Ohio Natural History Conference

Poster Schedule

1. "An Updated List of Ants (Hymenoptera: Formicidae) of Ohio" – **Kal Ivanov:** Virginia Museum of Natural History, Department of Recent Invertebrates

2. "Short-term responses of fish community structure following re-meandering restoration of Eagle Creek (Garrettsville, OH)" - **Jennifer M. Clark** and Justin J. Montemarano: Hiram College, James H. Barrow Field Station, and Armstrong State University

3. "Impacts of re-meandering restoration efforts on predation risk of juvenile crayfish (*Orconectes obscures*)" - **Erica Dulka** and Jennifer M. Clark**:** Hiram College and James H. Barrow Field Station

4. "Movement and population trends in the meadow jumping mouse (Zapus hudsonius) and woodland jumping mouse (Napaeozapus insignis) at Sunnybrook Preserve in Geauga County, Ohio using a mark-recapture approach: a summary of preliminary data." - **Dolly L. Crawford, Ph.D.:** Ashland University, Department of Biology and Toxicology

5. "Assessing Incubation Status of Songbird Eggs Using FLIR Technology" - **Dustin M. Edens,** Donald P. Althoff, and Lucille M. Williams: University of Rio Grande, Rio Grande, Ohio. Email: dalthoff@rio.edu

6. "A floristic inventory of three prairie-like openings in Strouds Run State Park, Athens County, Ohio" - **Marion Andrews Holmes** and Philip D. Cantino: Ohio University

7. "Assessing Spot Symmetry of Spotted Salamanders: the Impact of Training on Accuracy of Spot Counts" - **Andrea L. Maxwell,** Donald P. Althoff, John A. Blazer, Robert S. Miller, Christian J. Morgan, Colin F. Stanley, John R. Schwartz, and Wyatt E. Snodgrass: University of Rio Grande, Rio Grande, Ohio. Email: dalthoff@.rio.edu

8. "Survey and identification of native and invasive earthworms under cover objects in the Cincinnati region" - **Maria J. Murillo,** Denise T. Baldrick, Brittany Hubbard, Keen A. Wilson, and Patrick C. Owen: Biology Department, University of Cincinnati, Blue Ash College

9. "Summer Foraging Resource Selection of Local Bats" - **Molly Simonis** and Volker Bahn: Wright State University Department of Biological Sciences, Dayton, OH

10. "Use of Lindgren Funnel Traps to Assess Arthropod Diversity in a Hardwood Forest: Clear vs. Yellow Jar Solution Results" - **Wyatt E. Snodgrass,** Donald P. Althoff, Paul L. Verga, Erik T. Brandt, Frank P. DePalma, Dustin M. Edens, Colin F. Stanley, Natasha M. Richmond, Lucille M. Williams, and Adrian A. Shields: University of Rio Grande, Rio Grande, Ohio. Email: dalthoff@.rio.edu

11. "Dragons across Ohio: Citizen Scientists document biodiversity" - **MaLisa Spring,** Jim Lemon, and Norman Johnson: The Ohio State University

12. "Evaluating potential effects of proximity to roadways in a road-naïve population of turtles" - **N.M. Weigand**[1], C.M. Tonra[2], R.B. Wagner[1], V.D. Popescu[1]: [1] Ohio University, Athens, Ohio, [2] The Ohio State University, Columbus, Ohio

13. "Comprehending Virginia and Sora Rails and the Dynamic Wetland Plant Communities They Live In" - **Olivia Widenmeyer:** Ashland University

14. "GIS-based Analysis of Land Cover Types Associated with Kestrel Occupancy of Nest Boxes in Southeast Ohio" - **Lucille M. Williams,** Donald P. Althoff, and Robert L. Hopkins II: University of Rio Grande, Rio Grande, Ohio. Email: dalthoff@.rio.edu

15. "Amphibian Roadway Crossing Behavior and Implications for Population Persistence" - **Charlene B. Hopkins** Shawn R. Kuchta and Willem M. Roosenburg: Ohio University, Email: ch183014@ohio.edu

16. "Biodiversity Study: GlenOak High School. Land" - **Gavin Nupp and Chad Palmer:** GlenOak High School, Canton, Ohio

17. "Stability of Dorsal Pattern and Experimentally-Induced Color Change Observed for Captive Cope's Gray Treefrogs" - **Kelsey A. Miller,** Donald P. Althoff, and Jordan D. Maxwell: University of Rio Grande, Rio Grande, Ohio. Email: dalthoff@.rio.edu

18. "Late-Season Hymenoptera Diversity Using Colored Vane Traps in Overgrown Fields at the Richfield Heritage Preserve (Summit Co., OH)" - **Lauren Leduc** Greenwell and R. Chris Stanton: Baldwin Wallace University

19. "2017 Herpetology Survey of the Richfield Heritage Preserve (Summit Co., OH)" - **Emily Briner**, Jess Ingle, and Chris Stanton: Baldwin Wallace University

20. "Project Wild Coshocton: A Camera-Trapping Program to Monitor Bobcats (*Lynx rufus*) in Coshocton County, Ohio" - **Abby Clark**[1], Jacob DeRodes[1], Chase Altier[2], J. Andrew Roberts[3], and Shauna L. Weyrauch[3]: [1]Department of Environment and Natural Resources, The Ohio State University (Columbus, Ohio), [2]College of Education and Human Ecology, The Ohio State University (Columbus, Ohio), [3]Department of Evolution, Ecology & Organismal Biology, The Ohio State University at Newark (Newark, Ohio)

21. "Reconstructing the Presettlement Vegetation of Cuyahoga County Ohio" - **Tylor Mahany** and Kathryn Flinn PhD: Baldwin Wallace University

22. "Microbial inoculation influences arbuscular mycorrhizal fungi community structure and nutrient dynamics in two temperate tree species" - **Andrew C. Lance**[a], David J. Burke[b,a], Constance E. Hausman[c], Jean H. Burns[a]: [a]Case Western Reserve University, Department of Biology, Cleveland, OH, [b]Holden Arboretum, Kirtland, OH, [c]Cleveland Metroparks, Cleveland, OH

