Ohio Natural History Conference

February 15th, 2014

Ohio History Center, Ohio Historical Society
Columbus, OH

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Conference Schedule

(Presenters only are listed on the schedule. See abstracts for a complete list of authors.)

8:30	Refreshments and Registration; Set-up posters
9:00	Welcome and Announcements
9:15	**Keynote Presentation** – Gene Kritsky, College of Mount St. Joseph "Applying natural history"
10:15	Award Presentations
10:30	Break
	Paper Session I
10:40	"Employing *Lights Out* programs to reduce bird collisions: results from the *Lights Out Columbus* monitoring program" – Amanda Duren, Ohio Bird Conservation Initiative
11:00	"The present status of Ohio's timber rattlesnake" – Doug Wynn, The Ohio State University
11:20	"Bee diversity and floral constancy in Washington County, Ohio" – MaLisa Spring, Marietta College
11:40	"Understanding combined effects of white-tailed deer and exotic earthworms on understory plant communities in northeast Ohio" – Ryan Trimbath, University of Akron and Metroparks, Serving Summit County
12:00	Lunch (The Plaza Terrace); View Museum exhibits
1:00	**Poster Session**, with authors in attendance (The Plaza Terrace)
1:30	**Special Lecture** – Harvey Webster, Cleveland Museum of Natural History "Of mast and men: the life, times, and demise of the Passenger Pigeon"
2:30	Break
	Paper Session II
2:40	"The creation, implementation, and value of experiential learning opportunities in undergraduate classrooms" – Sarah Minter, Shawnee State University

3:00	"Road salt pollution increases tadpole growth but decreases post-metamorphic survivorship in wood frogs (Rana sylvatica)" – Kacey Dananay, Case Western Reserve University
3:20	"Effects of historic strip mining on terrestrial salamander diversity in Tuscarawas County, Ohio" – Joseph Brady, New Philadelphia High School
3:40	"White-tailed deer doe movement and fawn survival in an urban park system" – Sara Kennedy, The Ohio State University and Cleveland Metroparks
4:00	"Freshwater mussels in Lake Erie: What remains 25 years after the dreissenid invasion?" – Robert Krebs, Cleveland State University
4:20	Closing Remarks and Adjournment

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Speaker Presentations (arranged in presentation order; see schedule)

"Applying Natural History"

Gene Kritsky / College of Mount St. Joseph

Abstract: Natural history is more than a field of knowledge; it has inspired the development of our cultures and early technologies. Fundamental aspects of insect development and behavior have influenced Egyptian, Greek, and Hopi myths (among others), and these cultures adapted insect natural history to develop new technologies and industries that changed their societies. The history of apiculture provides a case study of how people have applied honey bee biology to develop new methods of increasing honey and wax production over the past four millennia. Some of these methods (those not based on sound natural history) failed, while others improved apicultural practices. Natural history continues to provide insights that may lead to new applications in engineering and medicine.

Author Bio: Gene Kritsky, a native of North Dakota, received his B.A. in Biology from Indiana University in 1974, and his M.S. and Ph.D. in Entomology from the University of Illinois in 1976 and 1977, respectively. A former Fulbright Scholar to Egypt, he has been teaching at the College of Mount St. Joseph since 1983.

"Employing *Lights Out* Programs to Reduce Bird Collisions: Results from the *Lights Out Columbus* Monitoring Program"

Amanda Duren / Ohio Bird Conservation Initiative

Abstract: Every spring and fall, millions of birds migrate through Ohio on their way to or from their breeding grounds. Many birds migrate at night, and lights on tall buildings or aimed at the sky can disorient them and draw them into the buildings. Building collisions are a leading cause of bird fatality in North America, estimated to kill 550 million birds each year. Lights Out programs provide an opportunity to reduce collisions by working with building owners and managers to reduce lighting at their buildings. In 2012, Lights Out Columbus was initiated through a partnership led by the Ohio Bird Conservation Initiative and the Grange Insurance Audubon Center. A volunteer-based monitoring program was developed to collect data on bird collisions and lighting from buildings in downtown Columbus during peak bird migration periods to help guide the implementation of Lights Out Columbus. During peak bird migration periods in 2012 and 2013, morning surveys for bird collisions and nighttime surveys for lights were conducted by trained volunteers along the survey route in downtown Columbus. The number of birds found at a building was positively correlated with the building's average light index ($R^2 = 0.72$, $t(19) = 2.61$, $p = 0.000$). This finding supports the need for Lights Out programs to guide building owners, managers, and residents in reducing nighttime lighting. In addition to reducing energy usage and associated costs, our data show that efforts to reduce nighttime lighting on buildings could reduce the number of migratory birds killed by building collisions.

Author Bio: Amanda Duren received a B.S. in Environmental Resource Management from Penn State University in 2007 and a M.S. in Wildlife Ecology from the University of Delaware in 2011. For her graduate work, she studied the impacts of non-native plants on bird populations in suburban forest fragments. After moving to Ohio in 2011, she worked as a research assistant for Ohio State University surveying birds as part of the Ohio Breeding Bird Atlas II. She's currently employed as the Program Coordinator for the Ohio Bird Conservation Initiative. The duties of her position include the development of partnership projects among public and private conservation organizations and the coordination of avian education activities in Ohio.

"The Present Status of Ohio's Timber Rattlesnake"

Doug Wynn / The Ohio State University, Department of Evolution, Ecology and Organismal Biology

Abstract: Timber Rattlesnake studies were initiated in Ohio in 1989 when the Division of Natural Areas and Preserves funded projects to collect data from the Tar Hollow and Shawnee State Forests. Studies have continued every year since and as sample sizes have increased to 665 Timber Rattlesnakes, most basic natural history facts have changed considerably. This species has now been documented from eight counties within the last five years. Approximately 65 dens are now known. They are found on every aspect, rocky ledges are rare, and in some cases no rocks are visibly present. Males average 101 cm in length (47-135) and females 85 cm (45-118). Newborns (n=47) average 31.6 cm (23.0 – 42.3) in length and have an average weight of 29.1g (10.3-44.0). Births have occurred between August 22 and September 27. The average litter size (n=12) is only 6.6. Some aspects of their biology still remain unanswered since recaptures are rare. For example of the 665 encounters, fourteen are recaptures. Data has been provided to other workers and their results are pending. These include population viability modeling, population genetic work, and GIS modeling. Populations continue to be impacted by poaching, intentional killing, accidental killings, and habitat destruction and incompatible management practices from logging.

Author Bio: Doug Wynn is a retired high school ecology teacher. As a result of his fourth grade teacher he has a special interest in snakes and has been studying them since his undergraduate years. Doug is especially interested in Ohio's endangered snakes and has conducted projects for the Ohio Department of Natural Resources since 1987. The Ohio Division of Parks presented Doug with their Naturalist Award in 1994 and in 2000 his high school students and he received a special award from the Ohio Division of Wildlife. He also received the Ohio Biological Survey's 2010 Naturalist Award and the Ohio Division of Wildlife's 2011 Conservationist Award. In 2006 Doug and Scott Moody authored an "*Ohio Turtle, Lizard, and Snake Atlas*." Doug recently co-edited and co-authored the 2013 *Amphibains of Ohio* and is presently co-authoring and co-editing the companion volume *Reptiles of Ohio* which is being published by the Ohio Biological Survey, Inc. His work in the field continues to focus on Timber Rattlesnakes, Plains Gartersnakes, and Eastern Massasauga Rattlesnakes.

