

POSTER ABSTRACTS

Southeastern Wisconsin Conservation Summit (Nov. 3-4, 2017) Forest Beach Migratory Preserve, Belgium, WI

Prevention of Turtle Road Mortality in Southeast Wisconsin

Andrew Badje (Natural Heritage Conservation Bureau, Wisconsin Department of Natural Resources)

Six species of turtles reside throughout a diverse array of wetland and upland habitats in southeast Wisconsin. Turtles, evolutionarily speaking, are one of nature's masterpieces. Having survived the age of dinosaurs, numerous ice ages, in addition to pre-settlement human cultures. Fast forward to the post World War II era, turtles are having a much harder time coping with the increasing human need for modern transportation. Road, highway, and even railroad construction poses serious threats that turtles no longer can avoid. Transportation infrastructure has enabled habitat fragmentation and the alteration of prime turtle habitat to occur on a massive scale. Additionally, direct roadside mortality of turtles is occurring at unsustainable rates in areas of high road and traffic density that intersects wetlands and adjacent uplands. The Wisconsin Turtle Conservation Program was initiated to catalogue these existing turtle crossing locations throughout the state, so that road agencies, maintenance crews, and citizen conservationists can work together to make passages safer for turtles and other wildlife. As this program is still in its early stages, we'll show you a few of the achievements and describe where the Wisconsin Department of Natural Resources plans to take the program in future years, so that we can conserve turtles for the enjoyment of future generations.

Citizens of the Rivers and Lake Monitoring Program

Z. Driscoll (Milwaukee Riverkeeper), A. Garcia (Urban Ecology Center), V. Klump (UW-Milwaukee School of Freshwater Sciences), T. Miller (UW-Milwaukee School of Public Health), C. Nenn (Milwaukee Riverkeeper), J. Orlando (Urban Ecology Center), J. Piatt (Carroll University), and T. Vargo (Urban Ecology Center)

Pharmaceuticals and personal care products (PPCP's) are emerging contaminants of concern in aquatic ecosystems. Their presence in local waterways signals societal impacts on our natural resources providing a direct link between consumerism and water quality. We have organized a pilot citizen science monitoring and educational campaign aimed at characterizing PPCPs in the Milwaukee Estuary and near shore waters of Lake Michigan. Citizen scientists were recruited through the Urban Ecology Center and Milwaukee River Keeper to sample 25 sites at multiple dates during the year including before and after Thanksgiving and Christmas. Approximately 70 PPCPs were targeted by liquid chromatography tandem mass spectrometry including antibiotics, antimicrobials, antifungals, cholesterol lowering drugs, pesticides, psychotropic medications, pain killers, opioids, illegal drugs, and active ingredients of common cooking spices. The most frequently detected compounds were pain killers, antimicrobials, antifungals, psychotropics, and caffeine. Significant temporal and spatial variability in the concentration and diversity of PPCPs was observed reflecting heterogeneity in this urban built environment.

Urban Land Stewardship at the Urban Ecology Center

K. Forbeck, M. Molter, J. C. Reinartz, J. Springsteen, J. Veglahn (Urban Ecology Center)

“Land Stewardship. Part of the Urban Ecology Center’s mission statement is to *preserve and enhance [our] natural areas and their surrounding waters and provide outdoor science education to urban youth*. The land stewardship team works to provide native plant communities, which could be found in Southeast Wisconsin pre-European settlement. These habitats include Southern Mesic Forests, Oak Savannas, Prairie, Ephemeral Ponds, and Lowland Forest. Each UEC restoration project is unique in its own way, but they all share the same goal of maintaining and restoring multiple plant communities to create a mosaic of habitats on each site.”

Cliffside Park -The Road to Restoration from Headcuts to Clay Seepage Bluffs

Dave Giordano (Executive Director, Root-Pike Watershed Initiative Network)

The implementation of Nine Key Element Wind Point Watershed Restoration Plan is bringing awareness and action to a coastal gem – Cliffside Park in Racine County. Cliffside Park includes a number of unique natural specialties not found in other places in Southeastern Wisconsin. This presentation will showcase the park’s past, present and future to include research and recommendations from the Nine Key Element Plan. There are five areas within the park that need help and Root-Pike Watershed Initiative Network has taken on the challenge to move them forward. The first project is a pre-settlement coastal wetland that we are trying to transform from its current state as fallow and tiled farmland. The second area that needs help is an eroding ravine, with two willow arrested headcuts, that dump more than 900 tons of sediment into Lake Michigan each year. The third area is the forest management around the ravine where maples load the ravine with leaves, but without native vegetation to absorb the excess nutrients. The fourth area is the need for green infrastructure within the park’s recreational areas. These impervious surfaces load the ravine with phosphorus, nitrogen, sediment and bacteria. The fifth issue area is caused by adjacent residential developments which into the park and to the ravine via surface runoff, concrete swales and storm sewers. Once these projects get completed, this area will offer a much improved migratory bird stopover, better hydrology to protect the clay seepage bluffs, more plant diversity, and the potential for fish passage up the ravine and into the park’s existing wetland. Dave Giordano, Executive Director of Root-Pike Watershed Initiative Network, will explain how we are working with Racine County, the Village of Caledonia and integrating our Respect Our Waters campaign to improve the recreational and natural experiences while reducing runoff pollution into Lake Michigan.

