 2) increase interest in evaluating and addressing wetland concerns in lake planning, protection, restoration and management efforts; and to 3) increase Lake Grant applications for wetland projects that will benefit lake water quality and habitat. Ultimately, we hope to encourage more public and private investment in wetland protection and restoration as a means to improve water quality and recreational opportunities in and near Wisconsin's lakes and rivers. Please stop by to learn more about this project and share perspectives on the opportunities to meet these goals.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Martin, Alex, WDNR

Wetland forests in Wisconsin: Trends and restoration possibilities

The national trends are that wetland acreage has declined from 2004-2009 in acreage by an estimated 62,300, an average loss of 13,800 acres of wetland per year. This is a change from 1998 to 2004 when the overall wetland acreage increased approximately 220,200 acres. Most freshwater wetland types saw some gains or moderate losses. The losses in forested wetlands mostly negated the gains in other freshwater wetlands. Forested wetlands had the greatest losses: 663,100 acres. Because of this loss, it is the first time in US history that forested wetlands are not the majority of wetland acreage. There are many potential reasons for this. Some are due to how humans have developed the land or used the resources on the land. Some is due to how we have chosen to restore our wetlands. In Wisconsin we have seen a significant loss of forested wetlands, from an estimated 3,688,327 acres before settlement to 1,785,932 acres identified in the Wisconsin Wetland Inventory, data sources for which range from 1978 to 2009. In order to help reverse the loss, we need to understand not only why these wetlands are being lost but also why they are not being restored at the same rate that other wetland types are being restored. For the protection of wetland forests, it is important to understand where these forests still exist. It is also important to understand this so that we can develop plans for forested wetland reestablishment projects that reverse the losses where they have occurred. This discussion will present some of the reasons for the loss of forested wetlands, as well as demonstrate where the forested wetlands restoration efforts can be focused.

Approaches to Wetland Mapping and Assessment, Wednesday, February 22, Maple Lawn B, 2:20 - 2:40 pm

Martinka, Jeff, Sweet Water

Collaborating for water quality in the greater Milwaukee watersheds: The Sweet Water partnership

Sweet Water, the Southeastern Wisconsin Watersheds Trust, Inc., is a Milwaukee-based nonprofit partnership established to achieve healthy and sustainable water resources throughout the 1,100 square mile Greater Milwaukee watersheds. We address issues facing our five watersheds and nearshore Lake Michigan through a cooperative, basin-wide approach. Partners include local governments, special purpose districts, non-profits, residents and representatives of business and academia. Sweet Water's goal is to make measureable progress toward improving the region's waters by supporting land use practices and designs that improve water resources, forging relationships to assist in projects offering lasting benefits and cost savings, and completing cost-effective projects that yield measurable water quality improvements. Early Sweet Water successes include completion of watershed restoration plans for the Kinnickinnic and Menomonee Rivers (now being used to guide efforts in those two watersheds), securing of a 2011 EPA grant to create a watershed-based stormwater permit for the Menomonee River municipalities (one of just 3 EPA national pilot projects), and the creation and funding of both a green infrastructure mini-grant program and a new regional storm water education program. This presentation will discuss the challenges of creating and sustaining a cross-sectoral regional environmental collaborative, and will offer key lessons in watershed-wide environmental planning and implementation.

Biologists Without Borders in Action, Thursday, February 23, Maple Lawn C, 11:40 am - 12:00 noon

Matthews, Jeffrey, Illinois Natural History Survey, University of Illinois

Obstacles to defining and achieving success in compensatory wetland mitigation

Compensatory wetland mitigation would be a more straightforward process if there were some simple way sto estimate the likelihood of success of a proposed mitigation project. Data compiled from over 60 restored wetlands across Illinois highlight the difficulty in achieving restoration targets, the unpredictably of restoration outcomes, and the subjectivity inherent in any assessment of restoration success. A comparison of restored wetlands, natural reference wetlands, and legally binding performance standards established by the Army Corps of Engineers revealed that although some performance standards were reasonably achievable, others, such as establishing a minimum cover by native, perennial plants, were rarely met. Furthermore, although vegetation-based indicators in restored wetlands were equivalent to those in randomly-selected natural wetlands, restored wetlands did not achieve equivalence with high quality reference wetlands. Therefore, judgment of success depends on the particular indicator of restoration progress we choose to measure and the standards we establish as restoration targets. Even after a particular restoration goal is settled upon, restoration progress is context-dependent and difficult to predict. Data from restored wetlands suggested that certain restoration goals were unachievable in the present-day Midwestern landscape. Major constraints on wetland restoration progress included landscape degradation, disturbance events such as floods, and non-native species invasion. Wetland restoration is not a simple developmental process, and compensatory mitigation cannot be relied upon to rapidly and invariably replace destroyed natural wetlands. However, with relevant information about a proposed project site and its setting, we may be able to predict whether a restoration goal is realistically achievable.

Wetland Restoration Techniques, Wednesday, February 22, Maple Lawn C, 10:40 - 11:00 am

Maurer, Debbie, Lake County Forest Preserve District

Strategies for invasive plant management in the Chiwaukee Illinois Beach Lake Plain

In 2010, the Lake County Forest Preserve District, in partnership with the Illinois Department of Natural Resources, WDNR, The Nature Conservancy, UW-Parkside, Village of Pleasant Prairie, Johns-Manville Corporation, and Illinois State Geological Survey, received a Sustain Our Great Lakes grant to address the control and management of a common set of invasive plants species across property boundaries and to hire a 2-year invasive plant strike team to help contain and eliminate early detection invasive plant populations. Prior to this project, similar work at a smaller scale had been successfully implimented at Spring Bluff Forest Preserve. Topics to be discussed include: 1) methods for control of invasive cattails in high quality communities and in areas with varying densities of cattails, the logistics of implementation of a strike team across multiple property owners, and the importance of a landscape scale approach to invasive plant control and habitat conservation to maximize restoration outcomes.

Biologists Without Borders in Action, Thursday, February 23, Maple Lawn C, 11:00 - 11:20 am

McLeester, Madeleine, University of Chicago

Valuing wetlands: An archaeological perspective on the past and present use of wetlands

While it may not seem immediately obvious, wetlands hold key data that can help us investigate prehistoric and protohistoric indigenous communities. Urban wetlands, in particular, provide small pockets for investigation in an otherwise paved, filled, dredged, or built upon landscape. In this paper, I explore the heritage of urban wetlands and discuss the potential and difficulty of archaeological investigation in an urban setting, the Calumet Region. The Calumet Region, located along the southern rim of Lake Michigan, once hosted one of the largest stretches of wetlands in the United States. Prior to extensive European settlement and industrialization of the region, these wetlands played a key role in indigenous communities who used them for hunting, plant collection, and agriculture. However, with arrival of Europeans in the late 1600s and dominance of the industrial sector by the 1800s, land use strategies changed and wetland areas were subsequently severely reduced. For example, in Illinois, wetland areas have been reduced by approximately 95% (Greenberg 2002: 116). The extent and rapidity of wetland destruction coincided with the historic devaluing of wetlands. However, as this conference attests, wetlands are again being valued, protected, and restored. In this presentation, I will discuss how integrating an archaeological and historical understanding and methods (like pollen analysis) to the study of wetlands not only preserves wetland heritage, but also aids restoration goals, notably biodiversity.

History as a Factor in Wetland Restoration, Wednesday, February 22, Maple Lawn A, 2:00 - 2:20 pm

Melchior, Martin, Inter-Fluve

Eel River: A model for the restoration of retired cranberry bogs

Plymouth, Massachusetts is home to over 500 cranberry bogs, some of which have been retired for economic or ecological reasons. Traditional cranberry bog retirement did not involve restoration to any planned spatial or temporal targets, but involved only removal of water control structures and passive means. The Eel River complex, a 40 acre cranberry bog south of Plymouth, was retired in 2005. Research for the restoration project included a study of groundwater fluctuation, temperature, pH, conductivity, contamination and macrofossil identification of peat cores. Designs were developed to restore the site to a combination of community types including cedar swamp, red maple swamp and shrub dominated minerotrophic fen. The project was built in 2009 and included custom seed collection and propagation of Atlantic white cedar, 8,000 feet of restored stream channel, wildlife passage culverts, microtopography excavation, raptor perches, off-channel fish habitat, a dam removal and the installation of over 1400 pieces of large woody debris. The project received the 2011 Coastal America Partnership Award presented by the Secretary of the Interior. In this talk, the author examines the scientific basis for design, design and construction challenges, and the pros and cons of each step in the approach. Massachusetts and Wisconsin lead the world in cranberry cultivation, and this approach offers an economical way of restoring a facsimile of pre-settlement bog form and function to retired cranberry bogs.

Wetland Restoration Techniques, Wednesday, February 22, Maple Lawn C, 11:20 - 11:40 am

Mengler, Jeffrey, Chicago Wilderness & Cardno ENTRIX

The Chicago Wilderness Green Infrastructure Vision

We all understand the challenges of striving to maximize our conservation impact using limited resources. It is imperative that we conduct our work at multiple spatial scales (e.g. site, community, landscape) to ensure that the results from our efforts extend beyond the boundaries of our individual areas of geographic focus and are synergistically aligned with other conservation initiatives. Landscape scale conservation using a green infrastructure approach is the emerging framework for the conservation community. By integrating land protection efforts into a broader green infrastructure network, we help to ensure the long-term health and resiliency of the lands we protect in the face of increased stressors such as climate change and surrounding land-use changes. Chicago Wilderness (CW) is an alliance of over 250 diverse organizations dedicated to biodiversity conservation in the Chicagoland area established in 1996. In 2004, CW developed a Green Infrastructure Vision (GIV) for the multi-state Chicago metropolitan landscape with the goal of protecting 1.8 million acres by 2060. Since that time, the alliance has worked to turn that vision into an on-the-ground reality through a number of innovative initiatives that includes technical outreach to municipalities through the Sustainable Watershed Action Team (SWAT) program. Most recently, CW has embarked on a refinement process called GIV 2.0 that will bring the 2004 product up to date, allow easier dynamic updates in the future, and provide a more robust scientific basis for the green infrastructure plan.