"Bee Diversity and Floral Constancy in Washington County, Ohio"

MaLisa Spring, Katy Lustofin, and Dave McShaffrey / Marietta College, Department of Biology and Environmental Science

Abstract: We examined the bee populations and diversity in Washington County, Ohio and the pollination services contributed by each species as denoted by the pollen found on the scopa. Lack of information about bee populations makes it difficult to notice change in populations. Furthermore, not many studies have examined the pollen collected by each individual bee. We looked at bees at three sites in Washington County to get a better idea of the diversity present. Bees were collected every two weeks from April 2013 to October 2013 using pan traps as well as occasional supplemental vane traps and sweepnetting. A total of 2,756 bees were collected and identified to genus, and if possible, species. Over 33 genera of bees were collected representing over 55 species in five families. The most common genera were Andrena, Osmia, Lasioglossum, and Ceratina. Over 80 bees had visible pollen loads; the pollen was identified to family. Pollinator constancy was determined by evaluating the different types of pollen collected on each individual. Most of the pollen samples were from Andrena spp. with more pollen constancy in the first sample date of April 21st when Claytonia virginica is present. On later dates Andrena was much less constant, collecting several different types of pollen. We provide a baseline understanding of our current bee populations in SE Ohio as well as insight into the pollination services of each bee species. This data contributes to nationwide research about the current status of bee populations.

Author Bios: MaLisa Spring is a Biology major at Marietta College. She will be going to graduate school in the fall of 2014 for a Master of Science in Entomology.

Dr. Katy Lustofin is an assistant professor of biology at Marietta College whose research interests include bees and millipedes.

Dr. Dave McShaffrey is professor of biology and environmental science at Marietta College whose research interests include use of benthic macroinvertebrates as indices of water quality, distribution and ecology of Chironomidae, functional morphology of aquatic invertebrates, biogeography of Odonata, and other stuff.

"Understanding Combined Effects of White-tailed Deer and Exotic Earthworms on Understory Plant Communities in Northeast Ohio"

Ryan J. Trimbath[1,3], Colin Cope[2], Rob Curtis[3], and Gregory A. Smith[1] / [1]University of Akron, Department of Biology; [2]Case Western Reserve University, Department of Biology; [3]Metroparks, Serving Summit County

Abstract: Temperate forests of North America are being altered by the combined effects of two ecosystem engineers, white-tailed deer, *Odocoileus virginianus,* and exotic earthworm species from Europe and Asia. Deer have been in the cross hairs since populations have grown to a nuisance level due to management and the loss of top-predators like wolves. The intense pressure of herbivory from white-tailed deer alters the structure, abundance and diversity of plants in the forest. Earthworms change the physical and chemical attributes of forest soils, and alter plant-soil interactions which have been suggested to facilitate changes in understory plant communities. Past studies suggest earthworm impacts are similar to that of white-tailed deer including the overall reduction understory vegetation

and the loss of native biodiversity. These species frequently co-occur yet currently, there have been no attempts to understand the combined effects of these taxa on forest plant communities. My research utilized deer exclosures throughout Northeast Ohio to isolate the impacts of exotic earthworms from those of overabundant deer populations and elucidate how these taxa interact to shape our forest communities. Additionally, this research will help land managers understand how plant communities in earthworm invaded forests will respond to deer management.

Author Bios: Ryan Trimbath is a graduate student in biology at the University of Akron being supported through an Industrial Assistantship via Metro Parks Serving Summit County. After graduating with a B.S. in Wildlife & Conservation Biology from Ohio University Ryan has worked as a field biologist throughout Ohio as well as projects in Maryland, New Hampshire, Wisconsin and Oregon with a focus on Forest and Avian Ecology.

Colin Cope is a PhD student at Case Western Reserve University. Colin is interested in biological invasions and is studying the effects of exotic earthworms on mycorrhizal communities.

Rob Curtis is a Biologist at Metro Parks Serving Summit County focused on conducting ecological inventories throughout the park district. Rob is an active member in the Lake Erie Alleghaney Partnership (LEAP) and committed the conservation of regional biodiversity. He is also active in promoting the use of iNaturalist as a conservation tool.

Dr. Greg Smith is on the Graduate Faculty in the Department of Biology at the University of Akron. He also serves as Executive Director of the Ohio Biological Survey.

"Of Mast and Men: The Life, Times and Demise of the Passenger Pigeon"

Harvey Webster / Cleveland Museum of Natural History

Abstract: 200 years ago, the Passenger Pigeon was thought to be the most numerous species of bird on earth, accounting for 25% of all birds in North America. Frontier descriptions of flock size defy imagination. Flocks darkened the skies for days on end in migration. Nesting colonies could occupy 50 square miles. And yet 100 years ago, on September 1, 1914, 'Martha' the last Passenger Pigeon fell dead off her perch at the Cincinnati Zoo and with that, the species was extinct.

Author Bio: Harvey Webster is the Director of Wildlife Resources at the Cleveland Museum of Natural History.

"The Creation, Implementation, and Value of Experiential Learning Opportunities in Undergraduate Classrooms"

Saran Minter / Shawnee State University, Department of Natural Sciences

Abstract: Authentic experiences for teaching science are being increasingly advocated and incorporated into curricula. Historical paradigms of educational environments are facing increased

pressure as institutional focuses shift from the traditional delivery of knowledge via lectures towards the fostering of active learning through authentic experience. Experiential learning theory has been studied in various contexts. Conceptually, active experiences promote a deeper, more natural way of gaining knowledge compared to learning a subject second hand. The relative authenticity of an experience plays a role in learning achieved. As the goals of scientific endeavors are to acquire and explain processes of nature, open-ended approaches should be superior to laboratory activities with predetermined outcomes in instilling an appreciation for the scientific process. Such goals can be reached through a multiplicity of techniques. An example, discussed herein, is the incorporation of a small mammal survey experiment into an upper-level biology course at Shawnee State University. Students enrolled in the course received training, identified and established field sites, and were responsible for the collection of scientific data over a twelve week period. Modifications to the experimental procedure were made as necessary throughout the semester following group discussions involving all participants. The survey experiment occurred in Shawnee State Forest, Portsmouth, Ohio during the fall 2013 semester. Upon the completion of the project, student learning was assessed by field journals, data sheets, and individualized summaries. Student collected data subsequently served as preliminary evidence for the modification of and continuation of the survey by undergraduate research students into 2014.

Author Bio: Sarah Minter is an Assistant Professor of Biology at Shawnee State University where she teaches courses focuses on organismal biology and advises undergraduate research students. She received her PhD in Entomology from the University of Kentucky in 2011.

"Road Salt Pollution Increases Tadpole Growth but Decreases Post-metamorphic Survivorship in Wood Frogs (*Rana sylvatica*)"

Kacey L. Dananay and Michael F. Benard / Case Western Reserve University, Department of Biology

Abstract: To halt the loss of biodiversity, it is important to understand the effects of anthropogenic disturbance on ecological communities. One pollutant that is increasingly recognized as a threat to the environment is road salt. Road salt is the most common de-icing agent and may contribute to some amphibian declines. Multiple studies have shown road salt decreases survival, growth and development of amphibian eggs or tadpoles. Most studies on road salt are conducted in laboratory conditions and are confined to the tadpole stage, thus potentially missing effects that are mediated through other species in the aquatic community or that are incurred after metamorphosis. We conducted two experiments to test the effect of realistic concentrations of road salt on wood frogs (*Rana sylvatica*) over multiple environments and life-stages. Road salt did not affect tadpole survivorship but did slow development and increased growth. Road salt also reduced zooplankton abundance, but increased algal growth. Increased algal growth may benefit tadpoles by increasing food resources and may be a result of reduced zooplankton abundance. Additionally, exposure to road salt caused tadpoles to metamorphose at a larger size. After metamorphosis, juvenile frogs were moved into outdoor terrestrial pens and were raised in high and low density treatments for approximately 18 weeks. Exposure to road salt during the tadpole stage increased mortality among terrestrial, juvenile frogs in high density treatments. These results suggest that we may be underestimating the effect of

environmental pollutants when focusing only on one life stage or conducting experiments solely in laboratory settings.