23. "Relationship Between Digital Images Pixel Counts and Aquatic Vertebrate Biomass: The 5-Gallon Bucket Technique" - **Robert S. Miller,** Donald P. Althoff, Christian J. Morgan, Andrea L. Maxwell, John R. Schwartz, Colin F. Stanley, Wyatt E. Snodgrass, and John A. Blazer: University of Rio Grande, Rio Grande, Ohio. Email: dalthoff@.rio.edu

24. " Ohio Odonata Survey 2017: dragonflies and damselflies of Washington County" - **Kaitlyn Cozzens** and Dave McShaffrey: Marietta College Department of Biology and Environmental Science

1) Title: An Updated List of the Ants (Hymenoptera: Formicidae) of Ohio

Author: Kal Ivanov

Affiliation: Virginia Museum of Natural History, Department of Recent Invertebrates

Abstract:

I revisit Ohio's ant list thirteen years after the publication of Coovert's "Ants of Ohio". I update the list to accommodate 23 additional species and 32 name changes in species already on the list based on new survey work, literature records, and museum collections. At present, 140 species, including 10 ant exotics, are reliably reported from the state. These species represent most of the North American groups, lacking only the more tropical members of the subfamilies Ectatomminae and Pseudomyrmecinae. I also provide county level distributional information for the newly included species. Ohio's ant diversity is dominated by the genera *Formica* (26 species), *Strumigenys* (15), Myrmica (11), *Camponotus* (10), *Lasius* (10), and *Temnothorax* (10). With this update, I hope to encourage future explorations of Ohio's myrmecofauna where new records are undoubtedly to be expected.

Biography:

I received my Master's Degree in Entomology from Sofia University (Bulgaria), and my Ph.D. in Ecology from Cleveland State University. I am currently an Assistant Curator in the Department of Recent Invertebrates at the Virginia Museum of Natural History. My research interests are in the area of Formicidae (and Hymenoptera in general) taxonomy and natural history, biodiversity, community ecology, urban ecology, and invasion biology.

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2) Title: Short-term responses of fish community structure following re-meandering restoration of Eagle Creek (Garrettsville, OH)

Authors: Jennifer M. Clark and Justin J. Montemarano

Affiliations: Hiram College, James H. Barrow Field Station, and Armstrong State University

Abstract:

Channel reconfiguration is a common but debated method used to restore streams, often causing disturbance and producing subsequent negative impacts on biota.

Here, we report results from short-term assessment (i.e., one and three years post-restoration) of habitat variables (e.g., reach depth, substrate, and canopy cover) and fish community composition and structure (using electrofishing surveys; e.g., proportion of juveniles and tolerant fishes) from a 675 m section of Eagle Creek (Ohio) restored using channel re-meandering in August 2013. Mesohabitat analysis was not conducted as part of this study. Sites upstream and downstream of restoration efforts were also monitored. Surveys were completed in 10 separate 50 m stretches: one upstream control site, three new channel sites, two old channel sites, and three downstream sites. Following restoration, fish communities in downstream sites became more similar to new channel sites and diverged from the upstream control site over time, as reflected in increased proportions of juvenile and tolerant fishes. Shifts in fish communities were not explained by habitat variables. Diversity was significantly lower in new channel sites post-restoration than in the upstream control while downstream sites remained similarly high compared to the upstream control site over time. Overall, in the short-term, new channel colonizing communities were unable to recover to reflect upstream community composition and structure, and fish communities downstream of restoration were negatively impacted.

Biographies:

Jennifer Clark is an Associate 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 the consequences of re-meandering restoration on stream communities and the impacts of light pollution on macroinvertebrates and fishes.

Justin Montemarano is a Lecturer in the Biology Department at Armstrong State University (Savannah, GA). He received his PhD in Ecology from Kent State University in 2013. His research interests include abiotic and biotic controllers of decomposition dynamics in streams and wetland systems, crayfish effects in detrital processing in streams, and tropical biology.

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3) Title: Impacts of re-meandering restoration efforts on predation risk of juvenile crayfish (*Orconectes obscurus*)

Authors: Erica Dulka and Jennifer M. Clark

Affiliations: Hiram College and James H. Barrow Field Station

Abstract:

Re-meandering restoration in Eagle Creek (Garrettsville, OH) has led to shallower water levels, increased algae cover, and fewer large predatory fishes within the restored section vs. nearby upstream and downstream areas. Prior surveys in this system suggest that juvenile crayfish abundance is higher in the restored section than in upstream and downstream areas. The goals of this study were to 1) quantify fish predator size and 2) predation risk of juvenile crayfish in restored sections compared to deeper, forested control sites. To assess predator load, we used electrofishing surveys during July 2017 in four 30-m stretches in both control and restored sections. Eight juvenile crayfish were tethered to the stream benthos at each site for two nights both in July and August 2017 to assess predation risk (n = 128). Water depth and percent cover of refugia were measured at each tethering location. Overall, juvenile survivorship was significantly higher in restored than control sites (ANOVA, P = 0.0188). However, predatory fish total length was similar across sites (ANOVA, P = 0.6179). Further, water depth correlated with higher survivorship in shallower waters found in restored sites (r^2 = 0.60, P = 0.005). However, percent cover of refuge did not correlate with survivorship (r^2 = 0.09, P = 0.2703). Overall, this study suggests that re-meandering restoration efforts impact juvenile crayfish populations by increasing survivorship and may serve as a nursery zone. Although the size of fish predators was similar across sites, their abundance and stream depth may play a significant role.

Biographies:

Erica Dulka is a senior Biology, Environmental Sciences major and Natural History Minor at Hiram College. She spends a great deal of her time in nature hunting, fishing and gathering wild mushrooms. Her time spent in the outdoors has given her a vast interest in field biology, aquatics and ecology. This summer she gained experience in snake and butterfly surveys as well as field research in stream ecology. She has plans for attending grad school in the near future.

Jennifer Clark is an Associate 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 the consequences of re-meandering restoration on stream communities and the impacts of light pollution on macroinvertebrates and fishes.

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4) **Title**: Movement and population trends in the meadow jumping mouse (Zapus hudsonius) and woodland jumping mouse (Napaeozapus insignis) at Sunnybrook Preserve in Geauga County, Ohio using a mark-recapture approach: a summary of preliminary data.