Biologists Without Borders: Ideas & Plans, Thursday, February 23, Maple Lawn C, 9:50 - 10:10 am

Miller, Jeffrey, UW-Madison
Steven P. Loheide, UW-Madison

Explaining the differences in urban stormwater flow attenuation capabilities between adjacent constructed wetland swales

Constructed wetlands in urban environments could potentially improve stormwater treatment infrastructure while providing other ecosystem services for urban areas, such as natural beauty and biodiversity. However, the high soil moisture found in wetlands limits their use as infiltration basins. Identifying management techniques to promote stormwater infiltration, volume reduction, and flow attenuation is an important step towards including wetlands in our stormwater infrastructure. As part of an ongoing project to evaluate the stormwater treatment potential of wetlands, we are monitoring stormwater flows through four adjacent, recently constructed wetland swales to identify factors that can promote stormwater volume reduction. The swales receive stormwater from a sewer system that serves a mixed residential and commercial catchment in Madison, WI. Between mid August and the end of October, all four of the swales attenuated peak stormwater flow rates, but they differed systematically in their ability to reduce flow volumes by infiltrating or storing the water during storms. Here we identify and evaluate possible explanations for the observed differences in stormwater volume reduction. We compare the swales in terms of results of vegetation surveys and infiltration tests conducted in summer 2011. The implications of differences in bathymetry are also considered. The results of this work will be used to improve the management of the stormwater treatment swales for the upcoming season and will inform design guidelines for constructing wetlands as stormwater treatment facilities.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Miller, Nick, The Nature Conservancy
Tom Bernthal, WDNR
John Wagner, The Nature Conservancy
Mike Grimm, The Nature Conservancy
Gary Casper, UW-Milwaukee Field Station
Rebecca Graser, USACE

Thinking like a watershed: A framework to align wetland mitigation actions and watershed conservation priorities

Along the wetland-rich west shore of Green Bay, a diverse group of partners in the Duck-Pensaukee watershed developed methods to locate and prioritize aquatic restoration and protection opportunities. Opportunities were mapped using a combination of wetland and soils data. Watershed goals were set based on an assessment of historic vs. current wetland functions (e.g., flood abatement, water quality maintenance). Individual sites were then prioritized according to their relative potential to contribute to watershed functional goals. This framework builds from methods developed throughout the Great Lakes region and addresses statewide priorities (e.g., Wildlife Action Plan), wetland regulatory concerns, and local watershed conservation goals. Partners include The Nature Conservancy, Environmental Law Institute, WDNR, St. Paul District of the Army Corps of Engineers, and other local, state, tribal, and federal conservation interests. While results will be applied locally, this project also provides Great Lakes coastal representation within a suite of pilot projects nationwide to develop a formalized "watershed approach" for compensatory mitigation under the Clean Water Act §404 Program. The aims of this larger project are to improve the integration of ecological information and proactive planning into the mitigation site selection process, and to align §404 mitigation actions with local, watershed-specific conservation priorities. With $2.9 billion spent annually, nationwide, on compensatory mitigation, the "watershed approach" presents a major opportunity to advance watershed health by establishing priorities for regulatory compensatory mitigation in a manner that complements and bolsters non-regulatory efforts.

Strategies for Prioritizing Restoration, Wednesday, February 22, Maple Lawn C, 1:20 - 1:40 pm

Montgomery, James, DePaul University
J. Marshall Eames, Loyola University Chicago

Phosphorus release from a restored farmed wetland in northeastern Illinois

In northeastern Illinois, restored wetlands have been used to improve water quality in streams degraded by agriculture and urban development. The effectiveness of restored freshwater wetlands in reducing nitrogen in waterways is well documented; however, fewer studies address their effectiveness in removing phosphorous, despite the fact that phosphorus is frequently the limiting nutrient in these systems. Since 1998, we have conducted systematic water quality monitoring at Prairie Wolf Slough Wetland Demonstration Project (PWS), a restored palustrine emergent wetland located on abandoned farm fields adjacent to the Chicago River in Lake County, Illinois. Our objectives are to assess long-term spatial and temporal variations in soluble reactive (SRP) and total phosphorous (TP) and compute a mass balance and retention efficiency for these constituents. Water samples regularly are collected from five sites, including a swale carrying urban stormwater runoff into PWS, and the wetland's outlet to the Chicago River. Water quality and flow data indicate that the restored wetland acts as a point source of SRP and TP reaching the Chicago River. Long-term mean SRP and TP concentrations increased 279% between the inlet and outlet. Soil testing and analysis of phosphorus release from decaying vegetation suggest that net phosphorous export was likely due to exposure of P-laden sediment to anoxic conditions during flood events. Weekly synoptic sampling in 2008-2009 confirm these results and demonstrate the need for including both soil and water quality testing into wetland restoration planning, design and monitoring protocols.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Parker, Eric, Stantec Consulting Services, Inc.

Recognizing and understanding natural area remnants in urban wetland systems

Which wetlands are worthy of the most protection? As a practicing wetland scientist in the Midwest for over 25 years who has seen thousands of wetlands, many urban, I often ask myself that question. While much of the information in this presentation is anecdotal, my hope is to provoke thoughts in the audience on which wetland systems may deserve our highest attention. While plant communities within wetlands and their buffers are the focus of this presentation, by no means should it be construed that other wetland functions are not valuable factors as well. This presentation is limited to a perspective that will help determine the quality of the wetland. Our region of the Midwest, as with most areas of the United States, co-evolved with us these past few hundred years to the point where remnant wetlands are becoming rare, especially in urban settings. Our intervention with not only the soils, plants and animals, but also natural processes such as fire, disease, drought and flooding has favored some species over others. This has degraded wetlands, but to an extent that most can be restored. However our remnant wetland systems, including some that remain unrecognized on private land, continue to this day to possess at least some of their original diversity and the underlying microscopic elements that support that diversity. These wetland systems cannot be recreated. Although remnant wetlands can be identified and valuated in many ways, the fastest way is to review them for the presence of conservative plant species.

Strategies for Prioritizing Restoration, Wednesday, February 22, Maple Lawn C, 1:00 - 1:20 pm

Parker, Eric, Stantec Consulting Services, Inc.

Potentially mis-categorized wetland plant species of the NE-NC and Midwest Land Resource Regions of the U.S.

The U.S. Army Corps of Engineers (USACE) is overseeing the process of reviewing the National Wetland Plant List (NWPL - Federal Register Vol. 76, No. 4; January 6, 2011). Tasks have included revising definitions of indicator categories, updating nomenclature, and dropping the +/- symbols. The Final NWPL has not yet been published by the USACE, but is expected to be in 2012. From January 6, 2011, to March 21, 2011, wetland scientists across the country were invited to register on the national database and provide their opinions to be considered in the process. Because complete, germane scientific data does not exist for species given the large geographic context of each land resource region, indicator categories of species must be determined by polling experienced field botanists and wetland scientists who each have the perspective of viewing thousands of wetland plant communities over many years. While many scientists agree most species have been appropriately categorized, some remain questionable by field practitioners. Recognizing that some species may be mis-categorized, Stantec polled our internal and external (collegial) wetland scientists to determine consensus opinions. Our focus was limited to common species frequently encountered in wetland determinations. In the Northcentral-Northeast Land Resource Region (LRR), 89 species were initially identified as potentially mis-categorized, while in the Midwest LRR, 62 species were identified. We will present our consensus results in this poster. Our intent is that these results will promote discussions that lead to the establishment of appropriate final indicator statuses of the evaluated species.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Patti, Heather, RA Smith National, Inc.
Alice Thompson, Thompson & Associates Wetland Services

Control effort summaries for hairy willow herb and reed manna grass in Racine County, WI

Hairy willow herb (*Epilobium hirsutum*) was found in 2008 at Carre-Hogle Park in Racine, Wisconsin. Hairy willow herb is a Eurasian relative of the native fireweed that can aggressively invade wetlands and shorelines. In 2010, a WDNR Aquatic Invasive Species grant was received to begin control activities. During the summer and fall of 2010 and 2011, all viable stems were treated with a 2.5-3% Glyphosate solution (Roundup™) using backpack sprayers. Most of the population was eradicated after 2 treatments in 2010, but some re-sprout was observed in 2011 and re-treated. By the end of the 2011 growing season, no viable stems were present. We will be re-visiting the area in 2012 to confirm that the Glyphosate treatments successfully eradicated this population. Reed manna grass (*Glyceria maxima*) is a perennial, rhizomatous grass that can form dense, impenetrable stands along riparian corridors. An established population of reed manna grass was first observed along the Pike River in Mount Pleasant in 2005. In 2011, a WDNR Aquatic Invasive Species grant was received to monitor the effects of two herbicides on control of this species. The study design is a split plot design with replications of Aquaneat® & Habitat® herbicide. Although this is a two-year study, we are reporting preliminary results from the 2011 herbicide treatments. To date, we have observed successful die-off using both herbicides, but in some plots re-sprouting is likely to occur. The Habitat® herbicide caused a heavier die-off of the *Glyceria*, and impacted several native species growing in the plots.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Powell, Ken, MN Board of Water & Soil Resources
Jason Naber, Emmons & Olivier Resources, Inc.

On the edge: Assessing vegetation for wetland delineation purposes in diverse urban wetlands in Minnesota

Determining the hydrophytic status of vegetation is essential for delineating wetlands in accordance with the 1987 Corps of Engineers Wetland Delineation Manual and applicable supplements. Past studies have shown some statistical bias in approved assessment methods. Recent studies have used simulated plot data, while others used data from plots that were not specifically situated in difficult wetland-upland transition areas where vegetation assessment is most critical to wetland delineations. In addition, there is little data on the effect of time of year on vegetation assessment in wetland transitional areas. This ongoing, small-scale study was initiated to characterize and document the use of wetland delineation vegetation assessment techniques in diverse, urban wetland transition areas typically encountered when conducting wetland delineations. Data from seven different sampling plots were gathered monthly during the 2010 and 2011 growing seasons. Data analysis indicates a strong influence of time of year on hydrophytic assessment outcomes. A comparison of different assessment methodologies will also be presented along with an analysis of the specific causes of variation in methods and timing. Information from this study will provide much needed data and analysis of vegetation assessment for practical wetland delineation purposes.

Approaches to Wetland Mapping and Assessment, Wednesday, February 22, Maple Lawn B, 1:40 - 2:00 pm

Prellwitz, Stephanie, UW-Madison
Anita Thompson, UW-Madison

Soil stability and water quality within wetland treatment swales for urban runoff

Constructed wetlands can be utilized to treat and filter stormwater runoff through microbial uptake processes and by storing and filtering pollutants. In urban areas, these wetlands are often composed of invasive monocultures that offer limited ecological function. The ability of diverse native wetland vegetation to improve water quality, to stabilize soil, and to prevent erosion and resuspension of deposited sediment remains understudied, particularly in constructed wetlands designed to treat urban runoff. In this study we evaluate water quality treatment and soil stability in wetland treatment swales within a stormwater management facility at the University of Wisconsin-Madison Arboretum. This ongoing study is one component of a larger study aimed at testing relationships between native vegetation diversity, engineered hydroperiods, and a range of ecosystem services over multiple growing seasons. Four wetland treatment swales receive stormwater from a mixed residential and commercial watershed and are subjected to low-, high-, or fluctuating-hydroperiods. Plots within each swale vary in vegetation diversity and are surveyed annually for species presence and biomass. To evaluate soil stability, a cohesive strength meter was used to measure critical shear stress within the swales. Automated ISCO water samplers collected stormwater samples upstream and downstream of each swale throughout the runoff hydrograph for select storms in the fall of 2011. Samples were analyzed for nitrogen, phosphorus, and sediment concentrations. Critical shear stress and nutrient/sediment removal will be related to data obtained from vegetation surveys and hydroperiod regimes. Our results will be used to guide recommendations for constructed wetland treatment in urban applications.