Wisconsin Stopover Initiative

Kim Grveles and Sumner Matteson (Wisconsin Department of Natural Resources – Natural Heritage Conservation Bureau)

Every spring and fall, tens of millions of migrating birds sweep through the Great Lakes region and stop at a variety of sites on their way to breeding grounds as far north as Greenland and the Arctic Ocean and wintering grounds as far south as Argentina’s Tierra del Fuego. These stopover sites provide birds with critical food and shelter during migration. Loss of stopover habitats poses an ongoing threat to the health and stability of migratory bird populations in the Great Lakes region. For decades, reported declines in migratory bird populations have resulted in studies focused primarily on breeding and, to a lesser extent, wintering bird populations. Only recently has serious attention been given to identifying, prioritizing and protecting migratory bird stopover sites. The Wisconsin Stopover Initiative (WISI) was launched in 2005 by the Department of Natural Resources (DNR) and The Nature Conservancy (TNC) in

order to identify and protect the places where migratory birds stop while traveling between breeding and wintering grounds in Wisconsin's Great Lakes basins. In the first few years of the project, we gathered data from experts and developed migratory bird stopover habitat models to use as tools for identifying sites. Since then, we have partnered with many agencies, organizations, and individuals to apply those tools for developing appropriate conservation actions to protect and/or enhance key stopover sites in Lake Michigan and Lake Superior coastal counties. WISI is currently reaching out to new partners to begin the work of identifying and prioritizing stopover sites along the Mississippi River in Wisconsin

Restoring Remnant Sedge Meadow Along Sucker Creek B. Bruce Krier Conservancy, Ozaukee County, WI

S. J. Hjort, C. M. Frazer, M.C. Parsons (Eco-Resource Consulting, Inc.)

Eco-Resource Consulting, Inc. (ERC) – in collaboration with the U.S. Fish and Wildlife Service, Pheasants Forever, Wisconsin Waterfowl Association, Wisconsin Department of Natural Resources, and the Natural Resources Conservation Service – is the lead ecological firm charged with planning, permitting, and implementation of a 30-acre floodplain wetland restoration along both sides of Sucker Creek at the B. Bruce Krier Conservancy in Ozaukee County, Wisconsin. Prior to restoration, the floodplain was in a degraded state from decades of adjacent agricultural practices and resulting mineral sediment accumulation and reed canary grass invasion. After conducting wetland delineations and overseeing topographical surveys of the wetland in 2011, ERC facilitated the drafting of an excavation/grading plan and oversaw the contract for the excavation of mineral soils from the wetland in the winter of 2012/2013. Several ponds were installed and planted with three types of native wetland seed mixes and approximately 8,000 native wetland sedges, rushes, grasses, and forbs in the wetland and pond shorelines. ERC has overseen invasive species management to eradicate reed canary grass and narrow-leaved cattail from the restoration area. ERC continues to monitor the hydrology and vegetation within the restoration area and floristic diversity continues to increase, with over 50 native wetland species now present. ERC also installed approximately 30 acres of mesic and wet-mesic native seed mixes into associated adjacent uplands to serve as a buffer to the wetland restoration. ERC continues to manage over 300 acres of native grass complex that is comprised within the Conservancy's holdings, and a ten-acre forested floodplain wetland that is part of the restoration area. The long-term goals for the Conservancy are to utilize the restored land for wetland science and restoration education and as a source of native seed for use on other restoration projects.

Spatial Ecology and Habitat Use of Headstarted Blanding's Turtles in Southern Wisconsin

A. Ibach, J. Mozuch (University of Wisconsin-Whitewater)

Blanding's turtle (*Emydoidea blandingii*) populations in Wisconsin have declined due to habitat destruction and high nest or juvenile predation. Headstarting (rearing of eggs/juveniles in captivity to reduce predation rates) is a conservation tool often used to offset turtle mortality in young age classes, but little is known about the habitat selection and spatial ecology of headstarted Blanding's turtles after they are released. Our goal was to obtain this information by tracking turtle movements and habitat selection with radio telemetry. We collected eggs from wild-caught females in 2012. These 19 eggs/juveniles were raised in captivity and then tracked with radio-telemetry equipment after their release the following summer. Released turtles were located once/week with radio telemetry during the active season through fall of 2016. In the summers of 2015 and 2016 we also collected eggs from

multiple females, which we incubated and hatched in captivity. Yet these hatchlings were immediately released without additional headstarting measures and tracked for the remainder of each summer (4–8 weeks/year) to assess the same parameters as with the headstarted turtles. We then compared movement and habitat used by headstarted vs non–headstarted turtles. We frequently found turtles in permanent wetlands dominated by sedge/reed canary grass. Tracked headstarted turtles had an average home range size of 16.32 Ha while non headstarted hatchling turtles were found to have an average home range of 1.31 Ha. This difference is likely due to the larger body size of the headstarted turtles and the differences in tracking periods. Overall, headstarted Blanding’s turtles seem to possess larger homeranges than non-headstarted hatchlings.

WI BBA II and the Search for Urban Birds

Maxwell Kotelnicki (Wildlife Technician, Milwaukee County Parks)

There are many stereo-types surrounding urban bird populations. Many professionals and birding enthusiasts assume the worst of urban areas due to heavy development, invasive species, lack of corridors, small habitat size, excessive human disturbance, pollution, and potentially higher levels of predation. Urban bird diversity is presumed to revolve around robust populations of house sparrows, rock pigeons, and American robins. Well the Milwaukee County Department of Parks, Recreation and Culture’s (DPRC) Natural Areas staff felt that participating in the WI Breeding Bird Atlas II was an excellent opportunity to begin assessing urban breeding bird populations and distributions within the Park System’s 9,300 acres of urban natural areas. Yes, after two years of looking (Parks didn’t participate in the first year of the Atlas) we did find plenty of house sparrows, rock pigeons, and American robins, but we confirmed breeding activities for another 88 species as well within the Park System. Local citizens have also confirmed additional species bringing the current Milwaukee County total up to 108 “confirmed” species after the completion of year three of Atlas surveys. What’s even more encouraging is that 37 of these confirmed species are listed as “priority conservation species” in Wisconsin’s All Bird Conservation Plan.