Author Bios: Kacey L. Dananay is a PhD student in the Biology Department at Case Western Reserve University, and graduated in 2013 with a M.S. in Wildlife and Fisheries Sciences from The Pennsylvania State University. Her research interests focus around human-wildlife interactions and environmental pollutants. For her M.S. research, she investigated the morphological and physiological effects of ecological light pollution on mammal and amphibian populations. Her current research is centered on the effects of road salt runoff on amphibians focusing on aquatic-terrestrial linkages.

Michael F. Benard is the George B. Mayer Assistant Professor of Biology at Case Western Reserve University. His research investigates how amphibians and other organisms respond to natural and anthropogenic environmental change. He earned his B.S. in Biology from Cornell University, his PhD from the University of California, Davis, and was a Michigan Fellow at the University of Michigan before joining the faculty at Case Western Reserve University in 2008.

"Effects of Historic Strip Mining on Terrestrial Salamander Diversity in Tuscarawas County, Ohio"

Joseph K. Brady / New Philadelphia High School

Abstract: Historic patterns of land-use can have a strong influence on the distributions of species, and salamanders, which tend to have a narrow range of ecological tolerance, may be particularly susceptible to habitat modifications resulting from these disturbances. I compared salamander diversity between forests growing atop pre-1972 un-reclaimed strip mines (n=5) to similar aged forests without a history of strip mining (n=5) in Tuscarawas County, Ohio, using time constrained, transect searches during the fall 2012 and spring 2013 seasons. The survey revealed 1480 salamander individuals, representing 11 different species. Salamander species richness was higher in forests without a history of strip mining (mean species richness = 7.0 $\pm$ 1.2 SD) than in mined forests (mean species richness = 4.2 $\pm$ .45 SD; T-test, p = 0.0014), although this difference was attributable to the complete absence of stream-dependent species in the mined forests. Mean numbers of salamander individuals encountered did not differ between un-mined and mined forests (143$\pm$42 SD and 153$\pm$101 SD individuals, respectively; T-test, p = 0.84). The survey revealed new county records for *Ambystoma jeffersonianum* and *Hemidactylium scutatum*. This survey suggests that un-reclaimed strip mines can provide suitable habitat for many of Ohio's terrestrial salamanders, but water quality may limit the colonization of these sites by stream-dependent forms.

Author Bio: Joseph K. Brady has taught biology and chemistry at New Philadelphia High School for 14 years. Over the course of his career, Mr. Brady has worked to engage students across a wide range of age groups in authentic studies of local forest ecosystems. The salamander survey detailed here involved the collaboration of students and teachers from elementary, middle, and high school grade levels and was funded by Ohio Environmental Education Fund Grant S12G-048.

"White-tailed Deer Doe Movement and Fawn Survival in an Urban Park System"

Sara Kennedy[1,2], Terry Robison[2], and Stan Gehrt[1] / [1]The Ohio State University, School of Environment and Natural Resources; [2]Cleveland Metroparks

Abstract: The white-tailed deer is a challenging wildlife species to manage in metropolitan landscapes, often reaching densities which exceed cultural and ecological carrying capacities. Cleveland Metroparks implements a population model to guide annual management efforts to reduce deer densities. However, two elements of the model lacking robust estimates are fawn survival and migration. To develop better estimates of these elements, we initiated a multi-year study to quantify doe movement and fawn survival. Twenty-one adult deer were captured using Clover traps and drop nets during winter and spring 2012 and 2013. Mature pregnant does received a radio collar and vaginal implant transmitter. Young does received a microchip and ear tags only. Thirty-one neonatal fawns were hand-captured and fitted with expandable radio collars. Four fawns were associated with collared does; the remainder were found during dedicated searches or reported by landowners. At six months from birth, we recorded seven fawn mortalities and seven shed collars. Three mortalities were deer-vehicle collisions; two were starvations, and two were predations. Average six month survival was 71%. Tracking of collared animals continues, and analysis of movement and home range is ongoing. Collared does show similar home ranges before and after parturition, but a range contraction occurs during the two-week period immediately before and after parturition. Fawns associated with collared does maintain home ranges contained within their dam's home range. Deer living primarily in residential areas appear to maintain smaller home ranges than deer living primarily in natural areas.

Author Bios: Sara Kennedy is currently a graduate student in the School of Environment and Natural Resources at the Ohio State University. She is pursuing a M.S. in Fisheries and Wildlife Science, focusing on predator-prey relationships in urban parks. She was previously the Wildlife Research Coordinator at Cleveland Metroparks.

Dr. Terry Robison is the Director of Natural Resources at Cleveland Metroparks. He was formerly a research scientist with MeadWestvaco Pulp and Paper Company.

Dr. Stan Gehrt is an Associate Professor of Wildlife Ecology in the School of Environment and Natural Resources at the Ohio State University. His research focuses on urban ecology of carnivores and their prey.

"Freshwater Mussels in Lake Erie: What Remains 25 Years After the Dreissenid Invasion?"

Robert A. Krebs[1], David T. Zanatta[2], Jonathan M. Bossenbroek[3], Lyubov E. Burlakova[4], Todd D. Crail[3], Ferenc de Szalay[5], Traci A. Griffith[2], Doug Kapusinski[5], Alexander Y. Karateyev[4], Elizabeth S. Meyer[6], Wendy L. Paterson[2], Trevor J. Prescott[1], Matthew T. Rowe[2], Don W. Schloesser[7], and Mary C. Walsh[6] / [1]Cleveland State University, Dept. of Biological, Geological, and Environmental Sciences; [2]Central Michigan University, Institute for Great Lakes Research, Biology Department; [3]University of Toledo, Dept. of Environmental Science, Lake Erie Center; [4]SUNY Buffalo State, Great Lakes Center;

[5]Kent State University, Dept. of Biological Sciences; [6]Pennsylvania Natural Heritage Program, Western Pennsylvania Conservancy; [7]U.S. Geological Survey, Great Lakes Science Center

Abstract: Over the past 25 years, unionids in the Great Lakes have been under 'attack' by dreissenid mussel colonization which directly (e.g., attach to unionid shells) and indirectly (e.g., eat foods of unionids) have caused severe mortality. However, several refuges have also been found where unionids appear to survive in the presence of dreissenid mussels. This study developed systematic methods to assess known and possible additional unionid refuges in order to develop predictive models which can be used to locate other refuges where unionid surveys were not performed. We discovered several unionid refuges in lakes St. Clair and Erie and connecting channels, documented species abundance and diversity of these refuges, and classified known refuges by their priority to preserve healthy unionid populations. The highest quality assemblages (i.e., true refuges from impacts of dreissenids) appear to be concentrated in the St. Clair delta, a select few coastal wetlands and drowned river mouths in the western basin of Lake Erie, and in Thompson Bay at Presque Isle. Results of the present study indicate unionid refuges have persisted in the Great Lakes for at least 25 years, and newly discovered refuges indicate there are probably more at, as yet, unknown locations. In addition, at least one species, *Leptodea fragilis*, continues to persist in Lake Erie in good numbers, and a handful of others exist at very low densities.

Author Bios: The above group, all interested in the conservation of native freshwater mussels in the Unionidae, formed the Great Lakes Unified Malacologists in Feb. of 2011. The plan was to assess, as a group, the extant mussels at a scale that no one lab could handle, a survey of the lower Great Lakes. The above abstract announces the first results on Lake Erie and Lake St. Clair, led by Zanatta and Krebs, which will be followed with modeling tested in Lake Ontario by Bossenbroek and an exploration of the direct impacts of Dreissenids by Burlakova and Karateyev, with support from a diverse group of coauthors.