Author: Dolly L. Crawford, Ph.D.

Affiliation: Department of Biology and Toxicology, Ashland University

Abstract:

The meadow jumping mouse (*Zapus hudsonsius*) and woodland jumping mouse (*Napaeozapus insignis*) exhibit distinct habitat requirements. Their presence is often positively correlated with habitat quality. However, little is currently known about the species in Ohio. This has, in part, led to *Napaeozapu*s listing as a Species of Concern in the state. We conducted a mark-recapture study at Sunnybrook Preserve in Geauga County, Ohio to evaluate the population status of both taxa. Passive integrated transponders (PIT-tags) were installed into captured jumping mice to identify individuals and to track their movements with ArcGIS *v*.10.4.1. PIT-tag data were also used to parameterize models in MARK *v*. 8 to evaluate whether all possible jumping mice were detected (i.e. probability of recapture) and to estimate population size. We parameterized models with constant recapture and survival probability, and used the Lincoln- Petersen estimator to estimate population size. Models were compared with the corrected Akaike's Information Criterion (AICc). To date, our surveys have documented 63 captures of *Zapu*s and 15 captures of *Napaeozapus*. The best fit model had the lowest AICc (209.9) and the fewest number of parameters (n = 2). Results demonstrate recapture probabilities for *Zapu*s and *Napaeozapus* of 36% and 5%, respectively. This result suggests that not all individuals available for capture have been documented to date. We also documented extralimital movements of *Zapus* that may be associated with use of hibernacula. These results, though preliminary, suggest the efficacy of mark-recapture studies at this location to further deduce population dynamics of both species.

Biography:

Dr. Dolly Crawford is a professor in the Department of Biology and Toxicology at Ashland University. Her research focus is to examine the influence of abiotic and biotic processes on the distribution of vertebrate taxa in North America. Recent work in this area includes long-term climate change impacts on the Mexican vole and habitat modeling for the Golden-winged Warbler. Currently, she is collaborating with the Geauga Parks District on a long-term project to examine the status and population dynamics of two species of jumping mouse in northeastern Ohio.

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5) Title: Assessing Incubation Status of Songbird Eggs Using FLIR Technology

Authors: Dustin M. Edens, Donald P. Althoff, and Lucille M. Williams

Affiliation: University of Rio Grande, Rio Grande, Ohio. **Email**: dalthoff@rio.edu

Abstract:

Monitoring of bluebird box trails by wildlife biologist and citizen scientists has been common place for the several decades. Typically, boxes are inspected every 3-7 days to document nest initiation and bowl formation, egg laying, incubation, and development of chicks. Eastern bluebirds (*Sialia sialis*) lay 2-7 eggs per clutch, whereas tree swallows (*Tachycineta bicolor*), lay 4-7 eggs. If personnel time is limited, the frequency of visits is reduced thereby limiting some details of individual nest chronology. Often it is important to determine within $\pm$1 days when incubation starts. Although it is possible to determine if incubation has started by touching eggs to assess if they are warm or not, handling of eggs is generally not permitted without agency authorization and is not recommended by the North American Bluebird Society. We employed Forward-Looking Infra-Red (FLIR) technology to determine the range of egg temperatures to assess the utility of this technology to better document the transition period from egg laying to onset of incubation. From April to June, box checks (n=52) of bluebirds, when less than the max clutch size per nest was achieved**,** revealed egg temperatures consistently less than 31.0^{o}C (mean=27.3^{o}C); corresponding temperatures for tree swallow box checks (n=55) were less than 32.0^{o}C (mean=24.6^{o}C). For box checks when max egg was achieved, eggs for both species were $\geq$37.4^{o}C. Thus, FLIR technology provides a reliable “non-touching” way to determine the egg-laying vs. incubation periods within 1 day, which is especially key when clutches reach the 3-6 eggs for these species.

Biographies:

Dustin Edens is currently a senior at the University of Rio Grande majoring in Wildlife Conservation.

Don Althoff is currently professor of wildlife conservation at the University of Rio Grande. He has a B.S. from the Ohio State University (1976), an M.S. from the University of Nebraska (1978), and a Ph.D. from Penn State University (1983).

Lucy Williams is currently a junior at the University of Rio Grande majoring in Wildlife Conservation.

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6) Title: A floristic inventory of three prairie-like openings in Strouds Run State Park, Athens County, Ohio

Authors: Marion Andrews Holmes and Philip D. Cantino

Affiliation: Ohio University

Abstract:

Three prairie-like openings are present on limestone-capped ridgetops at Strouds Run State Park in Athens County. Grassland openings are relatively uncommon on the unglaciated Allegheny plateau, and these sites contribute to the diversity and biological heritage of the park by providing habitat for locally uncommon species. Although previous inventories of the park have documented the presence and character of the openings, a thorough survey of all three sites had not yet been carried out. The openings were surveyed with monthly visits during the 2013 growing season, and frequent additional visits during the growing seasons in 2014, 2016, and 2017. Voucher specimens have been deposited in the Floyd Bartley Herbarium at Ohio University.

More than 129 species are present across the three sites. Plant communities are dominated by a mixture of forbs and grasses intermixed with woody species characteristic of limestone glades (e.g., *Celtis pumila* and *Juniperus virginiana*) and other open habitats (e.g., *Cercis canadensis* and *Rubus* spp.). *Andropogon gerardii* is the dominant grass. Prairie forbs such as *Gentiana alba* and *Physostegia virginiana* ssp. *praemorsa* are present in some of the openings. Community composition, species richness, and the presence of non-native species are highly variable among the three sites. Populations of species such as *G. alba* and *Silphium trifoliatum* are quite small and may be at risk due to deer browsing and competition with woody species. A management plan consisting of selective thinning of woody species is suggested to maintain the unique character and diversity of these sites.

Biographies:

Marion Andrews Holmes, PhD is a Visiting Research Scholar in the Department of Environmental and Plant Biology at Ohio University. Her work is focused on processes of forest community assembly after abandonment from agriculture with a special focus on the understory herb community; her research interests include vegetation dynamics, land-use history, and spatial ecology.