We’re not done yet, because there are currently 22 additional species that are listed as “possible” or “probable” for Milwaukee County waiting to be confirmed during the final two years of the Atlas. These surveys, while greatly enjoyed by staff, are also directly turned into on the ground bird conservation efforts improving critical urban bird habitat throughout the Park System. This presentation will delve into what staff has found and the DPRC’s bird conservation efforts to protect and improve habitat.

A Comprehensive Approach to Invasive Species Management in the Ozaukee County Park System

Tina Kroening (Ozaukee County Planning and Parks)

This poster will provide a brief overview of the Department’s methods and implementation efforts, and successes and challenges to improve the native local ecology within Ozaukee County.

Since 2007, the Ozaukee Planning and Parks Department (Department) has turned its focus to ecological improvement within the Ozaukee County Park System and Department-lead habitat restoration project sites with invasive species management at the core of its comprehensive approach. The Department owns and manages over 1,500 acres with limited staff and resources, but through a combination of private, local, state and federally secured funding the Department has increased its capacity to manage invasive species and subsequently pursue ecological and habitat restorations. Department staff are

systematically inventorying invasive species, controlling and managing invasive vegetation, removing ash trees infected by emerald ash borer (EAB) and planting native trees and shrubs to replace tree canopy and increase species diversity in the Ozaukee County Park System and on County-managed land. Invasive species management efforts allow for subsequent successful ecological restorations for native prairie and wetland projects. In addition to on the ground efforts, the Department focuses on creating and strengthening partnerships to build capacity with other organizations, conservation corps teams and volunteers. The Department provides a variety of educational opportunities to create awareness while encouraging individuals to get involved with similar activities in the Parks and on their own properties to increase the overall project impact.

Prairie, Wetland and Forest Restoration at Tendick County Nature Park

Tina Kroening (Ozaukee County Planning and Parks)

Highlighting the work within Tendick Nature Park, this poster will provide a brief overview of the Department's efforts, successes and challenges to improve the native local ecology within Ozaukee County.

Consistent with the mission to preserve and protect Ozaukee County's natural resources, the Planning and Parks Department (Department) and its partners are implementing a variety of ecological improvement projects throughout the Ozaukee County Park System and Department-lead habitat restoration projects. Improving ecological diversity provides a variety of opportunities for habitat restoration and enhancement on a larger scale. Tendick Nature Park is a 142 acre park in the Town of Saukville and boasts a variety of natural features including a pond, forested wetlands, grasslands, beech-maple forest, and riparian forest along the Milwaukee River. An analysis of Tendick Nature Park gives a comprehensive look at the variety of recent and ongoing efforts which include a 15 acre native prairie/savannah restoration, a 0.5 acre wetland enhancement, companion native tree planting focused on resilience, invasive species management and installation and monitoring of bluebird and kestrel nest boxes.

Effect of the metabolite Emodin from the Common Buckthorn (*Rhamnus cathartica*) in the structure of the amphibian community at Carroll University's Greene Field Station

David Leaders and Roberto Brenes (Department of Biology, Carroll University)

Amphibian diversity surveys at the Carroll University's Greene Field Station showed an inverse relationship between diversity and abundance of species; in other words, there are less species but in higher numbers than in surrounding areas.

The reason of this "phenomenon" is not clear and aspects like habitat loss and infectious diseases have been explored. Previous habitat surveys described large areas of the field station covered with the invasive common buckthorn (*Rhamnus cathartica*), a plant known to yield the metabolite emodin, a chemical reported to produce deformities and mortality in amphibian larvae. Our main objective for this project was to determine if there is a relationship between the presence of emodin (in the form of buckthorn) and the distribution of the existing amphibian community at the field station. Furthermore, we want to determine if there is a relationship between areas populated by buckthorn and areas optimal for amphibian development, such as temporal ponds and shallow pools, but where no amphibians have been found. To determine this correlation, we used GIS mapping to record the location

and size of available habitats suitable for amphibian reproduction and development of the larva. Currently, we are constructing maps showing the distribution of available habitat, which will later be overlaid on the maps showing the distribution of areas inhabited by the common buckthorn. To account for seasonal changes in available habitats, we collected data three times during the summer (early, mid, and late). Additionally, at each of the pools we collected water and soil samples to determine the concentration of free and trapped emodin (respectively). These samples are being currently analyzed and new maps showing concentrations of emodin on the ground or water are being created and overlay on existing maps, creating a multilayer map that shows the relationship between emodin concentrations and amphibian distribution. On our surveys, we also collected habitat variables (water quality, depth, etc.) to determine habitat preferences of the existing amphibian community at the station. Habitat models will be built using multivariate techniques. We believe that areas where buckthorn is abundant will present high concentrations of emodin and a diminished amphibian community, explaining the “phenomenon” described above. Future directions, will be to extrapolate our results to a larger scale by conducting habitat and amphibian community surveys in different areas where buckthorn is abundant.