Stormwater Management and Wetlands, Thursday, February 23, Maple Lawn A, 9:30 - 9:50 am

Quartucci, Gregory, Cardno JFNew

Indiana toll road mitigation and urban restoration in Gary, Indiana

To accommodate increases in traffic capacity and improve vehicle transportation on I-90 in Gary, Indiana, the Indiana Toll Road Concession Company retained the Indiana Toll Road Contractors (ITRC) to improve the Indiana Toll Road, including roadway widening. The project area lies in a part of Gary, Indiana, that is relatively rich in natural resources, including several nature preserves, wet prairies, and dune and swale wetland complexes. While most wetland impacts were avoided, impacts to just over one acre of low-quality wetlands in roadside swales and ditches did occur. The ITRC and ITRCC developed a mitigation plan with Cardno JFNew. Rather than replace the impacted roadside swales and ditches, the restoration team developed a strategy to maximize wetland mitigation value by conserving and adding to urban biodiversity. Through collaboration with federal and state agencies and local environmental groups, the team developed an urban-focused mitigation plan, including restoration of one acre of globally threatened dune and swale habitat in Gary's urban core, restoration and preservation of a high quality prairie, and purchase of 1.5 acres of wet prairie from the Lake Station Wetland Bank. The proposed dune and swale restoration site is adjacent to the Ivanhoe Nature Preserve, located directly south of the project area. The project restoration and first year monitoring was completed in 2011. The presentation will focus on how this mitigation approach was developed and the lessons learned and challenges faced in the first year. Natural restoration and maintenance techniques will also be addressed.

Wetland Restoration Case Studies, Thursday, February 23, Maple Lawn A, 11:40 am - 12:00 noon

Rogner, John, Illinois DNR

Millennium Reserve Calumet: Reinvesting in the ecology, culture and economy of the Calumet Region

The Calumet region of southeast metropolitan Chicago is one of the largest undervalued and untapped expanses of land and idle industrial infrastructure in the US. It also contains some of the most important ecological resources found in the Great Lakes region, including wetlands. The Calumet region can benefit from a new way of envisioning the future for this important place. Millennium Reserve will focus on open space and natural area protection and restoration but will also be a catalyst to promote economic growth by providing a framework to leverage existing resources in partnership with dozens of government agencies, community groups, and advocacy organizations. The project builds on over three decades of work by Calumet area residents, the City of Chicago, and the State of Illinois. The Millennium Reserve initiative is part of President Obama's America's Great Outdoors initiative to re-connect Americans to America's rich outdoor treasures; build upon public, private and tribal priorities for conservation and recreation lands; and use science-based management practices to restore and protect our lands and waters for future generations.

Biologists Without Borders: Ideas & Plans, Thursday, February 23, Maple Lawn C, 10:10 - 10:30 am

Rossler, Shawn, WDNR
John F. Olson, WDNR

Status of Wisconsin's Beaver Management Plan

In the 1980's, a multidisciplinary team was assembled to provide a balanced approach to address increased beaver numbers, pressing beaver problems, and long-term management of the species which lead to a 1990 Beaver Management Plan. Management actions and methods used by managers under the 1990 plan lead to a significant decrease in the beaver population in northern management zones. Recent concern from public user groups, and results from beaver helicopter surveys, suggest that the management actions may have gone too far to reduce beaver populations. Citizen concerns and population trends resulted in the assembly of a Beaver Task Force in July, 2011. The Task Force membership includes representatives from the WDNR, USDA Wildlife Services, US Forest Service, County Forest Association, County Highway Departments, Towns Association, Trout Unlimited, Great Lakes Indian Fish and Wildlife Commission, Wisconsin Trappers Association, Wisconsin Wildlife Federation, Forest County Potawatomi, and Bad River Bands. The Task Force is charged with developing recommendations for an updated beaver management plan that uses the latest available peer-reviewed science in combination with in-depth citizen input, and strives for reasonable balance, protects core beaver populations, addresses conflict, supports aggressive damage control and recommends solutions and identifies future needs. A series of public informational meetings were held in September 2011 and an online survey was developed to seek citizen input. We'll cover a brief summary of public input, progress and recommendations made by the Task Force, and what is planned for the future.

Management Planning for Wetlands, Wednesday, February 22, Maple Lawn B, 11:00 - 11:20 am

Rossler, Shawn, WDNR
John F. Olson, WDNR
Dave MacFarland, WDNR

Status of beaver in Wisconsin

Beaver are deeply rooted in Wisconsin history and were abundant throughout the region prior to European settlement and the fur trade. Habitat changes and unregulated trapping into the 1900's reduced beaver populations to near extinction levels. Through protections and recovered habitats, beaver populations increased rapidly during the 1950's and 1960's, peaking near 220,000 animals in the mid 1980's. Beaver harvest estimates, once based on mandatory registration, were discontinued in the mid-1980s and replaced with a mail questionnaire. A few years later several rules changed, including allowing landowners to control beaver causing damage without permits. Without registration and without knowledge of damage levels, the ability to accurately estimate the population diminished. In an effort to more accurately estimate populations, Wildlife Research (Bruce Kohn), developed the current, highly accurate aerial survey protocol used to estimate populations in northern management zones. The statewide beaver population estimate from flight surveys in 2008 was 66,800. Aerial surveys were conducted in late October 2011 and population estimates will be presented.

Habitat Needs for Wetland Wildlife 1, Thursday, February 23, Maple Lawn B, 9:30 - 9:50 am

Roth, Joseph, Openlands
Thomas Slowinski, V3 Companies, Ltd.

Remeandering/relocating approximately 3 miles of Spring Creek through Hadley Valley Preserve (IL)

Will County, which is located southwest of Chicago, Illinois, is one the most rapidly urbanizing counties in the Midwest. The Spring Creek Greenway holdings of the Forest Preserve District of Will County (FPDWC) consist of approximately 1,925 acres over the 8-mile stream corridor. Hadley Valley Preserve (658 acres) is one of 4 preserve systems within the Greenway. The FPDWC, in conjunction with the Illinois State Toll Highway Authority, U.S. Army Corps of Engineers, Openlands, and V3 Companies, are in the process of restoring over 500 acres at Hadley Valley Preserve to native plant communities. Included in this is restoring hydrology to approximately 150 acres of former wetlands by disabling drainage tile and lowering the grade of sections of Spring Creek. Wetland habitats restored as a part of the initiative include emergent wetland, sedge meadow, wet prairie, and flood plain forest. A major element of the Hadley Valley restoration effort is the relocating of nearly 3 miles of incised Spring Creek to its former meandering course. Relocation of the creek channel has added approximately 2,000 feet to Spring Creek within Hadley Valley Preserve. The presentation will focus on the investigation, planning, and construction behind the remeandering, the role of the remeandering in the restoration of wetlands, how engineers and ecologists worked together in the Design-Build process, and what the results of the vegetative and aquatic monitoring have been since 2008.

Wetland Restoration Case Studies, Thursday, February 23, Maple Lawn A, 11:20 - 11:40 am

Salas, Dan, Cardno JFNew

Habitat management planning with the USFWS along large riverine systems of the Midwest

Cardno JFNew has been assisting the U.S. Fish and Wildlife Service in development of habitat management plans for several refuges located along some of the large riverine systems throughout the Midwest. Habitat management plans have been (or are in the process of development) for refuges located along the Illinois, and Mississippi Rivers. Planning along these large riverine system poses a unique opportunity to have a positive impact on the future habitat available for species of conservation concern. Riverine systems such as these pose a series of complexities involving flooding, invasive species, accessibility, and conflicting management needs. To address these concerns, the U.S. Fish and Wildlife Service has required all refuges within the National Wildlife Refuge System to complete habitat management plans to address how the refuge will manage these habitats into the future. This session will discuss the aspects of planning for habitat management and conservation at these large sites. We will discuss considerations such as resource management planning, regional conservation needs, and identification and prioritization of focal resources and their management. We will also share how some of these efforts were documented in the final habitat management plans.

Management Planning for Wetlands, Wednesday, February 22, Maple Lawn B, 10:40 - 11:00 am

Salas, Dan, Cardno JFNew

Eco-engineering on the edge: Stream restoration, stabilization, and evaluation of risk and alternatives

When protecting infrastructure such as gas pipelines, sewer lines, driveways, and property along streams, an ecologically-sensitive stabilization or restoration approach can often achieve a combination of ecological and engineering concerns. In this presentation, we will compare traditional hard structure methods with alternative methods that have higher ecological value, discuss when and where an ecological approaches will work best, limitations to this approach, and key considerations to make in design and implementation. In doing so, we will review decision analysis tools that aid in selecting the most beneficial approach for a particular scenario and highlight examples of successful projects in the Midwest and elsewhere that have implemented such alternatives, including using large woody structure and flow re-directive measures.

Wetland Restoration Case Studies, Thursday, February 23, Maple Lawn A, 11:00 - 11:20 am

Scherer, Reed, Northern Illinois University
Michael Konen, Northern Illinois University
Barbara Winsborough, Winsborough Consulting
Eric Carlson, WI Geological & Nat. Hist. Survey
Joe Mason, UW-Madison

Marine diatoms in upper Midwest wetlands? Yes, it's true!

Late Cretaceous marine diatoms have been discovered in wetland basins from Southeastern Minnesota to southern Wisconsin and northern Illinois. Were did they come from? How did they get into these lacustrine and peatland deposits? What do they tell us about Late Pleistocene conditions and wetland environments? Their provenance must be from the Pierre Shale sedimentary deposits from the Late Cretaceous Western Interior Seaway, however, no diatom-rich Pierre Shale deposits are known to exist in situ. The original deposits must now be deeply buried, or have been destroyed by the advancing Laurentide Ice Sheet. A survey of late Pleistocene tills has revealed the exclusive occurrence of these diatoms in Des Moines Lobe moraines, providing evidence that the original siliceous deposits were locally overridden and buried or destroyed. How they got to wetlands far from their source is revealed by particle size analysis, which identifies them as having been carried by powerful winds across the plain as the glaciers retreated. Vast glacial outwash deposits of silt-sized particles would provide a ready source of diatom-rich loess near the Des Moines Lobe terminal moraine. The diatoms were carried eastward by strong westerly winds, and deposited in wetlands proximal to the Michigan and Green Bay lobes of the retreating Laurentide Ice Sheet. Given the limited source beds and distinct signature of these diatoms, their distribution and concentration in certain wetland deposits provides a tracer of wind direction and intensity during the postglacial phase, refining current knowledge of Late Pleistocene climatic and atmospheric conditions.

History as a Factor in Wetland Restoration, Wednesday, February 22, Maple Lawn A, 2:20 - 2:40 pm

Schwartz, Carl, Bird City Wisconsin
Noel Cutright, We Energies

Bird City Wisconsin: 39 communities win recognition for protecting urban wetlands and their inhabitants

Bird City Wisconsin, a growing coalition of citizens, public officials and organizations, led by the Milwaukee Audubon Society, the Natural Resources Foundation of Wisconsin and the Wisconsin Bird Conservation Initiative, wants to ensure that folks living in Wisconsin communities maintain healthy populations of birds and appreciate them. In its first year, it has recognized 39 communities in a program modeled on Tree City USA. Communities, whether they are towns, villages, cities or counties, which come together to help protect birds using a variety of conservation activities, will be designated as a Bird City. The program offers high-profile public recognition to communities that meet at least 7 of 22 criteria for creating/protecting bird habitat, fostering conservation education, taking steps to protect birds from perils, and recognizing International Migratory Bird Day. Urban wetlands have emerged as a key part of the program's habitat component since they are critically important for songbirds, shorebirds, waterfowl and wading birds. Bird City stresses the economic incentive to practice conservation. EPA places the value derived from observing and photographing wetland birds at $10 billion a year. Communities earning Bird City recognition have cited wetland restorations that have created successful breeding habitat for Wood Ducks, Forster's Terns and Osprey. Bird City is forging partnerships with the WDNR and the Department of Tourism, and aims to double the number of recognized communities over the next year. See website: www.birdcitywisconsin.org for details.