Philip D. Cantino, PhD is a Professor Emeritus in the Department of Environmental and Plant Biology at Ohio University. His academic research mostly focuses on the phylogeny and systematics of Lamiaceae and the development of a system of phylogenetic nomenclature for clades. He is currently dedicating much of his time to natural-area acquisition and preserve stewardship through the Athens Conservancy, a conservation land trust.

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7) Title: Assessing Spot Symmetry of Spotted Salamanders: the Impact of Training on Accuracy of Spot Counts

Authors: Andrea L. Maxwell, Donald P. Althoff, John A. Blazer, Robert S. Miller, Christian J. Morgan, Colin F. Stanley, John R. Schwartz, and Wyatt E. Snodgrass

Affiliation: University of Rio Grande, Rio Grande, Ohio. Email: dalthoff@.rio.edu

Abstract:

Amphibians are often monitored to assess ecosystem health, as they can indicate environmental contamination, reduced habitat quality, and productivity. Monitoring techniques range from aural surveys (non-invasive) to the collection of specimens (invasive). Davis and Maerz (2007) determined that spot symmetry—one side vs. the other—provides a consistent index to body condition for spotted salamanders (*Ambystoma maculatum*). The method, which requires counting left-right spots between the front and hind limbs, is less invasive and time consuming than obtaining mass or length metrics. Counts can be obtained in the field by counting spots or taking digital photos that require post-field processing. The latter has the advantage of confirmation in the lab with repeat counts by another individual. Because of the potential for inter-observer variation, we evaluated the accuracy of individuals to count spots on digital images having no training vs. specific training to count spots analysis for determining body condition and the influence of pre-marking the region of the salamander to be examined for spot counts on digital images. Both our novice and partially-trained groups improved the accuracy of their counts with additional training and lines marked on photos to define the count region. Picture quality had a significant positive effect (r=0.49, p=0.012) on the accuracy of counts, but the association was not as strong as expected. Overall, our findings indicate that even this simplistic method requires training designed to ensure the correct region for counting spots and some practice, whether for field or digital image counts.

Biographies:

Andrea Maxwell, Robert Miller, and Christian Morgan are currently seniors at the University of Rio Grande majoring in Wildlife Conservation. Each has earned an A.D. in Wildlife Sciences from Hocking College (2015-2016).

Don Althoff is currently a professor of wildlife conservation at the University of Rio Grande. He has a B.S. from the Ohio State University (1976), an M.S. from the University of Nebraska (1978), and a Ph.D. from Penn State University (1983).

John Blazer earned his B.S. in wildlife conservation from the University of Rio Grande (2017).

Colin Stanley is currently a senior at the University of Rio Grande majoring in Wildlife Conservation.

John Schwartz earned his B.S. in wildlife conservation from the University of Rio Grande (2017) and an A.D. in Wildlife Sciences from Hocking College (2014).

Wyatt Snodgrass is currently a senior at the University of Rio Grande majoring in Wildlife Conservation. He earned his A.D. in Fisheries Management and Aquaculture from Hocking College (2012).

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8) Title: Survey and identification of native and invasive earthworms under cover objects in the Cincinnati region.

Authors: Maria J. Murillo, Denise T. Baldrick, Brittany Hubbard, Keen A. Wilson, and Patrick C. Owen.

Affiliation(s): Biology Department, University of Cincinnati, Blue Ash College

Abstract:

Invasive Asian earthworms, particularly a complex of three cryptic species (*Amynthas agrestis*, *A. tokioensis*, and *Metaphire hilgendorfi*), are expanding their range across the eastern and central United States. Relative to native or naturalized earthworms, these invasive species have many negative effects on ecosystems such as destruction of leaf litter and disruption of soil nutrient cycling. Our goal was to document the occurrence of these invasive species relative to native/naturalized species utilizing the same habitats. We sampled under cover objects in both upland and riparian locations in several parks and natural areas in the Greater Cincinnati area, and we began a collection of preserved specimens. Cover objects consisted mostly of small sticks and logs in the upland areas and sedimentary rocks in the riparian areas. In our field identifications, we assigned the earthworms to invasive or native/naturalized categories based on behavior and external morphology. Twenty percent of cover objects had at least one earthworm, and greater than fifty percent of these worms were invasive. Invasive earthworms were more common that native/naturalized earthworms in upland areas, while native/naturalized earthworms were more common than invasive earthworms in riparian areas. A subset of these earthworms were preserved for later detailed morphological and genetic identifications. Invasive worms represented at least two of the species of the co-invasive complex, while native/naturalized earthworms included a variety of nine different lumbricid species. In future work we will be expanding our collecting and identifications to encompass a broader range of habitats and times of the year.

Biographies:

Maria Murillo – Maria is an undergraduate student at the University of Cincinnati and after graduation will be attending Xavier University to pursue an accelerated degree in nursing.

Denise Baldrick – Denise is an undergraduate student at the University of Cincinnati and is currently finishing her degree in biology.

Brittany Hubbard – Brittany has an undergraduate degree in equine science from Midway College and recently finished her associate's degree in biology/chemistry at UC Blue Ash.

Keen Wilson – Keen Wilson is a biology faculty member at UC Blue Ash and his research focuses on the molecular biology of invertebrates.

Patrick Owen – Patrick Owen is a biology faculty member at UC Blue Ash and his research focuses on invasive earthworms and their impact on native amphibians.

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9) Title: Summer Foraging Resource Selection of Local Bats.

Authors: Molly Simonis and Volker Bahn

Affiliation: Wright State University Department of Biological Sciences, Dayton, OH 45435

Abstract:

Conservation of bats requires detailed knowledge of their habitat use. In 2000, two female Indiana bats (*Myotis sodalis*) were radio-tagged to a maternal roost in Wright State University's (WSU) campus woods post-capture. Since Indiana bats were recorded on the property and are known to be selective when choosing optimal summer habitats, we determined the property would be sustainable for many Ohio bat species in summer months. Additionally, each bat species in Ohio is state and/or federally listed; thus, surveying all bat activity is critical for determining baseline habitat use and furthermore establishing conservation management strategies for the WSU campus woods. We hypothesized local bats would select primary forests over other habitats for foraging based on Ohio bat anecdotal natural history. We also predicted greater habitat selection in riparian areas because of the importance of hydric habitat proximity to foraging habitat selection. In Summer 2017, 10 walking bat acoustic routes were completed. Echolocation calls were recorded with a Wildlife Acoustic's Echo Meter Touch microphone and Echo Meter Touch app for iOS on an Apple iPad Air. We created a generalized linear model and determined probabilities of occupancy for different foraging habitats. We found the greatest probabilities of occupancy were in riparian habitats of both primary (0.71 probability) and secondary (1.00 probability) forests. Our model provides predictions for areas where bat activity is the greatest during summer months for use in conservation management strategies. Further analysis with acoustic classification and species models may also provide predictions for species specific management practices.