Mapping and Monitoring Avian Resources in the Great Lakes to Support Management

Michele Leduc-Lapierre (Senior Program Specialist, Great Lakes Commission)

The Great Lakes region provides important breeding, feeding, and resting areas for many birds. Much of the coastal aquatic and terrestrial landscapes that once supported migrating birds have been lost or degraded, yet the region supports hundreds of millions of migrants during both spring and fall migration. To assist in managing these populations and conserving the habitats that support them, information on how these populations use the Great Lakes is needed. Armed with this knowledge, natural resource managers, conservationists, and other stakeholders can make better decisions in habitat restoration investments and identifying important over-lake habitats that should be protected from human impacts.

The “Mapping and Monitoring Avian Resources in the Great Lakes to Support Management” project was designed to understand how birds use the shoreline and offshore areas of the Great Lakes, and how can this information be used to evaluate the potential impact of proposed offshore wind projects and other resource management issues. Through the development of predictive models, this project will create a more comprehensive regional picture of offshore bird concentrations that will assist decision makers in identifying suitable areas for both proposed offshore wind developments and general conservation planning, relative to bird habitat and use patterns.

Then and Now: Southeastern Wisconsin Unionid Mussel Communities in the 1970's and 2016

Todd Levine (Department of Life Sciences, Carroll University) and Erin Cox (Department of Life Sciences, Carroll University)

Freshwater mussels are a critically endangered taxon with a uniquely high species richness in North America. The Wisconsin freshwater mussel fauna includes approximately 17% of the North American species. A comprehensive, state-wide survey was carried out in the 1970's by Harold Mathiak, providing an extraordinary resource and natural history reference point. In the decades since Mathiak's survey, no such survey has been undertaken. Concurrent and in partnership with a statewide survey of Wisconsin

mussel communities, we revisited 20 sites in southeastern Wisconsin that had been visited in Mathiak's survey. We used timed searches broken into segments that allowed us to calculate catch per unit effort and to conduct rarefaction to confirm species richness estimates, which differed from the methods used in the earlier surveys. Most 2016 field sites were matched precisely with those sampled by Mathiak, when that was not possible we used the nearest site. Overall, a similar number of species were recovered in both surveys (17 and 20, respectively). Substantial differences were observed between the two surveys, however simple comparisons did not reveal clear patterns. For example, species richness from the 1970's surveys was not a strong predictor of species richness in the 2016 surveys. Some notable differences include an increase in the number of sites at which we found *Pleurobema sintoxia* (+10 sites) and fewer sites with *Pyganodon grandis* (-8). Additional methods of comparing these two surveys are explored including comparing community composition by watersheds (based on hydrologic unit codes, HUC), rather than by site. Multivariate methods will also be used to compare these two surveys. While two community surveys separated by four decades is an important comparison, species-specific comparisons examining the morphology and chemical composition of shells collected in both surveys will provide an interesting comparison that more easily overcomes differences in sampling technique.

The Effects of Building Size, Window Area, and Development on Bird-Window Collisions in an Urban Landscape

K.J. McKay (BioEco Research and Monitoring Center), A.M. Carpenter, N.A. Schoefnacker, M.A. Martin, K.K. Habeck, R.T. Schmitz

Increased urban development throughout the United States has resulted in greater levels of mortality for many avian species in the form of bird-window collisions (BWCs). Current estimates of annual BWCs are very broad and often do not account for the influence of various factors such as building size, window area, window reflectivity or transmittance, proportion of development or habitat near buildings, and species vulnerability. During this project, we assessed how these building, environmental, and species factors were related to fatal BWCs. Consequently, this may help improve annual mortality estimates resulting from fatal collisions. In the fall of 2014, we documented the number of bird carcasses resulting from window collisions at six study buildings in an urban landscape on the University of Wisconsin – Platteville campus, Platteville, Wisconsin, USA. During this study, we conducted daily carcass surveys for window collision victims around the perimeter of each study building over 21 consecutive days during the fall migration season (18 September through 8 October). As a result of this project, eleven carcasses were recovered. They consisted of seven known and one unknown species. The Ruby-throated Hummingbird (*Archilochus colubris*) was the most prevalent species found. Overall, BWCs had a significant positive relationship to window area ($P < 0.05$) and building size ($P < 0.05$). There were no significant relationships between BWCs and window reflectivity, window transmittance, or land cover existing around the buildings. This project supports and adds to the current understanding regarding the impacts of large buildings with large window areas to BWCs. We recommend that further research be done to clarify the impact of window reflectivity, transmittance, and land cover types on BWCs. In order to minimize the risk of BWCs, as well as promoting avian conservation, we offered suggestions which may reduce the number of fatalities that occur due to window collisions.