Involving the Human Community, Wednesday, February 22, Maple Lawn B, 4:10 - 4:30 pm

Shackelford, Penelope, Fair Meadows SNA
Gary D. Shackelford, Fair Meadows SNA
Chris Kaplan, Tallgrass Restoration, LLC

Comparison of herbicide efficacy and damage to non-target plants in a SE Wisconsin sedge meadow

Cattail (*Typha angustifolia* and *T. glauca*) have been increasing in a sedge meadow at the Fair Meadows State Natural Area in SE Wisconsin over the past 10 years. It now forms a near mono-culture in some areas. We decided to assess the efficacy of various herbicide treatments. We also wanted to minimize collateral damage to the native plant community. In mid-fall, when cattails were less than 10% brown at the tips but many native species were dormant, four test areas (33 x 15 feet) were treated as follows: A 2% Clearcast (CC), B 1% Habitat (Hab), C 5% AquaNeat (aquatic glyphosate) (Gly), and D (control) 1% MSO. All herbicides had 1% MSO (surfactant) and 0.8% Request (conditioning agent). Two-foot swaths were cut between treatment areas. These were used as access lanes for spraying and also were used to test stem-treatment with each of the test herbicides (10% CC, 8% Hab, 10% Gly). Stem count of cattails (7/11/2011) showed equivalence of the 3 herbicides: 44 CC, 20 Hab, 31 Gly, 1309 Control. Cut-stem treatment results were also similar: 17 CC, 27 Hab, 36 Gly. Survey of native species on 8/24/2011 showed *Pilea pumila*, *Bidens sp*., *Erechtites hieracifolia*, *Eupatorium purpureum* and *Aster sp*. in all treatment areas. More *Solidago gigantea* was present in the control area and in the Hab and Gly areas. Sedges were seen only in the Gly area, but they had been suppressed throughout before the study. Further assessment of recovery will require longer follow-up.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Simpson, Thomas, McHenry Co. Conservation Dist.
Greg Rajsky, Small Waters Education

A weekend of restoration: Restoring a wetland and building community

Restoring a wetland provides habitat for native plants and animals and increases the water-storage capacity of a landscape, but we seldom think of it as a method of enlightening people and building a human community. On September 23-25, 2011, McHenry County Conservation District (MCCD) hosted a three-day restoration event billed as "A Vacation that Makes a Difference." Seventeen people participated in the event, plus a team of five graduate students from the University of Michigan. Participants learned about wetland history, plants, hydrology, and soils and listened to a panel discussion on climate change and ecological restoration. They shared their learning experiences, their meals, and their work. The event took place in Glacial Park, a 3,500-acre natural area in northeast McHenry County, and activities focused on a 0.7-acre wetland basin filled with agricultural sediment. Three weeks prior to the event, MCCD excavated 3,000 tons of sediment and prepared the basin for planting and seeding. Participants seeded a diverse mix of native plants and then planted over 300 plugs. A three-inch rain drenched the county on Sunday night after the event, and on Monday morning the basin held a pool of water for the first time in many decades. Several participants continue to visit the site and communicate their observations via email to the rest of the team. MCCD has plans to start a Facebook page for this and future events to foster the sense of community and connection to place that develops through such immersion experiences.

Involving the Human Community, Wednesday, February 22, Maple Lawn B, 3:30 - 3:50 pm

Sloss, Brian, U.S. Geological Survey
Rori A. Paloski, WDNR
Gregor W. Schuurman, WDNR
Owen D. Boyle, WDNR
Joshua M. Kapfer, UW-Whitewater

Genetic integrity and hybridization of Wisconsin gartersnakes

Butler's Gartersnake (*Thamnophis butleri*; BGS) have recently been proposed for delisting as a state threatened species by WDNR. The species relies on rare open-canopy wetlands with connected upland open-canopy habitat. Previous research questioned the genetic integrity of the species in conjunction with suspected hybridization between BGS and the closely related Plains Gartersnake (*T. radix*; PGS). Our objectives were to (1) determine if distinct genetic differences exist between BGS and PGS, and (2) determine if data exist consistent with hybridization between the species in Wisconsin. Snakes from various Midwestern locations were sampled with the majority (n = 741) from Wisconsin. Genetic data was collected for each specimen at 16 microsatellite loci. The number of genetic units in the composite data set was predicted using a Bayesian method employed in the program STRUCTURE. In addition, the percent composition of an individual's genotype belonging to any given genetic group was predicted. Three genetic units were identified in the Wisconsin samples correlating to species groups of BGS, PGS, and Common Gartersnake (*T. sirtalis*). These data were sufficient to confirm the presence of genetic differences between WI BGS and WI PGS. A majority of WI snakes (94.2%) were identified as one of the three species at a threshold of ≥80%. The remaining 43 snakes were considered putative hybrids with 26 consistent with hybrid status using a 70:30 threshold. This study provides evidence of species integrity, occurrence of natural hybridization, and a potential method of future sample identification.

Habitat Needs for Wetland Wildlife 1, Thursday, February 23, Maple Lawn B, 10:10 - 10:30 am

Slowinski, Thomas, V3 Companies, Ltd.
Joseph Roth, Openlands

Remeandering/relocating approximately three miles of Spring Creek through Hadley Valley Preserve

Will County, which is located southwest of Chicago, Illinois, is one the most rapidly urbanizing counties in the Midwest. The Spring Creek Greenway holdings of the Forest Preserve District of Will County (FPDWC) consist of approximately 1,925 acres over the 8-mile stream corridor. Hadley Valley Preserve (658 acres) is one of 4 preserve systems within the Greenway. The FPDWC, in conjunction with the Illinois State Toll Highway Authority, U.S. Army Corps of Engineers, Openlands, and V3 Companies, are in the process of restoring over 500 acres at Hadley Valley Preserve to native plant communities. Included in this is restoring hydrology to approximately 150 acres of former wetlands by disabling drainage tile and lowering the grade of sections of Spring Creek. Wetland habitats restored as a part of the initiative include emergent wetland, sedge meadow, wet prairie, and flood plain forest. A major element of the Hadley Valley restoration effort is the relocating of nearly 3 miles of incised Spring Creek to its former meandering course. Relocation of the creek channel has added approximately 2,000 feet to Spring Creek within Hadley Valley Preserve. The presentation will focus on the investigation, planning, and construction behind the remeandering, the role of the remeandering in the restoration of wetlands, how engineers and ecologists worked together in the Design-Build process, and what the results of the vegetative and aquatic monitoring have been since 2008.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Smith, Christopher, WDNR
Tom Bernthal, WDNR

Potentially Restorable Wetlands Version 2.1: A revised methodology for finding potentially restorable wetlands

Two years ago the WDNR improved its process to determine locations of Potentially Restorable Wetlands (PRWs). PRW version 2.1 is a more efficient process that has enabled WDNR to map the entire state, except for 8 counties where the digital wetland inventory is not available. In addition to finding possible restoration sites, the PRW data can be used to estimate the extent of original wetlands and thus the amount and percentage of wetlands lost per watershed, county or other region of interest. Version 2.1 builds on the previous PRW model, but provides a better solution to the issues of how to treat urban lands, set polygon size thresholds, and treat soils with hydric inclusions. It also allows for easier updates to the layer based on new restoration work, allowing it to become a better tool for use in watershed analysis and restoration siting. This talk summarizes the changes made in the model, presents a status report on completed watersheds and counties, and presents caveats on using PRW data.

Strategies for Prioritizing Restoration, Wednesday, February 22, Maple Lawn C, 2:00 - 2:20 pm

Smith, S. Galen, UW-Whitewater
Mary Linton, Snapping Linton Ecology
Alice Thompson, Thompson & Associates Wetland Services

***Typha domingensis* (Southern cattail) new to Wisconsin**

Typha ranges worldwide, with about 15–17 species and the center of diversity in eastern Asia. *Typha domingensis*, in the U.S. called Southern cattail, is pantropic, ranging north and south to about 40 deg. latitude. In 2011, we found many colonies in Middleton, Wisconsin, in disturbed marshes near parking lots and streets, with *Typha latifolia*, *T. angustifolia* and *T. Xglauca* (=*T. angustifolia* x *T. lattifolia*). It was probably brought to Middleton as seeds by wind, birds, or humans, perhaps on construction equipment, and established within the past few years when the areas were developed. The many mature spikes bear numerous seeds. It may be distinguished from *T. angustifolia* by brown punctate mucilage glands on the leaf blade bases and pale pistillate bracteole tips. It is variable worldwide; the Wisconsin plants are atypical in their uniformly colorless fruit-hair tips. Elsewhere in the U.S. it sometimes forms mostly fertile *T. angistifolia* x *domingensis* hybrids as well as mostly sterile *T. domingensis* x *T. latifolia* hybrids, which are very similar to the mostly sterile *T.* x *glauca*. This is the first record of *T. domingensis* in Wisconsin. It is about 150 miles north of the hitherto known northernmost collection in the Midwest, about 50 miles SSW of Chicago. Because it is native to North America, *T. domingensis* is probably not a serious threat as an invasive weed in Wisconsin.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Somers, Dennis, County Materials Corporation
Jim Langkamp, County Materials Corporation

Permeable paver systems: Sustainable storm water management with permeable paving units

Storm water runoff detrimentally impacts the ecosystem and growing municipalities, especially developments located near sensitive water bodies. Two storm water case studies utilizing permeable paver systems will be examined: Egg Harbor Beach Park and a lake home residence. The presentation explores how storm water management challenges municipalities trying to meet demands for increased parking, roads and driveways. It also explains how permeable pavers increase permeable surface areas to enhance natural storm water infiltration into the soil and minimize flooding, pollution, erosion and escalating costs. Traditionally, retention and detention ponds have been utilized to capture storm water, but they deplete natural open-spaces, take up viable building space, and can present health and safety hazards. Municipalities are passing on costs for managing storm water through additional utility fees added to water and sewer fees. In addition, local zoning regulations are impacting the amount of hard surface area on new and existing lots. Permeable paver systems offer an alternative, low impact storm water management option that rescues rainwater, replenishes the groundwater supply, and filters pollutants like oils and metals from storm water. The system also creates a high strength, durable surface that handles pedestrian and light vehicle traffic. The program will highlight permeable pavers use in a variety of applications including cold climates. Proper construction components, correct design and installation techniques will be identified for effective permeable paver systems. Finally, the presentation will review the proper care and maintenance requirements to ensure lasting performance for permeable paver systems.