Biographies:

Molly Simonis is a Master's student in Biological Sciences at Wright State University in Dayton, OH. Her research interests specifically focus on native bats and include integrative and collaborative approaches to studying spatial wildlife ecology, ecophysiology, and wildlife disease. She is also employed as the Wildlife Research Fellow at Brukner Nature Center in Troy, OH.

Volker Bahn is an associate (tenured) professor in the Biological Sciences department of Wright State University. He has a PhD in Wildlife Ecology from the University of Maine and spent three years as a postdoc at McGill University. His main research interests relate to the distribution of species in the context of macro-ecology and conservation biology. He often employs advanced quantitative techniques for data analysis and visualization. He has published 22 peer-reviewed papers and has been cited over 600 times.

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10) Title: Use of Lindgren Funnel Traps to Assess Arthropod Diversity in a Hardwood Forest: Clear vs. Yellow Jar Solution Results

Authors: Wyatt E. Snodgrass, Donald **10)** P. Althoff, Paul L. Verga, Erik T. Brandt, Frank P. DePalma, Dustin M. Edens, Colin F. Stanley, Natasha M. Richmond, Lucille M. Williams, and Adrian A. Shields

Affiliation: University of Rio Grande, Rio Grande, Ohio. Email: dalthoff@.rio.edu

Abstract:

Deciduous forests can be expected to contain a diverse arthropod community. Sampling arthropods with considerable variety of vertical strata is challenging because no single method will yield complete representation of biodiversity. Furthermore, the type of trap or the color of killing solution used in the trap may bias results because of different visual preferences exhibited by different taxa. Using Lindgren funnel traps, we designed a study to determine the degree of overlap in species diversity of yellow colored killing solution verses a clear color killing solution. We deployed traps (n= 44, half with yellow colored solution and half with clear color solution) at 3 heights (approximately 3, 6, and 12-15 m) in white oak and shagbark hickory trees for 5-consecutive days in a deciduous woodlot in southeast Ohio in September 2017. We collected 413 specimens representing 70 species. Seventy-seven percent of the species were winged indicating they most likely arrived in the traps via flying to the trap or immediate area vs. already being on a tree prior to trap deployment. Clear solution jars registered 49 species, 29 of which were unique.

Yellow solution jars collections yielded 41 species, of which 21 species were unique. The Jaccard's coefficient (S^j=0.29) indicates that less than a third of species overlapped between the two samples. This outcome illustrates the need to take trap color or solution color into account when monitoring a site intended to document species composition and species richness as the main biodiversity metrics.

Biographies:

Wyatt Snodgrass is currently a senior at the University of Rio Grande majoring in Wildlife Conservation. He earned his A.D. in Fisheries Management and Aquaculture from Hocking College (2012).

Don Althoff is currently professor of wildlife conservation at the University of Rio Grande. He has a B.S. from the Ohio State University (1976), an M.S. from the University of Nebraska (1978), and a Ph.D. from Penn State University (1983).

Paul Verga is currently a junior at the University of Rio Grande majoring in Wildlife Conservation. He has earned an A.D. in Forestry Management from Hocking College (2014).

Colin Stanley, Frank DePalma, Dustin Edens, and Adrian Shields are currently seniors at the University of Rio Grande majoring in Wildlife Conservation.

Natasha Richmond and Lucy Williams are currently juniors at the University of Rio Grande majoring in Wildlife Conservation.

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11) Title: Dragons across Ohio: Citizen Scientists document biodiversity

Authors: MaLisa Spring, Jim Lemon, and Norman Johnson

Affiliation: The Ohio State University

Abstract:

Dragonflies and damselflies prey on an abundance of arthropods and serve as a food source for birds and bats. Ohio is home to 167 species of dragonflies and damselflies. Of these, 23 are state listed as endangered, threatened, or species of concern. The Ohio Dragonfly Survey is a citizen-science group attempting to document all species across the state to get a better understanding of the current distribution patterns. Thanks to the help of many dedicated naturalists across the state, we have been able to compile over 12,000 records from iNaturalist to incorporate into the survey in 2017. Over 163 new county records were reported, expanding the known distribution of several species (*Dythemis velox*, *Enallagma traviatum westfalli*, *Libellula incesta*). To date, 401 different users contributed data

via iNaturalist. Of these, 22 individuals contributed at least 100 observations to the survey. Fifty-two volunteers reported at least one county species record, with one individual reporting 26 new records using a targeted approach. A great deal of work remains for upcoming years: 37 of 88 counties in Ohio had fewer than 20 dragonfly and damselfly observations in 2017. Five counties - Brown, Gallia, Meigs, Morrow, and Pike - had no observations in 2017 and are priorities for the upcoming field season.

Biographies:

MaLisa Spring: MaLisa graduated from The Ohio State University with a Master's of Science in Entomology and Marietta College with a Bachelor's of Science in Biology. She has worked on many research projects including urban pollinator habitat management, bee richness and floral use, ladybeetle diversity, mangrove restoration in abandoned shrimp farms, and insect diversity in the tropics among many others. Now she is the State Coordinator for the Ohio Dragonfly Survey.

Jim Lemon: Jim has a Master's of Science in Entomology from The Ohio State University. Although retired from OSU, he stays busy as a Volunteer Naturalist in West Central Ohio; Co-Chair, Urbana Tree Commission; 2018 President of the Ohio Odonata Society; and SW Ohio Regional Coordinator, Ohio Odonata Survey.