Assessing Avian Species Vulnerability to Bird-Window Collisions

K.J. McKay (BioEco Research and Monitoring Center), J.T. Stader, M.C. Atkinson, A.M. Iserman, I.J. Peck, R.T. Schmitz

Bird-window collisions (BWCs) are considered to be one of the greatest human-related sources of avian mortality throughout North America. However, previous research has indicated a variety of species which appear to be more highly vulnerable to BWC mortality (e.g. American Robin, Cedar Waxwing, White-throated Sparrow, as well as a various thrush and warbler species). The objective of this study was to document which species were vulnerable to BWCs on the University of Wisconsin – Platteville Campus during the 2014 fall migration season. During this project, six study buildings on campus were monitored daily over a 21-day study period (18 September through 8 October) for the presence of window collision victims. Overall, 11 carcasses representing 7 identified and 1 unidentified species were collected among the six study buildings. Six of the species experiencing BWC mortality were Neotropical Migrants, along with a single non-migratory Permanent Resident species (i.e. House Sparrow). During this investigation, we collected no carcasses of North American Migrant species. BWC victims which were recovered during this research included: 3 Ruby-throated Hummingbirds, 2 Tennessee Warblers, and 1 each of Ovenbird, Nashville Warbler, Common Yellowthroat, Chestnut-sided Warbler, House Sparrow, and an unidentified “feather pile.” Although the majority of carcasses (9 or 82%) were Neotropical Migrants, this may be the result of the study period occurring near the peak of neotropical migration and before many North American Migrant species had begun their fall migration. The most fatalities resulting from BWCs (3) were Ruby-throated Hummingbirds, possibly due to this study taking place during the peak of their fall migration. Furthermore, in their search for nectar, hummingbirds may be attracted to landscaped flowering plants near buildings, possibly making them particularly vulnerable to BWCs

An Evaluation of Student Searcher Efficiency in a Bird-window Collision Study

K.J. McKay (BioEco Research and Monitoring Center), R.T. Schmitz

Estimates of avian mortality resulting from window collisions vary considerably due to several potential biases inherent in this type of research. One source of possible bias involves the ability of researchers to detect the carcasses of birds killed by collisions with building windows. We assessed searcher efficiency at detecting bird carcasses during an ongoing avian-window collision project on the University of Wisconsin – Platteville campus during the fall of 2015. During this searcher efficiency study, we placed bird carcasses at avian-window collision study buildings and assessed the ability of two groups of student researchers to detect these carcasses. The first group consisted of independent research students (IRS) who wanted to perform the avian-window collisions study and the second group was biology students (BIOS) working on an assigned class project as part of a required course. Test birds were categorized as easy to find, moderately easy/difficult to find, or difficult to find. Although the IRS were slightly more efficient at detecting carcasses compared to the BIOS, these differences were not significant. However, there was a significant difference based on the degree of difficulty of test birds. During this project, we discovered several factors that may account for the relatively low success rates of both groups of student researchers in detecting bird carcasses. The results of this project suggest that using “citizen scientists” for avian-window collision research may produce a substantial underestimation of the overall avian mortality resulting from window collisions. However, we certainly believe that additional research regarding the efficiency and ability of researchers to detect carcasses of avian-

window collision victims is necessary in order to better understand this potential source of bias in this type of research.

Fish and Wildlife Monitoring in Ozaukee County

Ryan Miller (Ozaukee County Planning and Parks Department)

This poster will highlight the different types of fish and wildlife and water quality monitoring efforts associated with Department-lead ecologically-focused projects, interesting findings, lessons learned, and how to get involved with citizen-based monitoring in Ozaukee County.

The Ozaukee County Planning and Parks Department (Department), through its Ecological Division has implemented a comprehensive effort to restore aquatic habitat connectivity and improve the ecological function of existing riparian habitats throughout the County portion of the Milwaukee River Watershed and Lake Michigan Basin. The Department has completed many aquatic connectivity projects including dam removals, a nature-like fishway and culvert replacements in the Milwaukee River Watershed and has been working recently on several large-scale restoration projects to convert formerly channelized streams to more functional, meandering streams for maximum ecologic productivity. Restoration of stream channels include stream remeandering, floodplain reconnection, wetland enhancement, reconnection and creation, addition of in-channel and floodplain habitat structures, native vegetation restoration, and invasive vegetation management. Restoration activities promote native vegetation diversity, provide for erosion control and stream bank stability, improve aquatic and riparian habitat, and control invasive vegetation. Pre and post restoration water quality and fish, avian, wildlife, and herptile monitoring activities by the Department play a valuable role in these ecologically-focused projects. Monitoring activities assist the Department in understanding the biodiversity before and after implementation and to understand the impact of project. These activities also support community education and engagement through volunteer monitoring opportunities. Citizen-volunteers assist in a number of ways including monitoring our underwater fishway camera at the Mequon-Thiensville dam by reporting online fish and wildlife seen going through the camera or assist in the field with electrofishing surveys and cavity nesting bird box monitoring.

The Distribution of Long-tailed Duck in Western Lake Michigan

William Mueller (Director, Western Great Lakes Bird and Bat Observatory) and B. Lenz (Director, Bird City Wisconsin; Chief Scientist, Western Great Lakes Bird and Bat Observatory)

Between 2012 and 2014, the Western Great Lakes Bird & Bat Observatory used light aircraft to survey the waters of western Lake Michigan during Phases 1 and 2 of the Great Lakes Commission's pelagic waterfowl/waterbird monitoring. Transects were flown approximately parallel to the coast, 1.6-16.0 km from the shore, and covered the area between Door County, WI and the Wisconsin/Illinois border. An additional transect was added within 1.0 km of the shore, as needed, to fully capture bird distribution.