Stormwater Management and Wetlands, Thursday, February 23, Maple Lawn A, 10:10 - 10:30 am

Springborn, Heidi, WDNR

A multi-partnered, landscape level approach to *Phragmites* control along Lake Michigan shores

In 2010 WDNR received $805,626 from the Environmental Protection Agency through the Great Lakes Restoration Initiative (GLRI) to control *Phragmites australis* and Lyme grass (*Leymus arenarius*) on 3,600 acres of coastal wetlands and 118 miles of Lake Michigan shoreline in six northeast Wisconsin counties that are identified as Conservation Opportunity Areas in the Wisconsin Wildlife Action Plan. Declines in Lake Michigan water levels over the past 20 years have exposed thousands of acres of new lakebed which has fairly rapidly been colonized by invasive *Phragmites* and Lyme grass. The presence of these two species has resulted in habitat degradation and the outright loss of some coastal wetlands and Great Lakes dunes and beaches. To combat this problem, WDNR partnered with nine conservation partners and over 1,200 private landowners to address this significant challenge. In 2011, a coordinator was hired and treatment began for year one of a three year grant. The partnership entailed securing permissions to spray riparian land adjacent to private lands, having 40 volunteer's map *Phragmites* on 50 miles of shoreline, and hiring contractors to aerial and ground spray 3,400 acres. Areas where *Phragmites* and Lyme Grass will be sprayed include 25 State Natural Areas, six Parks/ Forests, and three Wildlife Areas, and riparian land adjacent to private lands below the ordinary high water mark (OHWM).

Wetland Invasive Plants, Wednesday, February 22, Maple Lawn C, 4:10 - 4:30 pm

Stock, Melanie, UW-Madison Dept .of Soil Science
Nick Balster, UW-Madison

The effects of soil temperature on belowground amphibian hibernation in an urban versus rural environment

Amphibian populations have been on the decline since the 1970s, but few studies have examined the role of overwintering stress on amphibians, especially those in urban landscapes where temperatures are typically elevated relative to rural landscapes (i.e. urban heat islands, UHI). Amphibians using belowground hibernacula rely on a specific range of soil temperatures to maintain metabolic demands throughout winter and emerge in springtime, thus the presence of an UHI may control population numbers. To quantify the UHI in Madison, WI, we are measuring soil temperature, air temperature, frost depth, and snow accumulation at eight sites along a 50 km transect in Dane County, WI, that extends across a rural-urban gradient. To investigate the role of soil temperature on successful belowground amphibian hibernation, we are housing a total of 25 American Toad (*Bufo americanus*) specimens at three sites along the rural-urban transect. We will use Ground Penetrating Radar to detect hibernacula depth and will calculate the change in body mass over winter as a surrogate for metabolic rates. We expect greater soil temperature fluctuations in urban environments due to less snow accumulation, which may elevate the metabolic demands of urban amphibians, causing both a decline in their post-hibernation body condition and an increase in winter mortality rates. As urbanization continues to modify the natural habitat of amphibians, a better understanding of the hibernation patterns within these unique landscapes may help explain declines and improve the conservation of these fossorial species.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Strohl, Derek, Bureau of Land Management

The Bureau of Land Management's islands in Wisconsin's big rivers

The Bureau of Land Management, part of the U.S. Department of the Interior, manages about 500 unsurveyed islands scattered throughout Wisconsin. Most of these islands are in the Chippewa, Wisconsin, Menominee, and Black Rivers, and the rest are scattered among several other rivers and a few small lakes. These islands range in size from under an acre to 180 acres. Most are small: half are less than an acre and just under half are between one and ten acres. The most abundant plant community type on the islands is floodplain forest. Most of the small, low-lying islands have relatively poor plant species diversity, while higher or larger islands tend to have higher plant and plant community diversity. Many of the islands on the Chippewa River contain ephemeral ponds that may serve as breeding sites for amphibians, and the BLM intends to study these habitats in greater detail. Several bird and reptile species of greatest conservation need and state-listed species have been identified on these islands, including red-shouldered hawk, bald eagle, great egret, great blue heron, black-crowned night heron, wood turtle, and several bat species. Many of the islands in urban areas are heavily infested with non-native, invasive plant species. Several of these urban islands located are among the last remaining outposts for wildlife habitat and open space preservation in otherwise urban/industrial settings. The BLM islands in Wisconsin present unique opportunities for research, conservation, and education.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Thompson, Alice, Thompson & Associates Wetland Services
Jesse Jensen UW- Milwaukee
Timothy Ehlinger UW-Milwaukee

Design features and adaptive management for restoring structure and function in an urban floodplain (Pike River II)

The Pike River Restoration is a phased multi-year restoration of a degraded river in Southeast Wisconsin. The project aims to establish a newly constructed river channel and floodplain with a wetland and prairie corridor by establishing native vegetation, and reconnecting wildlife and fisheries to the river and urban green space. Using an adaptive phased approach, the detailed designs utilized in the Pike river restoration have evolved as each reach was restored and monitored. Techniques using coir logs, constructed fabric wrapped banks, fish structures, and native plantings have been integrated with the construction of an expanded floodplain bench and new channel meanders. The successes and challenges of this restoration include managing water quality and restoring river biota, creating fish habitat in new channels, while establishing native vegetation and green space in an urban setting. Adaptive management includes evaluating the impact of restoration actions on the goods and services provided by the river corridor, while managing the river floodplain for ongoing disturbances. Prairie cord grass (*Spartina pectinata*) and sandbar willow (*Salix exigua*) have served as successful ecological tools that both provide cover for biota in the river while serving to block succession of non-native terrestrial plant species. However, the invasive species being monitored and managed include *Phalaris arundinacea* (reed canary grass), *Glyceria maxima* (reed manna grass), *Dipsacus laciniatus* (cut-leaved teasel), and *Phragmites australis* (giant reed grass). Our ability to control these species, including the recent expansion of *Glyceria maxima* into restored areas of the river, challenges the long-term stability of native vegetation.

Management Planning for Wetlands, Wednesday, February 22, Maple Lawn B, 11:40 am - 12:00 noon

Thompson, Mike, Wetlands Forever, Inc. and Forrest Keeling Nursery

The Walk-Away-System: A multi-benefit planting regime for wetland sites

Wetland conservation planting sites have difficult obstacles to overcome to be successful. Dynamic site conditions, such as hydrology, soil, landscape, plant quality, and planting practices affect success. The Walk-Away-System provides conservation professionals with a system to address difficult wetland sites. The Walk-A-Way system supports wetland projects that get little or no attention after planting. The planting system extends plant growth beyond easy reach of browsing deer, floodwaters, and sunlight competition. The Walk-A-Way System includes ground preparation, cover crop establishment, tree establishment, and plant protection/maintenance. A case study of planting sites will provide an overview of system components that promote survivability. Ground preparation steps address concerns relating to hydrology and wildlife pressure at the site. The cover crop component addresses plant competition, invasive species and successional stages. Tree establishment focuses on superior plant stock, native species, plant competition, hydrology and wildlife pressure. Plant protection supports reduced mechanical damage by wildlife and soil moisture retention. High quality RPM plant stock with its vigorous root system provides superior plant survivability; improved transplantability; accelerated growth rate; increased success rates; and overall project cost savings. The Walk Away System makes good economic sense! The case studies will examine successful wetland site restoration in 10 years, half the time of typical successional models for wetland restoration. Instead of taking 20 years to produce acorns, RPM species fruit earlier, which means natural regeneration and an abundant food source for wildlife.

Wetland Restoration Techniques, Wednesday, February 22, Maple Lawn C, 11:40 am - 12:00 noon

Trewartha, Rebecca, Friends of the Platte River

Japanese Hops in the Platte River Watershed

During the summer of 2011, Friends of the Platte River began research on techniques for controlling Japanese hops (*Humulus japonicus*). The Japanese hop is an invasive plant that has started to invade southern Wisconsin and poses a significant threat to the rivers and wetlands of this region. We established test plots on a floodplain where the plant has grown to a dense monoculture. We used both chemical and mechanical methods so we could present some options for landowners who would like to try to get rid of the plant. We learned that some chemical and some mechanical methods work better than others. Information from this research project will be used to educate landowners about methods to treat infestations within the watershed to possibly eradicate the plant from the area.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Van Dyke, Fred, Wheaton College
Allison Engel, Taylor University
Julia Ryan, Wheaton College
Erin Pyne, Wheaton College
Gwen Dreyer, Wheaton College
Rachel Lamb, Wheaton College

Urban environments, amphibian biodiversity, and vernal pools: Does clustering affect community diversity?

In urban environments, wetlands are fragmented by areas of non-habitat created by human development, limiting movement and gene flow of species with limited dispersive abilities, such as amphibians. For forest dwelling amphibians, vernal pools are important habitats because they provide fishless breeding areas, reducing risk of predation to eggs and larvae. Because habitat loss and isolation of wetlands in urban environments decrease population size and increase extinction risk, clustered arrangements of vernal pools might provide increased community diversity and population persistence compared to isolated pools and mitigate adverse effects of reduced opportunities for longer-range dispersal, but effects of clustering have not been well investigated. To determine effects of clustering concurrent with assessment of contributions of vernal pools to local amphibian diversity, we compared amphibian community diversity and species persistence in clustered vernal pools to isolated pools and freshwater marshes in forest preserves in DuPage County, IL. Amphibian communities were dissimilar in these three wetland categories in most years. Species richness was similar in clustered vernal pools and marshes. but lower in isolated pools. Highest average site-specific amphibian community diversities were associated with marshes, but, in aggregate, clustered vernal pools contributed more species (10) than marshes (7) or isolated pools (4), including three, Cope's gray tree frog (*Hyla chrysoscelis*), eastern newt (*Notophthalmus viridescens*) and spring peeper (*Pseudacris crucifera*), not found in other wetland categories in this landscape. If amphibian biodiversity is a management goal, clusters of vernal pools should be given conservation priority in these and similar forest preserves.

Habitat Needs for Wetland Wildlife 2, Thursday, February 23, Maple Lawn B, 11:40 am - 12:00 noon

von Ende, Carl, Northern Illinois University
Jason P. Martina, Michigan State University

Highly plastic response in morphological and physiological traits to light, soil-N and moisture in the model invasive plant, *Phalaris arundinacea*

An introduced species' ability to thrive is likely influenced by its capacity to cope with disturbance and resource fluctuation, i.e. by being phenotypically plastic. The biomass and resource allocation of the invasive plant species, *Phalaris arundinacea* (reed canarygrass), to contrasting levels of light, soil-N and moisture were evaluated in a factorial design in a greenhouse growth experiment with seedlings. We predicted that *P. arundinacea* would show a highly plastic response in important growth and physiological traits to treatment conditions (presence of three-way interactions and large phenotypic plasticity index (PI) values) because of its ability to persist in variable environments. There were significant three-way interactions for seven of nine plant traits, including belowground biomas, aboveground biomass per tiller, shoot/root ratio, shoot C/N ratio, root C/N ratio, and leaf chlorophyll content. Total plasticity values across all treatment combinations were larger than any of the PI values for the individual treatments (main effects). Understanding the magnitude of plasticity expressed in common invasive species is an important area of research because aspects of their aggressive behavior may be explained by how they grow and allocate resources under variable environmental conditions, which in turn can be important when seeking to make predictions about the probability and degree of invasion success with species-specific invasion models.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Werner, Patty, Lake Co. Stormwater Mgmt. Commis.
Michael Prusila, LCSMC
Michael Novotney, LCSMC
Jodi McCarthy, former LCSMC
Jeff Boeckler, Northwater Consulting
James Adamson, Northwater Consulting

Developing a restoration and management plan for a watershed with one creek in two states

The North Mill Creek-Dutch Gap Canal Watershed-Based Plan was recently completed as the first bi-state watershed planning effort by Lake County Illinois. The purpose of the plan is to restore watershed lakes, streams and wetlands to a healthy condition; reduce the impacts of water pollution and flood damage on residents; and provide opportunities for watershed residents to have a significant role in the process. A creek known as Dutch Gap Canal in Wisconsin and North Mill Creek in Illinois drains the 37 square mile watershed in north central Lake County, Illinois and south central Kenosha County, Wisconsin to the Des Plaines River. The watershed has abundant water resources including 39 miles of stream, more than 4,164 acres of wetlands, and 24 named lakes encompassing approximately 1,066 acres. The watershed plan was created to help stakeholders better understand the watershed and to identify what actions need to be taken to prevent and reduce flood damage, improve water quality, and protect and enhance natural resources, greenways, and recreational opportunities. This comprehensive management plan summarizes the overall condition of the watershed (present day and into the future) and recommends actions to protect watershed resources that are still in good shape and restore those that are degraded. Wetland protection and restoration priorities and opportunities are included in the watershed action plan. This watershed-based planning effort was funded in part by the Illinois Environmental Protection Agency using funds provided by US EPA through Section 319 of the Clean Water Act.