Dr. Norm Johnson: Norm is the Martha N. and John C. Moser Chair in Arthropod Biosystematics and Biological Diversity and holds a joint appointment as Professor in the Department of Entomology and the Department of Evolution, Ecology & Organismal Biology. He is also the Director of the C.A. Triplehorn Insect Collection. His research program focuses on the systematics of parasitic wasps (Platygastroidea). He has a Ph.D from Cornell University and a B.S. from the SUNY College of Environmental Science and Forestry.

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12) Title: Evaluating potential effects of proximity to roadways in a road-naïve population of turtles

Authors: N.M. Weigand[1], C.M. Tonra[2], R.B. Wagner[1], V.D. Popescu[1]

Affiliations: [1] Ohio University, Athens, Ohio, [2] The Ohio State University, Columbus, Ohio

Abstract:

Roadways are the single largest man-made structure in the United States, and their ecological effects are conspicuous. Turtles are among the vertebrate taxa most affected by roads because of their low vagility and use of roadway habitats. In 2013,

the Wayne National Forest in southeastern Ohio was bisected by a high-traffic, high-speed highway, affecting a road-naïve population of Eastern Box Turtles (*Terrapene carolina carolina*), a Species of Concern in Ohio and at risk throughout its North American range. Using a control-impact study, we evaluated potential ecological and physiological effects of proximity to roadways, including habitat selection, home range size, and corticosterone as a proxy for chronic stress. Comparing road-impacted and unimpacted road-naïve turtles in otherwise similar patches of the same forest provided us with unique insight into animal behavior and the ecological impacts of the highway. The juxtaposition of traditional selection studies with hormone bioassays allowed us to take a comprehensive approach to understanding animal/road ecology, and the novel use of keratin for corticosterone testing provided an interesting temporal facet. Overall, we found no differences in home range sizes and habitat selection between sites, although females demonstrated significantly larger ranges than males. While we found higher corticosterone levels in females, we found no significant differences based on site. These results suggest that proximity to roads has potentially limited influence on Eastern Box Turtles. Although this is positive news for the turtles, roads remain likely to contribute to population declines through direct mortality.

Biographies:

Marcel Weigand – Marcel is an MSc candidate at Ohio University in the Ecology and Evolutionary Biology program. Her research focuses on the effects of anthropogenic habitat fragmentation on herpetofauna in southeastern Ohio. She previously earned an MA in Geography from Western Illinois University.

Dr. Christopher Tonra – Chris is an Assistant Professor in Avian Wildlife Ecology at The Ohio State University. He is a conservation biologist who integrates the fields of behavior, physiology, and ecology. He earned a BA in Anthropology from the State University of New York, an MSc in Wildlife Biology from Humboldt State University, and a PhD in Biology from the University of Maine. He was awarded a postdoctoral fellowship from the Smithsonian Conservation Biology Institute and a George Didden Conservation Biology Fellowship from the Smithsonian National Zoo.

Ryan Wagner – Ryan is pursuing a BSc in Wildlife and Conservation Biology at Ohio University and is a field technician in the Popescu Conservation Biology Lab. His photograph of an Eastern Garter Snake was selected for the 2018 Ohio Wildlife Legacy Stamp.

Dr. Viorel Popescu – Viorel is an Assistant Professor of Conservation Biology at Ohio University. His research interests broadly include wildlife ecology and conservation, herpetology, mammalian predators, and conservation planning. He earned a BSc in Environmental Science from the University of Bucharest, Romania, an MSc in Conservation Biology from the State University of New York - College of Environmental Science and Forestry, and a PhD in Wildlife Ecology from the University of Maine. He pursued wildlife ecology and biostatistics as a postdoctoral scholar at the University of California Berkeley, and renewable energy and

conservation planning as a David H. Smith Conservation Research Fellow at Simon Fraser University, British Columbia, and the University of California Santa Cruz.

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13) Title: Comprehending Virginia and Sora Rails and the Dynamic Wetland Plant Communities They Live In

Author: Olivia Widenmeyer

Affiliation: Ashland University

Abstract:

Virginia Rails (*Rallus limicola)* and Sora Rails (*Porzana Carolina)* are a group of wetland birds. A limited amount of research has focused on these reclusive birds. The purpose of this project is to expand our investigation of the Rail activity within and around the Ashland University Black Fork Wetlands. The bulk of fieldwork is restricted to spring and early summer when these birds are present. Presence/absence surveys were conducted beginning in late winter and early spring. Once birds are present, trapping attempts begin. In a previous study we determined that rails are active in three distinct areas within Ashland University's Black Fork wetlands as well as two other adjacent wetlands. Rails were captured at these locations in cloverleaf traps, they were banded and radio-transmitters were applied to some. Specifically, this year, we caught seven Virginia Rails and radio tracked four. Information on these birds is significant as they are listed as "Species of Concern" by Ohio Department of Natural Resources. By tracking these birds, we were able to gather specific information on their nesting sites, the size and shape of their foraging areas, and their movements between the distinct wetland areas. Additionally, feather clippings were taken to determine lead concentrations of the captured Rails. Levels were determined through spectroscopy and found to be low.

Biography:

Olivia Widenmeyer grew up in West Salem, OH and graduated from Ashland University in May of 2017. She majored in Biology with minors in Chemistry, Psychology, and Religion. While at Ashland University she was the president of the Biology honorary. Olivia received a senior research award from the Ashland University department of Biology and Toxicology for her 3 years of research on the Rails. This May she will be attending Baldwin Wallace and starting their Master of Physician Assistant program

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14) Title: GIS-based Analysis of Land Cover Types Associated with Kestrel Occupancy of Nest Boxes in Southeast Ohio

Authors: Lucille M. Williams, Donald P. Althoff, and Robert L. Hopkins II

Affiliation: University of Rio Grande, Rio Grande, Ohio. Email: dalthoff@.rio.edu

Abstract:

The American kestrel (*Falco sparverius*), a secondary cavity nester like many obligate cavity-nesting songbird species, has benefitted from nest boxes installed at locations assumed to meet all other habitat requirements. Nest boxes mounted on billboard posts and the backs of road signs—especially along 4-lane highways—are becoming more common place because of the perceived cover mix associated with these landscapes. Based on monitoring kestrel occupancy of nest boxes (n=37) from 2015-2017 in southeast Ohio, we were able to create a database of occupied vs. unoccupied sites, as well as documenting the presence/absence of European starlings (*Sturnus vulgaris*) – an apparent competitor for nesting cavities. Using this database, we conducted a GIS-based analysis of land cover across multiple scales for each site, with the objective of identifying a suite of landscape cover features that might enable deployment of nest boxes in the region with greater usage by kestrels. Using principal components analysis coupled with k-means clustering we identified two landscape niche clusters. One cluster was occupied by kestrels and starlings, the other was occupied by starlings only. The kestrel-occupied cluster had 10-40% herbaceous land and < 15% cropland across all spatial scales, with a high percentage of forest being important at the largest scale. A secondary predictor within the kestrel-occupied cluster was whether starlings established occupancy before kestrels in a given year. The starling-only cluster had more cropland and less forest cover. Future efforts should take these trends into account to maximize the use of nest boxes by kestrels.

Biographies:

Lucy Williams is currently a junior at the University of Rio Grande majoring in Wildlife Conservation.

Don Althoff is currently professor of wildlife conservation at the University of Rio Grande. He has a B.S. from the Ohio State University (1976), an M.S. from the University of Nebraska (1978), and a Ph.D. from Penn State University (1983).

Rob Hopkins is currently associate professor of wildlife conservation at the University of Rio Grande. He has a B.S. and M.S. from Morehead State University (2003, 2005) and a Ph.D.from Southern Illinois University (2009).

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15) Title: Amphibian Roadway Crossing Behavior and Implications for Population Persistence.

Authors: Charlene B. Hopkins Shawn R. Kuchta and Willem M. Roosenburg

Affiliation: Ohio University, Email: ch183014@ohio.edu

Abstract:

As roadways reduce amphibian population sizes, disrupt connectivity, and degrade habitat mitigation measures are increasingly being implemented. Understanding the impacts of roads and roadway mitigation measures is essential. We observed roadway crossing behavior of five amphibian species along a two-lane highway in Southeastern Ohio to assess crossing speed, crossing efficiency, and crossing success. We also collected information on traffic variables along the roadway. Using this data, we will analyze the potential for population persistence.

Biography:

Charlene B. Hopkins is a graduate student at Ohio University advised by Dr. Shawn R. Kuchta and Dr. Willem M. Roosenburg. She is studying the impacts of roadways and roadway mitigation measures on amphibians. Charlene has worked on field ecology projects in 11 states, served in Peace Corps Senegal, and earned her BS from Michigan State University.

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16) Title: Biodiversity Study: GlenOak High School. Land

Authors: Gavin Nupp, Chad Palmer

Affiliation: GlenOak High School, Canton, Ohio

Abstract

When the GlenOak High school campus was constructed in 2007, several acres were set aside as the Land lab, an area of old field habitat. The GlenOak Bioblitz has implemented citizen science, through the use of the application iNaturalist, to survey the ecology of this habitat, and to create classroom resources. This research was done with the objective of surveying the biodiversity of the GlenOak Land Lab in Stark County, Ohio. Funding was provided by the Ohio Biological Survey for specimen collection. The properties under study are the GlenOak Land Lab (5.5 acres), the Oakwood Wetland and Woods (6.6 acres), and Veterans Park (40 acres). A variety of habitats ranging from hardwood forest, pond, marsh, and old field are

represented on these adjacent, public parcels. The method employed was the use of the citizen science app iNaturalist. iNaturalist allows users to submit observations of species they encounter, with geotags and picture evidence. As of January 2018, 97 distinct species have been recorded, from 216 total observations, and 18 contributors. The most frequent observation is Queen Anne's Lace, with 14 observations. The most frequently observed animal is the Monarch, with 6. 27% of the species observed are animals, with 69% plants, with a single observation of a Fungi and Wolf's Milk (kingdom Protozoa). The majority of species are represented by a single data point. 18% of species observed are known to be non-native. This baseline data will be useful for further ecological research at these public campuses.

Biographies

Gavin Nupp is a senior at GlenOak High School in Canton, OH, and will be attending the Ohio State University as the class of 2022. He participates in Science Olympiad, FFA, and National Honor Society. He serves on the National Youth Leadership Council for Trout Unlimited.

Mr. Chad Palmer has been a Science Teacher at GlenOak High School for the past 21 years and an Adjunct Professor at The University of Akron for 9 years. He developed the high school STEM program at GlenOak High School in 2013. He is a National Science Teachers Association, Cleveland Zoological Society and Ohio Biological Survey member.

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17) Title: Stability of Dorsal Pattern and Experimentally-Induced Color Change Observed for Captive Cope's Gray Treefrogs

Authors: Kelsey A. Miller, Donald P. Althoff, and Jordan D. Maxwell

Affiliation: University of Rio Grande, Rio Grande, Ohio. Email: dalthoff@.rio.edu

Abstract:

Mark-recapture techniques are widely used for monitoring populations for a variety of species. Marks on individuals can be permanent or temporary—natural (i.e., strips, spots, blotches, etc.) or artificial (i.e., tags, clips, ink, etc.). The ideal artificial marks should be as free as possible of stress to the animal, easy to apply, and cost effective. However, invasive methods are increasingly being replaced by "digital ID" as digital image analysis software programs facilitate the individual identification. Cope's gray treefrogs (*Hyla chrysoscelis*) represent one of many amphibian species that appear to have variable blot-like patterns among individuals allowing for natural "mark" ID. During Phase I of our research, we evaluated this by monitoring dorsal pattern stability for individuals (n=9) over a 9-month period. Dorsal blotch outline patterns of all individuals remained unchanged indicating that use of these natural markings is an option for tracking "marked individuals". During Phase I we noted

modest color change when individuals were transferred outside their lab refugia to be photographed. This prompted our Phase II experiment whereby we evaluated for 10-minute observation bouts the overall color consistency of the back and flank regions of frogs (n=4) placed in a chamber with a different background that the lab refugia. Individuals subjected to 10-minute exposure to a yellow background in the observation chamber did exhibit a color shade change—typically with 6-8 minutes. Similar change was not noted when the camo-background trials were conducted. Despite this relatively rapid color morphing, the outline of the dorsal blot area(s) remained unchanged.