Wisconsin Breeding Bird Atlas II – Training and Recruitment 2017

William Mueller (Director, Western Great Lakes Bird and Bat Observatory), Tom Prestby, (WBBAIL), Mike Reese (WBBAIL), and Charlie Luthin (WBBAIL)

Our goal is the recruitment of volunteers for the Wisconsin Breeding Bird Atlas II. During fall and winter, 2016, our Atlas training team reached out to potential collaborators in three areas of Wisconsin where we planned to conduct. Atlas workshops to recruit new volunteers in 2017. Our overall goal of recruiting

and training volunteer participants in the 5-year Breeding Bird Atlas was accomplished by conducting three regional training workshops throughout the state during spring 2017

Need to Ban Coal-based Blacktop Sealants to Reduce PAH's in Wisconsin Waterways

Neal O'Reilly (Conservation and Environmental Science Program, University of Wisconsin – Milwaukee), Chris Magruder (Southeastern Wisconsin Watersheds Trust, Inc. (Sweetwater))
Student Team: Katlyn Puer, Luke Webber, Michael Brennan, and Karsen Gosh

Concentrations of polycyclic aromatic hydrocarbons (PAHs), a group of organic contaminants with numerous natural and manmade sources, have increased in many urban area streambed sediments in recent decades. PAHs are formed from the incomplete combustion of organic material and are ubiquitous in the environment. Because PAHs are potentially toxic and carcinogenic to both aquatic organisms and humans the U.S. Geological Survey and the Milwaukee Metropolitan Sewerage District conducted a study of streams and potential sources of PAHs in the Milwaukee area in 2014. Multiple-lines-of-evidence were used to determine the primary source(s) of the PAHs to Milwaukee area streambed sediments. Only one source, coal tar pavement sealant, was consistently identified as the most likely and highest source of PAH contamination. Typically, coal-tar sealants are applied on parking lots, driveways and playgrounds. A team of students at UWM worked with SweetWater, USGS and Clean Wisconsin to evaluate strategies to limit the use and harmful impact of coal tar sealants. Practices evaluated include public education and outreach, institutional and governmental voluntary market place controls, voluntary supplier/contractor agreements, institutional use bans, government voluntary restrictions, public restrictive use, outright regional or statewide bans. A white paper for use by local and civic officials was prepared. To date as an outcome of the UWM student work the City of Milwaukee, the Milwaukee Metropolitan Sewerage District, Milwaukee School District and others have banned the use of coal tar sealants.

Evaluation of Wood Frog Re-introduction into the Milwaukee County Park System

Neal O'Reilly (Conservation and Environmental Science Program, University of Wisconsin – Milwaukee), Julia Robson (Assistant Natural Areas Coordinator, Milwaukee County Department of Parks, Recreation & Culture)

Student Team: (Phase 1) Justin Autz, Ryan Bross, Nicholas Halverson, Juan Orjuela, and Courtney Robertson (Phase 2) Lily Gierke, Demi Fohl, Joe Schmitz, Frank Schroyer, Katie Slater

The Milwaukee County Department of Parks, Recreation & Culture manages over 140 parks and parkways totaling nearly 15,000 acres. Within the park system 9,200 acres are managed today as natural areas. Many of these natural areas have habitat that may support Wood Frog (*Lithobates sylvatica*), however the species is very rare in Milwaukee County. It is believed that before adjacent urban development and prior use of pesticides in the Milwaukee County Park system, that Wood Frogs may have been abundant in parts of the county. This project explored the feasibility of reintroducing Wood Frog into the southern part of Milwaukee County. The project included researching Wood Frog life histories, development of a GIS based habitat suitability index, review of citizen science data from Milwaukee County Parks Amphibian Monitoring Program, identification of potential reintroduction sites, identification of potential donor sites owned by the Waukesha County Land Conservancy (WCLC),

monitoring of WCLC properties for Wood Frog population health, and identification of collection, testing, transporting and restocking techniques.

Development of Fish Habitat in the Milwaukee Harbor

Neal O'Reilly (Conservation and Environmental Science Program, University of Wisconsin – Milwaukee), and Lindsay Frost (Milwaukee Harbor District, Inc.)

Student Team: Jordan Pogorzelski, Abigail Thiermann, Veronica Lococo, Brian Jensen, and Heidi Beulen

The inner harbor of Milwaukee, also known as the “Harbor District”, has been at the center of our region’s prosperity for hundreds of years – first as a rice marsh with plentiful fish and game, then as an economic hub that served industries throughout the state. Now, much of its land sits abandoned or in disrepair, its waterways are polluted – but its potential is immense. Harbor District Inc. is working on plans to redevelop Milwaukee’s waterfront. While the harbor is still a major industrial waterway this does not mean that the waterfront cannot provide habitat for fish and aquatic life. To explore options for habitat improvement in the Milwaukee’s inner harbor, a group of students at UWM prepared a habitat guide for use by individuals that are redeveloping the Harbor District. The guide identifies fish species that inhabit the harbor and use it to move from Lake Michigan up into the Milwaukee River. The guide identifies habitat requirements for foraging, spawning and passage, and identifies a series of artificial habitat structures that can be used in this very modified environment.

Wisconsin Frog and Toad Survey

Rori Paloski (Bureau of Natural Heritage Conservation, Wisconsin Department of Natural Resources)

The Wisconsin Frog and Toad Survey (WFTS) was created in 1981 in response to suspected declines in several Wisconsin frog species, primarily Blanchard’s cricket frogs (*Acris blanchardi*), northern leopard frogs (*Lithobates pipiens*), pickerel frogs (*Lithobates palustris*) and American bullfrogs (*Lithobates catesbeianus*). The survey has now been in place for over 35 years and is one of the longest running amphibian monitoring programs in North America. The goal of the survey is to document the relative abundance and population trend of the state’s 12 frog species. The Department of Natural Resources coordinates the survey however the data are collected almost entirely by citizen scientists. Each citizen scientist is assigned a pre-defined route with 10 sites. At each site, a 5 minute breeding call survey is conducted and the relative abundance of each species is recorded. Surveys are conducted three times per year, once during each survey period (April 15-30, May 20-June 5, and July 1-15). Over 180 routes have been established throughout Wisconsin, with almost 20 routes in southeastern Wisconsin. Statewide survey results to date show a decrease in several species, including the state endangered Blanchard’s cricket frog, northern leopard frog and pickerel frog. However, several habitat generalists, such as the American toad (*Anaxyrus americanus*) and chorus frog (*Pseudacris maculata*), appear to be relatively stable. A recent addition to the WFTS has been the creation of phenology surveys, which allow citizens to monitor one pond or wetland throughout the summer to determine starting and ending dates for each species’ calling period. Phenology survey data allow biologists to better understand how frog species are responding to changing environmental conditions and can be used to inform future conservation, management and regulatory decisions.