Biologists Without Borders in Action, Thursday, February 23, Maple Lawn C, 11:20 - 11:40 am

Wernerehl, Robert (Bob), Native Thumb Environmental Consulting
Tom Bernthal, WDNR

EPA's National Wetland Condition Assessment in Wisconsin

The USEPA's National Wetland Condition Assessment took place in 2011. In the lower 48 states, over 1200 sites were selected randomly in a multi-stage, stratified random process based on USFWS Wetland Status and Trends report. Sites fell on both private and public land. Exploratory field work and landowner contact resulted in sites being kept or dropped in a systematic, structured manner that preserved the random nature of the final selection of sites. As lead botanist, I led WDNR's crew surveying 27 wetlands all across the state, from Dane to Door to Douglas Counties. Surveys included buffer plots, soil pits, and algae collections. Water samples were taken if standing water was over 15 cm in depth. We found pristine, highly diverse wetlands, and some that were degraded. I'll provide a background to the survey, discuss field methods and some preliminary results, accompanied by maps and plentiful photos. I'll discuss potential correlations between low diversity sites and types of disturbance, as well as potential drivers for high diversity sites.

Strategies for Prioritizing Restoration, Wednesday, February 22, Maple Lawn C, 2:20 - 2:40 pm

Wolf, Joy, UW-Parkside
Justin Chappelle, Northeastern Illinois University

Ephemeral pond diversity across varying basin attributes and land ownership

Ephemeral ponds are isolated wetlands that provide important breeding and wildlife habitats for specific amphibians and invertebrates. These ponds are identified by indicator species found almost exclusively in basins that hold water for part of the year and usually dry up during summer. To determine if basin characteristics predict diversity, we used data monitored for 64 ponds in southeastern counties in Wisconsin. Methods included verifying a ground feature from an aerial map as an ephemeral pond and collecting physical and biological data for the Wisconsin Ephemeral Pond Project, a citizen monitored project funded by the Wisconsin Coastal Management Program, UW-Extension, and WDNR. Data were analyzed with ANOVA, t-tests, regression, and perimeter complexity comparisons. Our preliminary results show that species richness was higher in public land ponds, specifically fingernail clams and red mites. Round basins had the lower richness compared to irregularly shaped basins. For soil texture, water clarity, and vegetation, we found more species in ponds with mucky soil, brownish water, and higher tree cover. Fingernail clams, fairy shrimp, caddisfly, and pouch snails were more abundant in mucky basins. These initial data contribute to establishing a state-wide database for Wisconsin Ephemeral Pond Project to better understand fragile ephemeral pond patterns, land management decisions and future funding opportunities. More data continue to be collected and analyzed.

History as a Factor in Wetland Restoration, Wednesday, February 22, Maple Lawn A, 1:00 - 1:20 pm

Woods, Brock, WDNR & UWEX
Mindy Wilkinson, WDNR and UWEX
Pat Trochlell, WDNR

Statewide Wisconsin wetland invasive species strategy formulated

Wisconsin has long needed a broad strategy for reducing the effects of invasive species in wetlands. This strategy has been developed as part of the Wisconsin Wetland Team's goal of "Reversing the Loss" of wetlands in the state. It should help do this by identifying needed invasive species control steps, as well as identifying and helping mobilize the resources needed to be successful. It should also help recruit more workers to help in control efforts by showing them that a comprehensive, workable strategy is in place, and how they can fit in. Many professional and citizen workers have battled invasive species in some wet places for years--with some great results, but this plan should make it easier to prioritize efforts and help save or restore most wet places threatened by invasive species. The strategy is built around five goals: preventing importation and dispersal of invasive species; early detection and rapid elimination of new infestations; effective control where invasive species have already established; increasing effective outreach to involve more citizens; and expanding invasive species research. Supporting objectives and specific needs are included, along with several short term projects within WDNR that are designed to utilize existing funding to move forward along as many fronts as quickly as possible. Comments and suggestions about this evolving document are encouraged. Copies will be handed out at the session, or you can download the document from the WDNR's wetland website at http://dnr.wi.gov/wetlands/invasives.html. Address comments to any of the listed authors.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Zacharias, Joseph, Carroll University
Eric Thobaben, Carroll University

Economic and ecological trade-offs over six years of a long-term buckthorn removal experiment

Common buckthorn (*Rhamnus cathartica*) and glossy buckthorn (*Rhamnus frangula*) are invasive species that reduce the floristic quality of wetland communities in the Midwestern United States. Six years ago, buckthorn removal began along the Genesee Creek at the Carroll University Greene Field Station. In spring 2006, three methods were used to remove adult buckthorn trees: cut and apply herbicide to stumps, manual removal, or no treatment. Saplings were then treated two years later using the same methods. Once adult buckthorn had been removed, beginning in spring 2008, seedlings were treated via 16 different spring/fall combinations of the following four treatments: foliar herbicide, precision torching, manual removal, or no treatment. The cost of supplies and time spent treating seedlings were recorded to establish the most cost-effective treatment for removing buckthorn seedlings. Plant surveys were used to describe plant community composition and to calculate Floristic Quality Index (FQI) values in order to estimate the ecological value of the plant communities in the experimental plots relative to goal communities in sedge meadow and wet woods reference plots. Over four years of seedling treatment, the extrapolated total cost per acre of the 16 treatments ranged from $4,785-$17,221 (mean = $11,663). Treatments including foliar herbicide, particularly during the spring, were least expensive. The FQI values for the plant communities in treated plots ranged from 12.7-15.8 (mean = 14.3) with the lowest FQI values in plots treated with foliar herbicide. Foliar herbicide application appears to be less expensive, but generates plant communities of lower ecological value.

Wetland Invasive Plants, Wednesday, February 22, Maple Lawn C, 4:30 - 4:50 pm

Zedler, Joy, UW-Madison Department of Botany
James Doherty, UW-Madison
Isabel Rojas-Viada, UW-Madison
Madeline Fisher, UW-Madison
Paul Zedler, UW-Madison

Learning to manage urban runoff that reaches the UW-Madison Arboretum

Curtis Prairie's 144-acre urban watershed discharges far more runoff of much lower quality than it did 77 years ago, when most of the 72-acre grassland was a horse pasture. Debates concern (a) whether inflows benefit the prairie by supporting native wetland plants or impair it by facilitating invasions and (b) how to manage a 1-acre retention pond that has accumulated sediment over 30 years. Designed to remove suspended solids and phosphorus (P), Curtis Pond now supports shallow water and peripheral marsh that removes nitrogen (N), based on concentrations in through-flowing water (2010-11 data). The pond might remove enough N to reduce the spread of invasive *Phalaris arundinacea*, which is confined to <1 acre of Curtis Prairie's ~15-acre wetland. Two natives (*Calamagrostis canadensis* and *Carex stricta*) dominate the wetland and are resisting invasion, perhaps because they are highly productive (~960 and 860 g/m2 of shoots, respectively; 2011 data). The wetland likely cleanses urban runoff, with plants taking up nutrients and adding organic matter to the wet soil, thereby facilitating denitrification. We therefore question proposals to dredge or enlarge Curtis Pond and recommend considering N dynamics, not just P removal. Dredging could damage, rather than benefit, the downstream wetlands. The ultimate solution, of course, is for educated citizens to manage their upstream properties to release less N and P and infiltrate more rainfall (e.g., using permeable surfaces). Toward that aim, citizen volunteers are helping us prepare two educational leaflets, which we will unveil for feedback at this conference.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

Zellmer, Jonathan, McMillan Marsh State Wildlife Area Volunteer

Blanding's Turtle conservation and educational efforts in a portion of Wisconsin affected by suburbanization

A central Wisconsin Blanding's turtle (*Emydoidea blandingii*) population with centralized habitat located within McMillan Marsh State Wildlife Area has been monitored over the past 20 years through volunteer effort and personal funding. This population of Blanding's turtles has been affected by suburban residential development. The negative impacts of suburban development include: loss of rural habitat, road mortality of turtles, increased human disturbance of nesting turtles, and soil compaction of nesting habitat. Suburban development has created a partially positive impact by providing nesting habitat through introduction of road shoulders in an area that has poor soil type for turtle nesting success. During the past 20 years the information gathered included: nesting female Blanding's turtle activity, road mortality of turtles, nest mortality, nest site locations, and recreational use of public land during nesting seasons. In recent years turtle nests were protected through use of protection devices, and information regarding success of egg development was collected. This information will be used in helping to ensure the presence of Blanding's turtles in this troubled location for future generations. Recent declines in presence of adult female Blanding's turtles during nesting season has been noticed especially near areas with the most road mortality. The dynamics of Blanding's turtle populations should require conservation efforts—prior to noticeable declines in adult turtles—to help ensure continued presence of this turtle species. Blanding's turtle ecological needs are a living educational tool for protecting healthy connections between wetlands and surrounding habitats.

Poster Session, Wednesday, February 22, Ballroom Foyer, 5:00 - 6:30 pm

PRESENTER BIOGRAPHIES

Jim Anderson (janderson@LCFPD.org) is the Natural Resource Manager for Lake County (IL) Forest Preserves where he has developed restoration priorities and methods to manage 28,000 acres. He also serves as the chair of the Coordinating Group of Chicago Wilderness. Recently efforts have focused on developing priorities for the protection and restoration of natural resources and coordinating implementation of these priorities.

Nancy Aten (NancyAten@LandscapesofPlace.com) is Principal at Landscapes of Place LLC, leading ecological landscape design, restoration, and stewardship initiatives. Her projects range from wetlands in a state natural area to historic cultural landscapes to urban brownfields. Aten was the recipient of a 2011-2013 State Wildlife Grant for restoration and a 2011 national award from the American Society of Landscape Architects for an urban restoration plan.

David Bart (dbart@wisc.edu) received a Masters in Anthropology and a Ph.D. in Ecology and Evolution from Rutgers, the State University of New Jersey. He is currently an Assistant Professor in Landscape Architecture at UW-Madison. His research foci include plant invasion prevention and control, land-use legacy effects on wetland communities, and human-environmental interactions.