Poster Presentations (arranged alphabetically by last name of first author)

"Influences on Midwestern Breeding Bird Occupancy: Matrix Versus Habitat"

Bryce T. Adams and Karen V. Root / Bowling Green State University, Department of Biological Sciences

Abstract: The rate of future change in habitat is unlikely to exceed changes to the matrix for human-dominated landscapes as most habitat is already lost or protected. We tested the implications of future matrix change relative to habitat loss and fragmentation by extensively surveying midwestern breeding bird species in a mixed-disturbance biodiversity hotspot, the Oak Openings Region of northwestern Ohio, USA, from 23 May – 2 July 2013. We modeled occupancy for several species after controlling for detection bias, individual species responses to spatial-scale, and site variables. While we detected modest effects of habitat loss and fragmentation, occupancy rates were strongly influenced by deteriorating matrix quality, and responses were generally negative. Our findings support the notion

that spatial distributions of midwestern breeding birds are influenced by the matrix, and in highly modified landscapes, the relative influence of these effects are large compared to habitat loss and fragmentation. We recommend conservation strategies that focus efforts on improving matrix quality.

Author Bios: Bryce T. Adams is a MS candidate in the Department of Biological Sciences at Bowling Green State University. He is interested in understanding the effects of land use and environmental change on bird populations at multiple spatial scales. As a graduate student, he has sought to contribute to general ecological theory and to also generate a better understanding of how spatial ecology and its concepts can better appropriate conservation investment both locally and regionally.

Dr. Karen V. Root is an Associate Professor and Graduate Coordinator in the Department of Biological Sciences at Bowling Green State University. Her research focuses on the conservation of biodiversity, including conservation planning and management, through the combination of field study and the application of quantitative techniques such as GIS and risk assessment. She works with a variety of organisms and scales from single species population dynamics to landscape-scale multispecies reserve designs.

"Butterfly Surveys as a Tool to Measure Conservation Success and Population Shifts Due to Climate Change"

Michele Banker and Elisabeth Rothschild / Marianist Environmental Education Center, Dayton, OH

Abstract: Butterfly population surveys provide a tool for measurement of conservation and habitat restoration quality. Many butterfly species have highly specific host plant requirements beside their need for sufficient nectar /food sources. Butterfly surveys can reveal increases in diversity of native plant communities and habitats achieved through restoration, thereby giving an indication of conservation success. We have established two butterfly monitoring transects as outlined by the Ohio Lepidopterists Long-Term Monitoring protocol. The Mount Saint John Front Field (MSJ-FF) transect is 80% open meadow/prairie habitat. The Mount Saint John Woodland and Prairie (MSJ-WP) transect is 80% woods and edge habitat. During a 4 year span, we have recorded 57 species belonging to the Hesperiidae, Papilionidae, Pieridae, Lycaenidae, and Nymphalidea families. Both transects are dominated by the cabbage white. In addition, MSJ-FF counts are dominated by species of sulphurs and skippers preferring open habitat while the MSJ-WP is dominated by woodland/edge species of emperors, anglewings and little wood satyrs. Several non-resident southern sulphur species make regular yearly appearances. In August, 2012 we documented the first occurrence of the rare stray southern species, dainty sulphur, *Nathalis iole*, in Greene Co, OH. Southern emigrant skippers make regular appearances. As butterfly populations respond to climate change, we will work to provide a diverse native plant community and habitat for both northern extension and withdrawal.

Author Bios: Michele G. Banker earned a Masters in Biology from the University of Dayton and serves as the Land Resource Coordinator for the Marianist Environmental Education Center (MEEC). As steward of the 100 acres of natural areas at Mount Saint John, she has led the establishment and management of tall grass prairie, non-native invasive plant monitoring and installation of a bioretention pond for storm water runoff control. Over the last 15 years she has led service learning,

educational programs, ecological research, and worked with volunteers on land restoration projects in woodland, prairie, wetlands and native plant nurseries.

Elisabeth Rothschild graduated from Antioch College with a double major in chemistry and biology and Wright State University with a Masters in Biology. She worked as an Environmental Specialist with Ohio EPA for ten years. She is currently a NAI Certified Interpretive Host and Interpretive Guide. She volunteers with Five Rivers Metroparks, Centerville Washington Twp. Park District, and the Marianist Environmental Education Center (MEEC), where she conducts butterfly surveys and lectures on pollinators, including gardening for wildlife.

"Survey of Freshwater Mussels in Eagle Creek, Portage and Trumbull Counties, OH"

Matt Begley and Robert Krebs / Cleveland State University, Department of Biological, Geological, and Environmental Science

Abstract: Between May and August, 2013, surveys were conducted for freshwater mussels (Unionidae) in Eagle Creek, which is located in Portage and Trumbull Counties. Eagle Creek is located in an agricultural watershed and is part of the Upper Mahoning River watershed. The stream was surveyed at eight sites between Garrettsville, OH, and the confluence with the Mahoning River. Visual surveys were used in most areas, as was permitted by the shallow water. Tactile searches and mussel rakes were also used to survey deeper areas and to find smaller mussels. Mussels were removed from the sediment and collected for identification of species, measurement of maximum length, and estimation of age by counting growth lines when possible. Shells of dead mussels were collected and are held at Cleveland State University. Many live mussels were found in Eagle Creek (n=675), consisting of eight species. All sites were dominated by the fatmucket (*Lampsilis siliquoidea*), which comprised 73% of live mussels. One-way ANOVA showed significant differences in length and estimated age between some of the sites. The largest and oldest mussels were found at the furthest upstream site, which is located approximately 0.5 miles downstream of a dam in Garrettsville. However, there were no consistent patterns in size and age distribution, diversity, or abundance along the direction of the stream. Future studies will investigate the local hydrologic variables that may influence diversity, abundance, size, and age of freshwater mussels throughout the entire Upper Mahoning River watershed.

Author Bios: Matt Begley is pursuing a Master's Degree in Biology at Cleveland State University. His research interests include distribution of mussels in Ohio and the influences that hydrology, geology, and land use have on their distribution and abundance.

Dr. Robert Krebs is a professor in the Department of Biological, Geological, and Environmental Sciences at Cleveland State University. His main research interests are the distribution and population genetics of freshwater mussels in Ohio.

"Shelter Competition Between Invasive Crayfish (*Orconectes rusticus*), Native Crayfish (*O. obscurus*), and a Native Benthic Stream Fish (central mottled sculpin)"

Kailey N. Cooper and Jennifer M. Clark / Hiram College, Department of Biology

Abstract: Invasive crayfish are a major concern in aquatic ecosystems and can have devastating impacts on both plant and animal communities. The rusty crayfish (*Orconectes rusticus*), is a common invasive in the Great Lakes region and has had detrimental impacts in both lake and stream ecosystems through destruction of macrophyte beds, outcompeting native crayfish for shelters which often increases susceptibility to fish predation), and hybridizing with native crayfish producing competitively superior individuals. Although many species are outcompeted by the rusty crayfish some species seem to be able to coexist. In this study, we used an artificial stream to investigate the competitive superiority between the invasive rusty crayfish, native crayfish (*O. obscurus*) and central mottled sculpin (*Cottus bairdi*) fishes for shelter. The following combinations were tested: 10 *O. obscurus* + 10 *C. bairdi*, 10 *O. rusticus* + 10 *C. bairdi*, and 10 *O. obscurus* + 10 *O. rusticus*. Only 10 pvc shelters were used to limit shelter availability. During each 24-hour trial, shelters were monitored for species occupancy at dawn, afternoon, and dusk. Our results show that invasive rusty crayfish occupied significantly more shelters than the native crayfish ($P = 0.0042$). However, combinations of both invasive and native crayfish with the central mottled sculpin showed that neither crayfish displayed competitive superiority over this benthic fish ($P > 0.05$). Overall, this suggests that the rusty crayfish may be able to outcompete native *O. obscurus* for shelter.