Bird Use of the Cedarburg Bog Important Bird Area during Spring and Fall Migration

Victoria D. Piaskowski (Friends of the Cedarburg Bog), John M. O'Donnell (Friends of the Cedarburg Bog), and Gretchen A. Meyer (University of Wisconsin-Milwaukee Field Station)

We studied bird use of three habitats within the Cedarburg Bog Important Bird Area during spring and fall migration. Weekly migration point counts were conducted for three years in the forested portions of the Cedarburg Bog, the adjacent Upland Habitat (including the Cedarburg Beech Woods, plus open fields and forest patches at the UWM Field Station) and on Mud Lake, the largest lake within the Cedarburg Bog. A total of 189 bird species was detected in the three habitats combined. Of these, 135 species were detected in the Bog, 117 species were detected in the Upland Habitat and 174 species were detected in the Mud Lake habitat. Sixty-two species (32.8% or nearly 1/3 of the total) are listed as being of conservation concern in Wisconsin and national plans, emphasizing the importance of this large protected area to birds during spring and fall migration.

Population Dynamics of the Masked Shrew (*Sorex cinereus*) in Southern Wisconsin

Karina S. Rebman, Jarod Lorenz, Joshua M. Kapfer (Department of Biological Sciences, University of Wisconsin-Whitewater)

Limited data exists on the ecology of the Masked Shrew (*Sorex cinereus*) in Wisconsin, including information on population density, sex ratios, morphological measurements, and patterns of activity. In an effort to expand knowledge on this subject, we surveyed two sites with drift fences (two drift fence arrays/site) in 2013 and 2014 in Walworth and Jefferson county in southeastern Wisconsin. We used drift fence traps to direct shrews toward funnel traps; we checked traps every 24 hours Monday through Friday from late April to the beginning of November. We selected two survey sites with similar habitats to compare to population information. We tallied the number of shrews captured by month, while also determining shrew sex and recording body length/weight. We estimated shrew density by relating the numbers captured to survey area, which was calculated based on drift fence area. We captured a total of 174 shrews across both sites over the two years. The estimated monthly population density resulted in 0.00-0.022 shrews per meter², over time, but showed substantial fluctuations from month to month at each location. We found that average body mass per year and per location varied slightly, from 3.65±1.07g to 3.49±1.60g over the two years in Walworth County, and from to 3.57±1.31g, to 3.11±1.25g in Jefferson county. We also observed that shrew capture rates increased from spring to summer of each year. Although analyses are ongoing, the variation in population sizes over time could support that Masked Shrew populations are highly dynamic and naturally fluctuate due to seasonal and random environmental changes. Furthermore, seasonal variation in capture rates provide information on peak periods of activity for this species in Wisconsin.

The Natural Heritage Inventory – What it is and Why it is Important

Richard Staffen (Conservation Biologist, WDNR Bureau of Natural Heritage Conservation)

The Natural Heritage Inventory (NHI) was established by the Wisconsin Legislature in 1985 to be the central repository for information on location and condition of at-risk species and high-quality natural communities. Natural Heritage Inventory data follow a rigorous set of biological inventory and data

management standards and protocols to provide the most complete and up-to-date conservation database available in Wisconsin.

To further partnerships with local conservation organizations in southeast Wisconsin it is our hope to raise awareness of the importance of contributing rare species data to NHI, how this information can be accessed by all, and how it is being utilized now and in the future for the conservation of native biodiversity.

Cavity Nesting Bird Box Installation and Monitoring Efforts throughout Ozaukee County

Andrew Struck (Ozaukee County Planning and Parks Department)

The Ozaukee County Planning and Parks Department (Department) has been installing and monitoring a variety of avian nest boxes throughout Ozaukee County-owned and co-managed lands in conjunction with several small and large scale habitat improvements projects. Boxes have been installed specifically for American kestrels, eastern bluebirds and wood ducks and a tower was built for chimney swifts. The boxes and tower provide critical roosting and nesting habitat for cavity nesting birds as natural habitats and populations decline. Department staff with the assistance of citizen-volunteers have been monitoring the boxes and collecting data on species specific use of the boxes and nesting success. The nest box monitoring is complimented with additional bird-point count surveys that provide information on breeding and migratory bird species utilizing County-owned and Department-lead habitat restoration project sites before and after habitat enhancement implementation. This monitoring provides a unique opportunity to engage the public and create awareness about the native local ecology and threats posed by habitat impacts. For example, educational signage is being created for the chimney swift tower, a large and prominent structure within Virmond County Park, that is also being artistically enhanced. This poster will provide information about the Department's bird box monitoring efforts throughout the County, associated habitat restoration projects, citizen engagement, implementation successes and lesson learned.