Mary Kay Baum (marykbaum@gmail.com) is a Nature photographer who was a Dane County board supervisor and Madison school board member. She directed Madison-area Urban Ministry until early Alzheimer's symptoms. She co-edited, "Pathways of Hope: Living Well with Cognitive Changes." Baum has a UW-Madison law degree. She volunteers for her family's White Cedar swamp, her housing co-op's wetlands, and the Driftless Area Land Conservancy.

Colin Belby (cbelby@uwlax.edu) is an assistant professor in the Department of Geography and Earth Science at UW-La Crosse. He holds a PhD in fluvial geomorphology from the UW-Madison. His active research focuses on sedimentation and nutrient sequestration on the Mississippi River floodplain and legacy lead contamination in wetlands.

Tom Bernthal (thomas.bernthal@wisconsin.gov) is the Wetland Assessment and Monitoring Coordinator for WDNR. He has a Masters in Water Resources Management from UW-Madison. He works on 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.

Tyler Brandt (tyler.brandt@wisconsin.gov) received his B.S. in Biology from the UW-Platteville in 2010. He is currently a conservation biologist at the WDNR in the Bureau of Endangered Resources.

Lesley Brotkowski (lbrotkowski@bheenvironmental.com) is Principal Ecologist at BHE Environmental, Inc. She specializes in wetland and upland habitat assessments, botanical and wildlife surveys, restoration planning, and endangered species surveys. Lesley has been conducting research on the Federally Endangered Hine's emerald dragonfly, *Somatochlora hineana* for over ten years, working closely with the USFWS, WDNR, and the University of South Dakota.

Josh Brown (josh.brown@cardno.com) is an ecologist at Cardno JFNew. There, he carries out wetland delineations, botanical inventories, endangered species surveys, and a variety of other resource management-related projects. Josh received his Masters in Water Resources Management in 2008 from UW-Madison.

Eric Carson (eccarson@wisc.edu) received his Masters in Geology and his Doctorate in Geology and Geography from the UW-Madison. He has worked at the Wisconsin Geological and Natural History Survey since 2008. His research focuses on landscape evolution, fluvial processes, and constraining the late Pleistocene glacial chronology in the Upper Midwest.

Gary Casper (gcasper@charter.net) has been a Wisconsin herpetologist and ecologist for over 35 years through the Milwaukee Public Museum and the UW-Milwaukee Field Station. His research focuses on the western Great Lakes region, where he was recently pinched by mudbugs in his salamander traps.

Justin Chappelle (minbro@aol.com) is a current Masters student at Northeastern Illinois University. His training has been in geography and environmental studies relating to biogeography and remote sensing. Justin's research involves using remote sensing and GIS applications to detect ephemeral ponds in various landscapes throughout the United States. Future research projects will involve using GIS applications in mapping land cover changes.

PRESENTER BIOGRAPHIES

James Doherty (jdohert1@gmail.com) received a B.S. in biology from Binghamton University (SUNY) in 2008, a Masters in Botany from UW-Madison (2010), and is now a doctoral candidate at UW-Madison working with Dr. Joy Zedler to examine the trade-offs in ecosystem functions and services that can be provided by diverse vs. strongly-dominated wetlands.

Timothy Ehlinger (ehlinger@uwm.edu) is an associate professor of Biological Sciences at UW-Milwaukee where he teaches aquatic ecology, fisheries, and conservation. His research through the UW-Milwaukee is focused on understanding the habitat requirements, ecology, reproduction and conservation of freshwater fishes. With 30 years experience, his projects include reestablishment of native fishes, stream restoration, and watershed planning.

Sara Erickson (erickson.sara@uwlax.edu) *did not submit a biography.*

Pamela Geddes (p-geddes@neiu.edu) is an assistant professor in the department of Biology at Northeastern Illinois University. She has a PhD from University of Chicago, a Masters from Florida International University, and did post-doctoral research at Loyola University Chicago.

Brian Glenzinski (brian.glenzinski@wisconsin.gov) graduated from UWSP in 1995 with a B.S. in Wildlife and Biology. He started with the WDNR in 1996 and has worked for the Bureau of Endangered Resources, Wildlife Management, and Integrated Science Services during his time with the agency.

Wesley Glisson (wjglisson@gmail.com) is a Masters student studying plant biology and conservation at Northwestern University and a research assistant with the Chicago Botanic Garden. He received his Bachelors in Biological Sciences from Northern Illinois University. He has worked on numerous conservation and restoration efforts involving plants, animals, and their relationships in academia, the federal government, and the private sector.

Kimberly Greene (kimberlyannegreene@gmail.com) is a second year graduate student at Loyola University Chicago. She graduated from the University of Michigan in 2009 with a Bachelors in Ecology and Evolutionary Biology with a minor in Environmental Studies. Kim also worked in a Great Lakes Ecology laboratory at the University of Michigan where she studied zooplankton of the Great Lakes.

Rusty Griffin (rusty_griffin@fws.gov) is a wetland specialist for the USFWS's National Wetlands Inventory. He has over 5 years experience mapping and classifying wetlands.

Brice Grunert (bgrunert@uwm.edu) is an MS student at UW-Milwaukee's School of Freshwater Sciences, where he received the Dutton Fellowship. His research is focusing on phytoplankton dynamics and nutrient gradients in Green Bay. He received a Bachelors in Biology and English from University of Missouri, where he researched the acoustic preferences and subsequent behavior of the gray treefrog, *Hyla versicolor*.

Carmen Hardin (carmen.hardin@wisconsin.gov) is a Forest Hydrologist at WDNR. She has Bachelors in both Soil Science and Biological Conservation and a Masters in Environmental Planning from UW-Madison. At the WDNR, Carmen spent 6 years working on shoreland development issues, and for the last 7 years, she has been working on forest management and water quality issues.

Jesse Jensen (jmjensen@uwm.edu) is an Ecologist at the UW-Milwaukee where he earned his Masters. Jensen has conducted research in biological monitoring, ecotoxicology, watershed analysis and coastal zone ecosystems. He has 4 years experience of conducting fish, invertebrate, water quality, and habitat surveys on the Pike River Restoration Project.

Jens Jensen (jens.jensen@cardno.com) manages complex, multi-year ecological restoration and performs ecological consulting and design. With nearly 10 years of experience in natural resource management, he supervises and implements techniques in restoration ecology, including invasive species control, bioengineering, prescribed burning, and native seed and plant installation. Jens also assists with managing day-to-day field crew operations.

Sarah Johnson (sjohnson@northland.edu) is Assistant Professor of Natural Resources at Northland College in Ashland, Wisconsin. She received her Ph.D. in Botany from UW-Madison in 2011.

PRESENTER BIOGRAPHIES

Judith Joyce-Krieg (judy@earthviewenvironmental.com) is president of EarthView Environmental, LLC which provides natural resource planning and geomorphologic services for proposed land use changes. She has worked closely with municipalities, developers, energy companies, consultants and the public sector to obtain environmental clearances pertaining to wetlands, threatened and endangered species, and other sensitive areas. She is also president of TAKO – Take a Kid Outdoors.

Andrew Knapp (andrew.knapp@gotoltc.edu) is a Horticulture Instructor at Lakeshore Technical College. He has a Masters from the Nelson Institute for Environmental Studies at UW-Madison. He worked with horticulture technician students from Lakeshore Technical College and Jim Kettler of Lakeshore Natural Resources Partnership on this project.

Randy Korb (rkorbbio@aol.com) is Project Director for the Wisconsin Salamander Survey.

Evan Link (evan.link@lawrence.edu) is a Biology major in his Junior year at Lawrence University working with Brock Woods.

Mary Linton (snappinglinton@gmail.com) is a certified ecologist (ESA) and wetland biologist and Board Chair for Wisconsin Wetlands Association. She worked with Alice Thompson (certified wetland scientist (SWS) and owner of Thompson and Associates Wetland Services), Samantha Foster (an educator and turtle biologist), and Penni Klein (Director of the Public Lands Department for the City of Middleton, WI) on this project.

Amanda Little (littlea@uwstout.edu) received her doctorate from UW-Madison in 2005 with dissertation research on beaver and human impacts to wetlands in Acadia National Park, Maine. Current research focuses on vernal pools, invasive plant species, and GIS applications to natural resource problems.

Kyle Magyera (kyle.magyera@wisconsinwetlands.org) is a Policy Specialist with Wisconsin Wetlands Association (WWA), where he coordinates the local outreach program and supports individuals and organizations working to protect and restore local wetlands. He holds Masters in both Urban and Regional Planning and Water Resources Management from UW-Madison.

Alex Martin (albert.martin@wisconsin.gov) has been working with WDNR for over 10 years in fisheries research and is currently the Wetland Activity Tracker. He compiles, reports on, and disseminates statewide wetland data and maps. He has a Masters from UW-Stevens Point in Environmental Education and a GIS certificate from UW- Madison.

Jeff Martinka (martinka@swwtwater.org) is the Executive Director of Sweet Water, the Southeastern Wisconsin Watersheds Trust, Inc., which plans and funds water quality collaborations in the five Milwaukee area watersheds. Martinka earned Masters in Urban and Regional Planning and Public Administration at UW-Madison.

Jeffrey Matthews (jmatthew@illinois.edu) is a wetland plant ecologist at the Illinois Natural History Survey at the University of Illinois. Dr. Matthews received a PhD from the University of Illinois in 2008. His research involves the application of ecological succession, community assembly and landscape ecology to wetland restoration.

Debbie Maurer (dmaurer@LCFPD.org) works as an Ecologist and Assistant Manager of Natural Resources for the Lake County Forest Preserve District (IL). Debbie assists partners in the Chiwaukee Illinois Beach Lake Plain to plan and implement collaborative restoration actions to achieve ecological improvements at a landscape scale. Debbie has a Masters in Botany from UW-Madison and a Bachelors in Conservation Biology from UW-Milwaukee.

Madeleine McLeester (maddie@uchicago.edu) is a PhD candidate in the Department of Anthropology at the University of Chicago. Using methods such as pollen and stable isotope analyses, McLeester investigates the environmental impact of indigenous land use strategies in the Calumet Region.

Martin Melchior (mmelchior@interfluve.com) is a Regional Director for Inter-Fluve, a river and stream restoration design firm. He is based in Madison, WI.

Jeffrey Mengler (jeffrey.mengler@cardno.com) is a Senior Project Scientist with Cardno ENTRIX prior to which he was a senior biologist for 18 years for USFWS. He serves as co-chair of the Chicago Wilderness Green Infrastructure Vision Task Force and co-chair of the Chicago Wilderness Natural Resources Management Team. He holds Bachelors and Masters in Biological Sciences from Northern Illinois University.

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Jeffrey Miller (jfmiller4@wisc.edu) is a Ph.D. student at UW-Madison, where he studies the environmental and economic tradeoffs between centralized and distributed stormwater management techniques. In 2010, Jeff received a Bachelors in Civil Engineering and Engineering and Public Policy from Carnegie Mellon University in Pittsburgh, PA.

Nick Miller (nmiller@tnc.org) is director of science for The Nature Conservancy in Wisconsin. His work includes conservation planning, monitoring and modeling conservation outcomes, and translating science into conservation tools. Through collaborations with partners, Nick has been creating approaches to restore watersheds and wetlands for their biodiversity and benefits to people, and exploring the impact of conservation across large forested systems.