Author Bios: Kailey Cooper is a junior at Hiram College majoring in Biology. She is interested in ecology and hopes to continue aquatic ecology after graduation.

Dr. Jennifer Clark is an assistant professor of biology at Hiram College. She received her PhD in Ecology from Kent State University in 2009 and focused her research on factors structuring stream crayfish distribution patterns. Her current research focuses on how natural abiotic and biotic parameters structure stream communities and how land use impacts community structure and ecosystem function.

"Seasonal Distribution of Female Eastern Box Turtles in the Oak Openings Region"

Matthew D. Cross[1], Gregory Lipps, Jr.[2], and Karen V. Root[1] / [1]Bowling Green State University, Department of Biological Sciences; [2]Gregory Lipps, LLS, Delta, OH

Abstract: Eastern box turtles (*Terrapene c. carolina*) are a species on the decline throughout their remaining range and are one of nine model species for the Green Ribbon Initiative in the Oak Openings Region of northwest Ohio. As is true with many holistic conservation plans, the first step is to identify critical areas and habitat for the focal species in a given region. To this end, we used box turtle presence data from an ongoing telemetry study and reported sightings to build month-to-month and yearly habitat suitability models depicting occurrence probability within the Oak Openings Region. Our models indicated that habitat type, soil type and canopy density were the most important predictor variables and, to a lesser extent, elevation and distance to edge habitat. Month-to-month models showed seasonal shifts in predicted distribution with May having the largest difference in predictive overlap. Analysis of the distribution of occurrence probability quantiles (0-100) revealed there to be a disproportionately large amount of highly-ranked habitat within protected areas,

particularly the Oak Openings Preserve. Our results highlight temporal shifts in habitat usage and distribution for box turtles in this region and can be used to guide conservation efforts.

Author Bios: Matthew D. Cross is a doctoral candidate in the Department of Biological Sciences at Bowling Green State University. Following M.S. degrees in conservation biology and geographic information sciences working with massasauga rattlesnakes, he took up research on box turtles in the Oak Openings Region or northwestern Ohio. He uses a variety of modeling techniques to examine the spatial ecology of his study organisms at multiple scales in an attempt to make predictions that can guide conservation efforts.

Gregory Lipps is a herpetologist and conservation biologist who works throughout Ohio. Originally from Cincinnati, he began his career in the Department of Herpetology at The Toledo Zoo in 1995. After leaving the zoo, he completed his Masters in Biology in 2005 at Bowling Green State University. Since that time, Greg has been conducting surveys of amphibians and reptiles throughout the state and collaborating on conservation strategies for a wide range of species and ecosystems. Recent work has focused on the conservation of the Eastern Hellbender, Eastern Massasauga, Blanding's Turtle, and Spotted Turtle, as well as conservation planning and restoration in the Oak Openings Region, Grand River lowlands, and the Captina Watershed. Greg served as co-chair of the Midwest Regional Working Group of Partners in Amphibian and Reptile Conservation (PARC) from 2006 to 2009.

See previous poster abstract for bio. of Dr. Karen V. Root.

"Histological Analysis of Reproduction Biology of a Estuarine Jellyfish (*Chrysaora quinquecirrha*)"

Jessica Gezymalla, Talia Young, Jim Vasslides, and Mahealani Kaneshiro-Pineiro / Hiram College, Department of Biology, Rutgers Marine Field Station, and Barnegat Bay Partnership

Abstract: The sea nettle, Chrysaora quinquecirrha, is a stinging scyphozoan jellyfish found in abundances that can be problematic for locals and tourists in the Mid-Atlantic. Histological techniques were used to assess three questions relevant to sea nettle management in New Jersey: 1) Are historically used visual methods of sex identification accurate, 2) What is the sex ratio of sea nettles in Barnegat Bay, and 3) What percentage have reached maturity? Sea nettle gonads were extracted, embedded on slides, and analyzed for presence of egg or sperm, egg size, and presence of ruptured sperm follicles in order to determine sex and maturity. Visual methods were more accurate when identifying males than females. There were more females than males and most males were immature. Learning more about the sex ratio and sexual maturity of sea nettles may cast light on their reproductive strategies - sexual reproduction in the medusa stage or asexual reproduction in the polyp stage - which may be relevant to managing populations.

Author Bios: Jessica Gezymalla will be graduating in May with a B.A. from Hiram College. I have been involved in various projects at Hiram addressing the effectiveness of stream restoration projects. I have also worked on a jellyfish histology project in the hopes of better understanding the biology of a nuisance species while an intern at Rutgers University.

Talia Young received her B.A. from Swarthmore College and is currently pursuing a Ph.D. at Rutgers University. She currently studies marine and aquatic food webs in the hopes that understanding the relationships between species can help us better manage them as resources.

Jim Vasslides received his B.S. and M.S. from Rutgers, The State University of New Jersey, and has published papers on fish community assemblages, feeding interactions, and early life history movements. His research interests include the role of estuaries as nurseries, the restoration of shallow water habitats, and climate change effects on species distributions and assemblages.

Mahealani Kaneshiro-Pineiro received her B.A. and M.S. from the University of Hawai`i and her Ph.D. from East Carolina University. Her research interests focus on Scyphozoan jellyfish, particularly jellyfish-human interactions.

"Interactions Between Green Frog Tadpoles and Freshwater Snails"

Laura Hill and Michael F. Benard / Case Western Reserve University

Abstract: Interspecific competition can be an important limiting factor in growth and development. Previous studies have found evidence of both competition and facilitation between tadpoles and snails. To test the hypothesis that green frog (*Rana clamitans*) tadpoles compete with freshwater snails (*Planorbella trivolvis*) for food and space, we manipulated the presence of both species to determine effects of interspecific interactions on growth, development, and behavior. Treatments included snails alone, tadpoles alone, snails and tadpoles together, and neither tadpoles nor snails. Behavioral assays allowed us to determine how often both species occupied tank walls, and if snail presence altered tadpole activity. After the experiment we compared tadpole mass and developmental (Gosner) stage across treatments. Zooplankton and chlorophyll *a* densities were measured to determine the effects of each treatment on abundance and primary productivity. Predictions for the interspecific treatment included lower survival and development in both species, lower zooplankton abundance and primary productivity due to higher abundance of consumers, and more snails and tadpoles on sides of mesocosms due to hiding space competition. We also predicted that larger, more highly developed animals in interspecific treatments could provide evidence for facilitation. Studying effects of interspecific competition may reveal new information about competing species and their ecosystems. If our predictions are valid, snails and tadpoles could experience lower survival and development in diverse ponds and be forced into shallower water, leaving them more vulnerable to land-dwelling predators. Lower primary productivity and zooplankton abundance could have a negative impact on other species that utilize these resources.

Author Bio: Laura Hill is a junior at Case Western Reserve University. She plans to graduate in May 2015 with a B.A. in Biology. Her current research project examines the interactions between green frog tadpoles and freshwater snails coexisting in mesocosm habitats.

See previous speaker abstract for bio. of Dr. Michael F. Benard.