Migration Monitoring of Passerines and Near-passerines at Forest Beach Migratory Preserve (2014-2017)

Jana M.G. Viel (Western Great Lakes Bird & Bat Observatory), and Alan M. Sherkow, Victoria D. Piaskowski, Stephanie Beilke, William P. Mueller.

In the fall of 2014, the Western Great Lakes Bird and Bat Observatory (WGLBBO) established a migratory bird banding operation at the Forest Beach Migratory Preserve (FBMP) near the coast of Lake Michigan in Belgium, WI. The goals of this project are to: 1) evaluate the habitat use of migrating birds at a unique site that has undergone restoration specifically to attract migratory birds, 2) contribute local data on migratory phenology, species richness and abundance, and physiology (such as measurements of body fat) to a larger collection of mist netting data in the coastal Great Lakes region, and 3) provide guidance for future conservation and management decisions at FBMP and beyond. During 2016 we added grassland nets and also extended our banding to include the June and July breeding season. Over the first eight seasons of data collection, we conducted passive mist netting in woodland, shrub, wetland, grassland and edge habitats. As the operation is still in a growth period, we typically operated 4-5 mist nets a day, twice per week. We will use the results of this study to guide the expansion of the banding operation at Forest Beach to include more mist net locations. In addition to banding we are conducting

training of additional banders and volunteer assistants. We will also use our operation to collect additional data for, and collaborate with, other researchers when the opportunities present themselves.

GIS-Based Ecological Prioritization Tool Overview and Application

Karina Ward (Ozaukee County Planning and Parks Department)

Ozaukee County's natural and cultural resources are of immeasurable value. Over 125 miles of perennial streams, 185 miles of intermittent streams, and 36,000 acres of forests and wetlands contribute to water quality and support the health, economy, and recreational opportunities of communities and residents as well as native plants, fisheries, animals, and birds. 25 linear miles of Lake Michigan shoreline consist of clay bluffs reaching up to 140 feet tall, ravines, gently rolling beaches up to 150 feet wide, and areas of low sand dune ridges and swales. Ozaukee County is home to 32 historic sites listed on the National Register of Historic Places, including numerous shipwrecks in a proposed National Marine Sanctuary. Development, farming, and other land uses put pressure on these ecological and cultural resources and their protection is critical to supporting the County's growing population and developing a strong economy.

When financial resources are limited, it is imperative to be able to compare potential projects in a wide variety of locations and settings in order to determine where funding will have maximum ecological benefit. A project on a small parcel in an urbanized area may be under consideration at the same time as a project on a large tract of agricultural land. To make such comparisons possible, the Ozaukee County Planning and Parks Department recently created an innovative, data-driven tool to prioritize individual parcels for preservation and restoration activities. The tool uses GIS-based modeling to combine an extensive list of data and creates a series of output maps to guide decision-making.

This poster will introduce Ozaukee County's Ecological Prioritization GIS Tool, discuss the data sources and methods used, and share how the tool was used to inform the acquisition of the County's newest park: Clay Bluffs Cedar Gorge Nature Preserve and pilot work in Mequon through the Mequon Preservation Partners.

Mapping Freshwater Mussel Distribution and Habitat Needs in Southeastern Wisconsin

Jesse Weinzinger (Wisconsin Department of Natural Resources)

Freshwater mussels play a significant role in aquatic ecosystems, filtering water, churning substrate and providing food and shelter to other organisms. They are also sensitive to declines in water quality and habitat conditions making them good indicators of stream health. Habitat and nutrient loading conditions that adversely affect mussels also usually have the same negative effect on fish host populations that mussels depend upon for the dispersal of glochidea. Of the 51 mussel species in the state of Wisconsin, nearly 50% are listed as rare or declining. Discover what conservation actions the Wisconsin DNR is taking to identify threats to freshwater mussels and preserve these critical factors for ecosystem health.

Advancing Conservation in the Lake Beulah Community

Maggie Zoellner (Kettle Moraine Land Trust)

The Kettle Moraine Land Trust (KMLT) has taken up the work of considering conservation opportunities and challenges in the Lake Beulah watershed of Walworth County. The KMLT's vision for this effort is that land deemed vital to the ecological health of the watershed and viewed as significant to local residents, and is endorsed by community leaders for permanent protection. Through collaborative identification of lands with significant natural resource values, both human and ecological communities in the Lake Beulah Watershed and nearby areas will benefit.

Community stakeholder goals were identified through meetings and by data collected via a short survey that area residents completed. The survey evaluated residents' views on conservation priorities and environmental challenges. This information was then incorporated into a Geographic Information Systems (GIS) model developed by graduate students from UW-Milwaukee, along with the KMLT selection criteria for conservation projects. The model considers each land parcel in the Lake Beulah watershed and assigns a numerical ranking according to how it fits KMLT selection criteria and the community stakeholder goals. The criteria/goals included: Critical Species Habitat Sites, Significant Natural Areas, number of acres, lakeshore habitat, in primary environmental corridor, groundwater recharge areas, riparian corridors, presence of multiple habitat types, and presence of rare species. 2,048 tax parcels underwent the analysis that considered 12 characteristics of the properties and prioritized the properties by how well they would satisfy KMLT's mission if permanently protected.

221 parcels are considered to have conservation value, 56 of these are of significant size to warrant conservation (at least 10 acres), or of very high ecological value. After an initial review, approximately 30 of these high interest conservation properties could undergo further development according to the current zoning regulations, thereby warranting even greater consideration by KMLT.