James Montgomery (jmontgom@depaul.edu) is an Associate Professor in the Department of Environmental Science and Studies at DePaul University in Chicago. He holds Bachelors and Masters in Geology from Baylor University and a Ph.D. in soil science from Washington State University. His research interests include wetland biogeochemistry, urban soils and sustainability.

Eric Parker (eric.parker@stantec.com) is a Senior Scientist/Botanist with Stantec Consulting Services, Inc. Eric is a graduate of UWSP's College of Natural Resources and has worked as a wetland scientist in Wisconsin for 25 years. In the 1990s, Eric advocated for the use of Floristic Quality Assessment in Wisconsin, now an important tool for identifying remnants and assessing wetland function.

Heather Patti (heather.patti@rasmithnational.com) is a wetland scientist & ecologist at R.A. Smith National in Brookfield, Wisconsin. She has a Masters in Botany from North Carolina State University and a Bachelors in Biology from University of North Carolina at Wilmington, and she is a certified Professional Wetland Scientist (SWS). She worked with Alice Thompson on this project.

Ken Powell (ken.powell@state.mn.us) received a Bachelors in Wildlife from the UWSP and a Masters in Biology from Kansas State University. He is a Senior Wetland Specialist with the Minnesota Board of Water & Soil Resources responsible for various technical and policy aspects of the state wetland regulatory program.

Stephanie Prellwitz (sprellwitz@wisc.edu) is a Research Assistant and graduate student in the Department of Biological Systems Engineering at the UW-Madison under the direction of Anita Thompson. She received her B.S. in Biosystems and Agricultural Engineering from the University of Kentucky. She is currently researching the ability of diverse constructed wetlands to improve urban stormwater quality and reduce erosion rates.

Gregory Quartucci (greg.quartucci@cardno.com) has more than 20 years of experience in environmental permitting and restoration. Mr. Quartucci participated in urban restoration projects including prairie, dune and swale, and forest habitats. He has worked on several "green" transportation initiatives in Illinois and Indiana. Since 2007 he has advised the ITRC on their toll road expansion and mitigation project.

John Rogner (john.rogner@illinois.gov) is currently the Assistant Director of the Illinois DNR. He has spent his entire career in government, first with the U.S. Army Corps of Engineers working in the wetland regulatory program and later with the USFWS working on habitat conservation and endangered species issues. He holds degrees in Biological Sciences from Northern Illinois University.

Shawn Rossler (shawn.rossler@wi.gov) received a Bachelors in Natural Resources Management and Masters in Conservation Biology from Central Michigan University. His thesis looked at control methods for reducing wolf caused depredation of livestock. Following graduation he worked for 2 years with the US Forest Service as a research technician studying fisher. Since 2009, he has worked for the Wisconsin DNR as the Assistant Furbearer Specialist.

Joseph Roth (jroth@openlands.org) is the Director of Restoration Programs for Openlands, a conservation not-for-profit organization that has been working in northeastern Illinois since 1963. Roth is responsible for overall management of Openlands' wetland restoration programs, including the O'Hare Modernization Mitigation Account (OMMA), which is funding a portion of the over-all remeandering of Spring Creek and wetland restoration at Hadley Valley Preserve.

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Dan Salas (dan.salas@cardno.com) has worked in the field of ecological restoration and natural resource management for nearly 15 years. His background includes invasive species control, endandered resource surveys, GIS analysis, stream and wetland restoration, and conservation planning. He is an Ecologist certified through the Ecological Society of America.

Reed Scherer (reed@niu.edu) is Presidential Research Professor in the Department of Geology and Environmental Geosciences and Director of the Institute for the Study of the Environment, Sustainability and Energy and new Environmental Studies degree program at Northern Illinois University. He received his PhD from the Ohio State University and is an expert on Antarctic ice sheet history and processes using diatoms as tracers.

Carl Schwartz (cschwartz3@wi.rr.com) is coordinator of Bird City Wisconsin and vice president of the Wisconsin Society for Ornithology, coordinating the Honey Creek Birdathon/Bandathon. He is field trip chairman for the Riveredge Bird Club and president of the Friends of the Cedarburg Bog. He retired in 2009 as senior editor for national and international news at the Milwaukee Journal Sentinel.

Penelope Shackelford (shackelfordp@centurylink.net) and her husband Gary are co-owners of Fair Meadows State Natural Area, a 380-acre tract of rural property in Southeast Wisconsin. They have been restoring Fair Meadows since 1985. Penelope is Treasurer of the Wisconsin Wetlands Association.

Thomas Simpson (tsimpson@mccdistrict.org) has been the Field Station Ecologist with McHenry County Conservation District since 2004, where he works in land management, education, mentoring college interns, and research.

Brian Sloss (bsloss@uwsp.edu) is the Assistant Unit Leader of the U.S. Geological Survey's Wisconsin Cooperative Fishery Research Unit at UWSP. Dr. Sloss is a conservation geneticist specializing in natural resource-related issues. His laboratory has worked on various Wisconsin-related issues over the past decade including Butler's Gartersnakes, Brook Trout, Lake Sturgeon, Lake Whitefish, Walleye, Muskellunge, Bobcat, and Elk.

Thomas Slowinski (tslowinski@v3co.com) is Vice-President of Wetlands and Ecology in the Natural Resources Division of V3 Companies, the design-build firm responsible for the remeandering of Spring Creek and associated wetland restoration at Hadley Valley Preserve. Mr. Slowinski provides technical oversight to a large multi-disciplinary staff that provides wetland and ecological consulting services to public and private sector clients.

Christopher Smith (christopherj.smith@wisconsin.gov) has been a member of the WDNR for twelve years specializing in Water Resource GIS needs. He received his Bachelors in History and Geography from UW-Platteville and his Masters in Geoenvironmental Studies from Shippensburg University. He currently works on wetland assessment projects in the Bureau of Water Quality at WDNR.

S. Galen Smith (sgsmith2@wisc.edu) is retired from the Biology Department at UW-Whitewater. He did his graduate work on Typha and has revised the genera of *Typha*, *Scirpus*, and *Eleocharis* for the Flora of North America. Smith served on the Wisconsin Wetlands Association board for more than a decade. He worked with Mary Linton and Alice Thompson on the work described in this poster.

Dennis Somers (dennis.somers@countymaterials.com) is the Landscape Division Manager with County Materials. His diversified background in landscape and masonry practices includes sales, sales management, product training, presentations and business development for the company's diverse landscape product lines. Dennis is active with the Wisconsin Masonry Alliance and the Interlocking Concrete Pavement Institute.

Heidi Springborn (heidi.springborn@wisconsin.gov) is a conservation biologist for the WDNR in Bureau of Endangered Resources. She was hired in December 2010 to coordinate field activities of a Great Lakes Restoration Initiative invasive species control grant received by WDNR with a focus on *Phragmites* and Lyme grass control from coastal wetlands along the northern Lake Michigan shoreline.

Melanie Stock (stock@wisc.edu) is in the second year of her Masters program in the Department of Soil Science at UW-Madison, where she is studying the effect of urban heat islands on belowground amphibian hibernation. Melanie graduated with a Bachelors in Botany, Zoology, and Biological Aspects of Conservation from the UW-Madison in 2008.

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Derek Strohl (dstrohl@blm.gov) is the Natural Resources Specialist for the Bureau of Land Management's Eastern States Field Office in Milwaukee. Most of Derek's work involves oil and gas drilling in the Midwest and stewardship of unsurveyed islands in Wisconsin and northeastern Minnesota.

Alice Thompson (thompsonandassoc@sbcglobal.net) is a wetland ecologist and owner of Thompson and Associates Wetland Services and consults on wetland issues and projects. She has a Masters from UW-Milwaukee, where she researched reed canary grass, an invasive wetland species. Thompson is a certified Professional Wetland Scientist with the Society of Wetland Scientists.

Mike Thompson (mthompson@fknursery.com) is the President of Wetlands Forever, Inc. (WFI), a wetland restoration company that designs, constructs, and manages wetland mitigation banks in Southern Illinois. Thompson serves as a Project Manager with Forrest Keeling Nursery on its Root Production Method technology as it relates to conservation, restoration and environmental services programs.

Rebecca Trewartha (trewtraveler@yahoo.com) is Research and Programs Coordinator for Friends of the Platte River. She graduated from the UW-Platteville in May 2010 with a major in Geography and a minor in Environmental Science. Since then, she has worked for Friends of the Platte River with her primary focus being Japanese hops.

Fred Van Dyke (fred.vandyke@wheaton.edu) Fred Van Dyke is Professor of Biology and Director of the Environmental Studies Program at Wheaton College (Illinois). He was a wildlife biologist for the Montana Department of Fish, Wildlife & Parks and is author of the textbook, *Conservation Biology: Foundations, Concepts, Applications*.

Carl von Ende (cvonende@niu.edu) is Associate Professor at Northern Illinois University. He worked with Jason P. Martina, a Ph.D. candidate in the Department of Plant Biology at Michigan State University, on the research described in this poster.

Patty Werner (pwerner@lakecountyil.gov) is Planning Supervisor for Lake County (IL) Stormwater Management Commission developing watershed, flood mitigation, and green infrastructure plans and managing restoration projects. Patty has Master both in Environmental Science and Public Administration and a Bachelors in Business Economics from Indiana University Bloomington; is a certified Planner and Floodplain Manager; and formerly directed the Hoosier Sierra Club Wetlands Project.

Robert (Bob) Wernerehl (wernerehl@wisc.edu) is a botanist/ecologist and owner of Native Thumb Environmental Consulting and has conducted wetland surveys in Wisconsin since 1973. Bob is also finishing a PhD in plant ecology at the UW-Madison Department of Botany. Bob has conducted many rare plant surveys in the Ottawa and Chippewa National Forests (Michigan and Minnesota).

Joy Wolf (wolf@uwp.edu) is an Associate Professor of Geography at UW-Parkside. Her research interests include biogeography, restoration ecology, and disturbance ecology, specifically fire, using dendrochronology techniques. She also studies exotic invasion with a focus on impacts to native plant communities and soil processes. She conducts research in a variety of plant communities, including ephemeral ponds, in Wisconsin.

Brock Woods (brock.woods@wisconsin.gov) received a Bachelors from Lawrence University in 1973 and a Masters from UW-Madison in 1981 in Botany and Plant Ecology. He developed and runs the state's Purple Loosestrife Biocontrol Program.

Joseph Zacharias (jzachari@pio.carrollu.edu) is a senior Biology major at Carroll University. He will be attending dental school beginning in Fall 2012.

Joy Zedler (jbzedler@facstaff.wisc.edu) is Professor in Botany and Aldo Leopold Chair in Restoration Ecology at UW-Madison. She and her co-authors are working to raise public awareness of stormwater issues at the UW-Madison Arboretum by inviting community volunteers to participate directly in stormwater sampling and inviting them to serve as a focus group to help develop outreach literature for the Arboretum.

Jonathan Zellmer (zellmerjon@frontier.com) has been donating volunteer effort for benefit of the McMillan Marsh State Wildlife Area since 1987.

INDEX of PRESENTERS

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Key to Common Agency Abbreviations Used in Abstracts and Bios

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
WisDOT	Wisconsin Department of Transportation