"First Observation of the Eastern Sand Darter (*Ammocrypta pellucida*) in Raccoon Creek (Ohio River Basin) in southeastern Ohio in 57 Years"

Rob Hopkins / University of Rio Grande

Abstract: The Eastern Sand Darter (*Ammocrypta pellucida*) has a broad and sporadic distribution in eastern North America. Once common, the species has experienced a sharp decline in its range during the last 50 years primarily because of habitat destruction. Populations now persist only in isolated localities which contain clean, sandy substrates. In this paper, we document the presence of the Eastern Sand Darter in Racoon Creek in southeastern Ohio, where it had not been reported in over 57 years, and briefly review its historical and contemporary distribution throughout the state. This new distributional observation suggests stabilization and perhaps gradual recovery of an ecologically sensitive species recently considered for federal listing.

Author Bios: Rob Hopkins is an Assistant Professor of Biology at the University of Rio Grande in Rio Grande, Ohio. He teaches in the Wildlife and Fish Conservation and Management program and conducts research in landscape ecology and ichthyology.

"Exotic Ants (Hymenoptera: Formicidae) of Ohio"

Kal Ivanov / Cleveland State University, Department of Biological, Geological, and Environmental Sciences and John Carroll University, Department of Biology

Abstract: The worldwide transfer of plants and animals outside their native ranges is an ever increasing problem for global biodiversity. Ants are no exception and many species have been transported to new locations with often profound negative impacts on local biota. The current study is based on new, mostly qualitative, records and observations gathered since the publication of the 'Ants of Ohio' in 2005. Here I extend the present knowledge of the Ohio's ant fauna with the inclusion of newly discovered exotic species, and the incorporation of new distributional and ecological data. As a result of the current study the number of known ant species in the state is increased to 133. Ohio's exotic ant fauna includes notorious ant invaders, major nuisance pests and species whose status is currently poorly understood. This list contains 10 species (~8% of Ohio's myrmecofauna) with origins in a variety of geographic regions, including Central and South America, Europe, Australia, and Asia. Two rather distinct groups of exotics, somewhat dissimilar in their geographic origin, occur in Ohio: a) 3 species of Eurasian origin that have established reproducing populations outdoors; and b) 7 species of subtropical/tropical origin currently confined to man-made structures. Only a single species (*Nylanderia flavipes*) is seen, at present, to be of concern although its effects on local ant communities seem largely restricted to already, anthropogenically, disturbed habitats. A continual, careful, sampling of disturbed areas, urban sites, plant nurseries and conservatories would be worthwhile to extend, and build upon our current knowledge of Ohio's exotic ant fauna where new arrivals are undoubtedly to be expected.

Author Bio: Kal Ivanov is currently a biology and ecology instructor at Cleveland State University and John Carroll University. I received my Ph.D. in Ecology from Cleveland State University, and my Master's Degree in Entomology from Sofia University (Bulgaria). Upon completion of my Master's

degree, and prior to my arrival in Ohio, I spent two and a half years at the Institute of Zoology at the Bulgarian Academy of Sciences, where my primary research focus was on the distribution and taxonomy of the parasitoid wasps in the families Ichneumonidae, Evaniidae, Gasteruptiidae and Aulacidae in Bulgaria. My current research interests are in the area of ant taxonomy and natural history, isopod natural history, biodiversity, urban ecology, and invasion biology. The focus of my Ph.D. work was on the effects of forest fragmentation, species invasions and urbanization on the leaf-litter ant communities in the temperate forests of northeastern Ohio. My most current research is related to exploring the ant and isopod diversity in Ohio, and northeastern US.

"The Role of Patch Size, Isolation, and Forest Condition on Pileated Woodpecker Occupancy in Southwestern Ohio"

Anna L. Kamnyev and Volker Bahn / Wright State University, Department of Biological Sciences and Brukner Nature Center

Abstract: No studies of Pileated Woodpeckers (*Dryocopus pileatus*) have been done in southwestern Ohio where agriculture is prevalent and forests are significantly fragmented. Pileated Woodpeckers have been shown to require large forest fragments (>100 ha) that encompass large older or dead trees for foraging and excavating. Nevertheless, the species persists and are commonly seen in smaller woodlots and even residential neighborhoods containing highly developed areas with a scarce abundance of trees. The objective of this study was to determine the forest fragment size, isolation, and structure preferred by *D. pileatus* for breeding habitat. We sampled 37 forest fragments varying in size and isolation for *D. pileatus* cavities and forest characteristics and used LiDAR remote sensing data to analyze forest complexity. We hypothesized that *D. pileatus* relative abundance would increase with forest fragment size, density of dead trees, and forest vertical complexity but decrease with isolation. The hypotheses that size and isolation of a forest fragment influence *D. pileatus* habitat choices were rejected. However, snag density, directly relating to food and shelter requirements for *D. pileatus*, showed the predicted association with woodpecker activity as did forest height and forest complexity.

Author Bios: Anna Kamnyev is a current Wildlife Educator for Brukner Nature Center in Troy, Ohio. She recently completed her Master's of Science in Biology at Wright State University under Dr. Volker Bahn. Her master's work entailed researching the habitat preferences of Pileated Woodpeckers in relation to site size, isolation, and forest composition. Inspired by her enthusiasm for wildlife conservation her research aimed to explain the forest size and structure suitable for maintaining the presence of these large woodpeckers that have often been referred to as a keystone species. As a Wildlife Educator with Brukner Nature Center, she aspires to fulfill the institution's mission of promoting an appreciation and understanding of wildlife through wildlife preservation, education, and rehabilitation.

Dr. Volker Bahn's main interests are Macroecology and Conservation Biology. In particular he's interested in the spatial patterns in the distribution of abundance of a species across its range. Beyond the influence of the physical environment, he believes that dispersal, population dynamics, and habitat configuration have been underappreciated as major processes influencing distribution patterns.

Resulting spatial patterns in species' distributions of abundances, such as spatial autocorrelation, have been underutilized for improving model predictions. His current research aims at a) elucidating these processes and the resulting spatial patterns, and b) creating improved distribution models based on the gained spatial ecological insights.

"Practically Non-toxic to Aquatic Organisms? The effects of Rodeo™ Herbicide Exposure on Northern Cricket Frogs (*Acriss crepitans*)"

Katherine L. Krynak and Michael F. Benard / Case Western Reserve University, Department of Biology

Abstract: Glyphosate based herbicides are commonly used to manage invasive plants in terrestrial and aquatic habitats. Acute toxicity studies have categorized Rodeo™ as *practically non-toxic to aquatic organisms*. Rodeo™ herbicide is routinely used to control Narrow-leaved Cattail and Common Reed in ponds where Cricket frogs reside. Effects of Rodeo™ on amphibians have gone largely untested. Our research tested for effects of Rodeo™ on Cricket frog survival, growth and development and compared environmentally relevant concentrations of the active ingredient (a.i.), glyphosate (0.0mg/L, 0.75mg/L, 1.5mg /L, 2.5mg/L), across differing application time points (larval period exposure, post-metamorphosis exposure, and combined larval stage and post-metamorphosis exposure). Rodeo™ exposures were conducted via static renewal for 16 days. We found that Rodeo™ did not alter time to metamorphosis, nor juvenile mass; however 2.5 mg a.i./L significantly decreased tadpole survival to metamorphosis while lower doses of Rodeo™ did not affect tadpole survival. Moreover, our results indicated that if Cricket frog tadpoles survive to metamorphosis, Rodeo™ exposure (0.75 and 1.5mg a.i./L) to juveniles did not significantly alter survival. Additionally, we will be testing effects of Rodeo™ on Cricket frog immune defense traits known to contribute to pathogen resistance. Pathogens are a leading cause of amphibian declines globally; therefore understanding how anthropogenic environmental changes may alter disease resistance traits is crucial for amphibian conservation.

Author Bios.: Katherine L. Krynak is a PhD Candidate and National Science Foundation Graduate Research Fellow in the Biology Department at Case Western Reserve University. Katherine's dissertation research focuses on relationships between anthropogenic environmental change and amphibian immune defense traits. Katherine conducts her laboratory analyses of amphibian immune defenses at The Holden Arboretum's Science Center in collaboration with microbial ecologist, Dr. David Burke.

See previous speaker abstract for bio. of Dr. Michael F. Benard.

"First-year Water Quality and Macroinvertebrate Changes After Low-head Dam Removal on Baldwin Creek (Cuyahoga Co., OH)"

Jenn R. Lenart and R. Chris Stanton / Baldin Wallace University

Abstract: Baldwin Creek is a tributary of the Rocky River in northeast Ohio that drains a 9.8 square-mile area. In November 2012, three low-head dams were removed from the lower stretch of the creek because they were no longer needed or functional. These dams also acted as barriers between native invertebrate and fish populations, including the state-threatened Big Mouth Shiner (*Notropis dorsalis*). The objectives of this project were to document summer water quality parameters and evaluate the macroinvertebrate community before and after dam removal. Water quality data were collected from May to August of 2011 – 2013 and macroinvertebrates were evaluated in July of 2012 and 2013. In less than one year post-removal, water quality showed signs of improvement in temperature and dissolved oxygen levels. There was also an increase in the richness and evenness of the macroinvertebrate community, indicating progress in biological conditions. Overall, the elimination of these dams has been an immediate success in removing physical barriers, improving water chemistry, and restoring a more balanced ecological community. Baldwin Creek will continue to be monitored during the summer for longer-term changes and impacts of dam removal.

Author Bios: Jenn R. Lenart is from Naperville, Illinois and is majoring in Economics and minoring in Biology and Public Relations at Baldwin Wallace University. She plans to work after her undergraduate degree has been earned and hopes to continue researching environmental topics after she graduates. Jenn has been highly involved with both the Economics Department and Biology Department at BWU and has a goal to integrate the two fields in her future career.

R. Chris Stanton is from Cincinnati, Ohio and has earned degrees from Wittenberg University (B.A.), the University of Tennessee (M.S.), and The Ohio State University (Ph.D.). He is currently a professor of biology at Baldwin Wallace University where he teaches courses in general biology, zoology, invertebrate natural history, and tropical ecology in Costa Rica. He also conducts field research with undergraduate students on a wide range of topics, including biodiversity, water quality assessment, and declining pollinators in the Great Lakes region.

"*Semionellus placidus* natural history and distribution in the Mid-Ohio Valley"

Katy Lustofin / Marietta College, Department of Biology and Environmental Science

Abstract: *Semionellus placidus* (Polydesmida: Xystodesmidae) has a sporadic distribution, occurring in 4 distinct populations in Michigan, Indiana, Minnesota/Wisconsin, and west central Virginia. It has additionally been reported from a single specimen in Monroe County, Ohio. Two years ago, Derek Hennen discovered a population at the Barbara M. Beiser Field Station in Washington County, Ohio, approximately 25 miles downriver from where the Monroe County specimen was found. Little has previously been published on the natural history and habits of this millipede, which is known to fluoresce under UV light. Using a UV flashlight, I surveyed 7 sites within Washington County and one site in neighboring Wood County, WV for the presence of *S. placidus* throughout the summer and fall of 2013. Two of the sites surveyed, Haught Run and Hune Bridge, are located along the Little Muskingum River, between the Beiser Field Station and the Monroe County site. *S. placidus* was in only one new site, Haught Run. Distribution of the millipede within its range appears to be clumped,

with relatively high densities where it is found. The millipede is active for several weeks in October, burrowing shallowly into the soil during the day and emerging into the leaf litter around sunset.

Author bio: Katy Lustofin is an assistant professor of biology at Marietta College. Her current research interests include bees and millipedes.

"Effect of Wildlife-friendly Gardening on Species Interactions"

Jennifer S. Malpass[1] and Amanda D. Rodewald[2] / [1]The Ohio State University, School of Environment and and Natural Resources; [2]Cornell University

Abstract: Urban development often affects resource availability in ways that can influence not only community structure, but key species interactions that shape population dynamics. Although some resources changes are unintentional, other changes deliberately aim to improve habitat for urban wildlife, particularly songbirds. Wildlife-friendly gardening practices seek to increase the suitability of yards for wildlife, for both the benefit of wildlife and the people who wish to view them. These programs often encourage increasing vegetation structure and providing food, but little research has addressed the ecological effects of these recommendations, particularly on species interactions. We investigated if increasing woody cover and food availability might inadvertently attract nest predators. We surveyed nest predator activity and characterized habitat using aerial imagery of seven suburban neighborhoods in Franklin County, Ohio from April through August 2011-2013. In 2013 we added experimental bird feeders to some neighborhoods in which bird food was previously limited. Predator activity varied widely among individual yards, but contrary to our expectations, the amount of trees and shrubs was not a strong predictor of predator activity. However, adding bird food to neighborhoods was associated with increased detections of an important nest predator and brood parasite, Brown-headed cowbird (*Molothrus ater*). Thus, our research suggests that while some vegetation recommendations for wildlife-friendly gardening do not necessarily attract predators of songbird nests, encouraging people to provide bird feeders could result in unintended consequences for breeding songbirds. Because nest predation remains the leading cause of avian reproductive failure, additional research that clarifies how resource availability influences species interactions will facilitate the creation of management recommendations that increase the conservation value of urban environments for songbirds.

Author Bios: Jennifer Malpass is a PhD candidate in the Terrestrial Wildlife Ecology Lab at OSU.

Dr. Amanda Rodewald is the Director of Conservation Science at the Cornell Lab of Ornithology, and an Associate Professor at Cornell University.

"A Preliminary ATBI (All-Taxa Biotic Inventory) for the Barbara A. Beiser Field Station, Washington County, Ohio"

Dave McShaffrey[1], Derek Hennen[2,1], MaLisa Spring[1], Katy Lustofin[1], and Destiny Remeneric[3] / [1]Marietta College, Department of Biology and Environmental Science and Institute of Arthropod

Research; [2]University of Arkansas, Department of Entomology; [3]Marietta College, Department of Biology and Environmental Science

Abstract: The Barbara A. Beiser Field Station occupies approximately 31 hectares at 39.419270N and 81.361025W along 780m of the Little Muskingum River in Washington County, Ohio. The land rises steeply from 180m AMSL at the river to 275m AMSL on the adjoining ridge about 500m distant. Since 2008, the property has been managed as a field station by Marietta College under an agreement with the Friends of Lower Muskingum River, a land trust. From 2008 to 2013 the property was sampled by classes from the college and by individuals working on taxa-specific projects (Hemiptera, Diplopoda, Apidae, Reptilia, Amphibia); other opportunistic sampling also occurred. Collected specimens were the largest single source of data for the ATBI and were collected via a wide range of techniques mostly aimed towards arthropods. The next largest number of records were based on photographs taken at the station. Additional records were collected from lists and other observations made while at the station and contain over 435 species. Over 70% of the species are arthropods; chordates and plants make up approximately equal numbers of the remaining species. Southeastern Ohio's biota has been poorly documented; it is likely that some of these species are county or even state records, but the present fragmentation of biological records between scattered printed journals and incomplete online databases makes this difficult to determine without careful species-by-species evaluations. The ATBI is ongoing with focused attention on trees and shrubs planned for 2014.

Author Bios: Dr. Dave McShaffrey is professor of biology and environmental science at Marietta College and director of the Barbara A. Beiser field station. His research interests include use of benthic macroinvertebrates as indices of water quality, distribution and ecology of Chironomidae, functional morphology of aquatic invertebrates, biogeography of Odonata, and other stuff.

Derek Hennen is a graduate of Marietta College currently pursuing an MS degree in Entomology at the University of Arkansas. Interested in all taxa, he has a particular passion for millipedes and Reduviidae. His research at the Beiser field station contributed the majority of the specimens and represented about 1/3 of the species reported here.

MaLisa Spring is a biology major at Marietta College. Her 2013 research on native pollinators in Washington County included 3 transects at the Beiser field station. She will be going to graduate school in the fall of 2014 for a Master of Science in Entomology.

Dr. Katy Lustofin is an assistant professor of biology at Marietta College whose research interests include bees and millipedes.

Destiny Remeneric is a biology major at Marietta College whose 2013-2014 research focused on the reptiles and amphibians at the station.

"Baseline Data Collection of Abiotic Parameters and Invertebrate and Fish Communities Prior to Restoration Efforts of Eagle Creek"

Zachary C. Nemec, Sara E. Piccolomini, and Jennifer M. Clark / Hiram College, Department of Biology

Abstract: Biodiversity and habitat structure/properties of stream ecosystems are dramatically influenced by surrounding land use. Anthropogenic impacts such as logging, agriculture, urbanization, damming, and mining have all shown to cause decreased stream health and negative impacts on invertebrate and fish communities. Prior to being obtained by the college, the Hiram College Eagle Creek restoration site was heavily logged. In addition to other upstream and downstream (a large dam) impacts, these land use changes have caused heavily eroded banks, high turbidity, increased sandy sediments, and poor canopy cover to occur within this site. Surveys of biotic communities and abiotic parameters were taken prior to diverting the channel to collect baseline data that will be used to compare stream quality and health in years to come now that the diversion has been completed as of August 2013. An Invertebrate Community Index and Fish Biotic Index will be calculated upon completion of sample sorting and identification to catalog overall stream health of the Eagle Creek prior to the restoration project.

Author Bios: Zach Nemec is a sophomore Biology major at Hiram College. Currently he is working on a project at Hiram College's Eagle Creek restoration site surveying fish and macroinvertebrates.

Sara Piccolomini is a senior Environmental Studies major at Hiram College. Her broad research interests are in wetland ecology and more specifically amphibian ecology and disease and invertebrate diversity. She plans to attend a graduate program upon graduation.

See previous abstract for bio. of Dr. Jennifer Clark.

"Effects of an EF-2 Tornado on Ground Beetle (Family: Carabidae) and Spider (Order: Araneae) Communities in a North-Central Ohio Forest"

Sarah J. Rose and Charles P. Goebel / The Ohio State University, School of Environment and Natural Resources

Abstract: In the Central Hardwood Forest region, catastrophic winds associated with thunderstorms and tornadoes are important natural disturbances that affect ecosystem structure and function. Few studies, however, have evaluated the natural succession of a forest impacted by catastrophic winds. In 2010, an EF-2 tornado with winds ranging from 179-217 kph impacted the forests of the Secrest Arboretum at the OARDC campus of The Ohio State University, providing an opportunity to quantify the recovery of a relatively undisturbed natural forest ecosystem. Following the tornado, we established a grid of geo-referenced points in the tornado-impacted stand and an adjacent unimpacted reference stand for comparisons of forest composition and structure. In 2013, using these same geo-referenced locations, pitfall traps were installed at each sampling location in order to quantify the ground beetle (Family: Carabidae) and spider (Order: Araneae) communities. In addition, spiders were

sampled visually, with a beating tarp, and using leaf litter extraction. Ground beetles and spiders were preserved in 70% ethanol and will be identified to species allowing for comparisons of community composition and abundance. Overall, we found lower densities of beetles in the tornado impacted compared to the unimpacted stand, and similar densities of spiders in both sites. As we continue to study these communities, we will develop a better understanding of role that natural disturbances, and the legacies of these disturbances, play in regulating the structure and composition of ground beetle and spider communities. Such information is important as we develop restoration strategies that emulate natural models of ecosystem development.

Author Bios: Sarah J Rose is a PhD student with the School of Environment and Natural Resources with The Ohio State University. She received her Bachelor's from Ohio State in 2008, and has worked on several ecological research projects, but is currently focused on understanding the dynamics of spider communities after disturbance.
Dr. P. Charles Goebel is a Professor and Assistant Director of the School of Environment and Natural Resources, The Ohio State University, Wooster, OH. His research interests include forest restoration ecology, riparian ecology and management, forest community and ecosystem ecology, and watershed management and restoration.

"Prey Size Selection in the Great Blue Heron (*Ardae herodias*) at a Restored Wetland in Northwest Ohio"

Tracy A. Swanson and Christopher M. White / University of Findlay

Abstract: Great Blue heron (*Ardae herodias*) foraging has been observed in Spurgat Wetland, a newly constructed (2007) wetland in northwest Ohio. The objective of this project is to study heron feeding ecology, specifically selection of anurans as prey items. The recovery of two transponders from the remains of defecated (or regurgitated) frogs tagged at Spurgat Wetland support observations of heron foraging at the wetland. The transponders were recovered from a heron rookery on private property 5.87 km from the wetland in August 2010 and May 2013. These transponders were injected into adult frogs of two species, the American Bullfrog (*Lithobates catesbeianus)* and the Green frog (*Lithobates clamitans*). Both specimens are larger than the median for the species in this wetland. This study represents one aspect of a larger on-going project evaluating the growth and success of populations within the wetland and the wetland's overall health.

Author Bios: Tracy Swanson is an undergraduate student researcher at the University of Findlay. She is double-majoring in biology and animal science and minoring in chemistry. While at the University of Findlay, she has been involving in four research projects that have focused on anuran and avian life. After graduating, she hopes to attend veterinary school and specialize in zoo and exotic animal medicine.

Christopher M. White is an Instructor of Biology, the Laboratory Manager of the Davis St. Laboratories and the Supervising Researcher of the Spurgat Wetland Research Project at The University of Findlay. His specialty is in phylogenetics of marine invertebrates but he has developed an interest in anuran populations since joining the Spurgat Wetland Research Project in 2008.

"Seasonal Changes in the Macroinvertebrate Community and Water Chemistry in Four Headwater Streams in Southeast Ohio During Summer and Fall"

Chelsea Wallace and Kelly Johnson / Ohio University

Abstract: In intermittent streams, macroinvertebrate communities and water chemistry can be strongly structured by rainfall-related flow, channel wettedness, and seasonal patterns of development of individual taxa. We used a modified bucket method to monitor taxonomic richness and abundance of macroinvertebrates in four headwater streams in southeast Ohio at 2-3 week intervals from late May to August, 2013. Stream wettedness and water pH, conductivity and temperature were also monitored. The highest recorded family level taxa richness out of our four stream reaches was 10 compared to the lowest of 3. Mayflies (Leptophlebiidae), isopods (Asellidae), and midges (Chironomidae) were the most numerically dominant taxa. The Leptophlebiidae exhibited a pattern of decline through the summer to fall. The Chironomidae and Asellidae exhibited mixed patterns of abundance through summer to fall. From early October to November, additional measures of water chemistry were recorded before and after rainstorms to investigate the effect of rain events on water chemistry in two stream reaches. The range of pH varied in from 7.55 to 8.50 and 7.23 to 8.29. Conductivity varied from 511 to 721 and 639 to 1137. Generally conductivity decreased with precipitation while pH increased.

Author Bios: Chelsea Wallace is a senior attending Ohio University in pursuit of a bachelor's degree in Wildlife and Conservation and a minor in Plant Biology

Kelly Johnson earned a doctorate in Entomology at Michigan State University in 1993. She is currently an Associate Professor of Biological Sciences and holds the AEP Watershed Restoration Professorship at Ohio University. Her research focuses on stream restoration, biological monitoring, and predicting biological recovery in acid mine impaired streams.