Biographies:

Kelsey Miller is currently a junior at the University of Rio Grande majoring in Wildlife Conservation.

Don Althoff is currently professor of wildlife conservation at the University of Rio Grande. He has a B.S. from the Ohio State University (1976), an M.S. from the University of Nebraska (1978), and a Ph.D. from Penn State University (1983).

Jordan Maxwell earned her B.S. in wildlife conservation from the University of Rio Grande (2016) and an associate degree in Wildlife Sciences from Hocking College (2014). She currently is program coordinator for the Aquaculture Boot Camp 2 at the Ohio State University South Center in Piketon.

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18) Title: Late-Season Hymenoptera Diversity Using Colored Vane Traps in Overgrown Fields at the Richfield Heritage Preserve (Summit Co., OH)

Authors: Lauren Leduc Greenwell and R. Chris Stanton

Affiliation: Baldwin Wallace University

Abstract:

The Richfield Heritage Preserve is a 336-acre property in Summit County, Ohio that is currently serving as a field station for Baldwin Wallace University. The preserve contains a variety of terrestrial and aquatic habitats but very little research has been conducted to document the biodiversity found there. The objectives of this project were to 1. sample the autumnal insect diversity found in the un-mowed fields (paying special attention to the pollinating bees), and 2. identify any uncommon insect occurrences. A pair of blue and yellow vane traps, containing 70% ethyl alcohol, were hung from metal hooks in six field locations just above vegetation levels. After approximately 48 hours, the traps were poured thru a strainer and the contents taken to a lab to be sorted and identified. Trap dates ranged from August 28, 2017 to November 18, 2017, with the greatest number of specimens collected on October 22, 2017. Blue traps collected significantly more specimens than yellow traps and

insect activity ended in mid-November after a heavy freeze. A total of 10 insect Orders was collected along with spiders, centipedes, and a snail. Of the insects trapped, the majority were Hymenopterans from the Families Apidae and Halictidae. Few studies have focused on late-season bee assemblages so this project is unique, however the results do not appear to be unusual for northeast Ohio.

Biographies:

Lauren Leduc Greenwell is from Lakewood, Ohio and is a recent graduate from Baldwin Wallace University. She holds an adjunct faculty position with Lorain County Community College Department of Math & Science, is a supplemental instructor for General Microbiology at Lorain County Community College, and is a seasonal Naturalist with Cleveland Metroparks. She plans to attend graduate school in the future for ecology & environmental biology.

R. Chris Stanton is a professor of biology at Baldwin Wallace University. He earned a Bachelor of Arts degree in English from Wittenberg University, a Master of Science degree in entomology and Plant Pathology from the University of Tennessee, and a Doctor of Philosophy degree in entomology from The Ohio State University. He has been teaching at Baldwin Wallace for the past 17 years

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19) Title:2017 Herpetology Survey of the Richfield Heritage Preserve (Summit Co., OH)

Authors: Emily Briner, Jess Ingle, and Chris Stanton,

Affiliation: Baldwin Wallace University

Abstract:

The Richfield Heritage Preserve is a 336-acre property in Summit County, Ohio that is currently home to the Baldwin Wallace University Field Station. A variety of terrestrial and aquatic habitats can be found on the property but very little research has been conducted to document the biodiversity there. The objectives of this project were to 1. document any reptile and amphibian species found at the preserve and 2. identify important areas where these species occur so that these locations can be protected. Most of the search effort for reptiles and amphibians took place in March and April of 2017 and concentrated on streams, lakes, and wet areas from natural seeps. Wooden cover boards were placed on the property during the summer and fall seasons. A total of 20 species was documented in 2017—7 species of frogs and toads, 6 species of salamanders and newts, 4 species of snakes, and 3 species of turtles. The most important areas to protect include Spif's Garden, the abandoned swimming pool, the wetland area of the lower lake, and the natural seeps that occur at the north end of the property. It is very likely that more reptiles and amphibian species can be found at the preserve but more time is needed to survey for these animals.

Biographies:

Emily Briner is a 2017 graduate of Baldwin Wallace University. She earned her Bachelor of Science in biology but plans on continuing her education in the coming years. Her current career goal is marine conservation with a focus on sea turtle nesting.

Jess Ingle acquired a Bachelor of Science degree in biology from Baldwin Wallace University in May of 2017. During her time there, she was a member of the STEM Scholars program for four years and a Mental Health Therapy Dog trainer for two years. She is currently working at Southwest General Health Center in Geriatric Behavioral Health.

R. Chris Stanton is a professor of biology at Baldwin Wallace University. He earned a Bachelor of Arts degree in English from Wittenberg University, a Master of Science degree in entomology and Plant Pathology from the University of Tennessee, and a Doctor of Philosophy degree in entomology from The Ohio State University. He has been teaching at Baldwin Wallace for the past 17 years.

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20) Title: Project Wild Coshocton: A Camera-Trapping Program to Monitor Bobcats (*Lynx rufus*) in Coshocton County, Ohio

Authors: Abby Clark*, Jacob DeRodes*, Chase Altier**, J. Andrew Roberts***, and Shauna L. Weyrauch***

Affiliations: *Department of Environment and Natural Resources, The Ohio State University (Columbus, Ohio), ** College of Education and Human Ecology, The Ohio State University (Columbus, Ohio), ***Department of Evolution, Ecology & Organismal Biology, The Ohio State University at Newark (Newark, Ohio)

Abstract:

The bobcat (*Lynx rufus*) is an important apex predator native to Ohio. Once found throughout the state, they were extirpated by the mid-1800s due to habitat loss and over-hunting. The bobcat was listed as endangered in Ohio in 1974, and populations slowly recovered. In 2014 they were removed from Ohio's threatened and endangered species list. These decisions by Ohio Division of Wildlife (ODW) were based on reported sightings, which have seen a steep increase since 2006. Much of the reported increase has been due to submitted photographs from trail cameras by hunters and landowners, which may bias the index of abundance. We are conducting a long-term program of camera trapping, the primary goal of which is to document the distribution and occupancy dynamics of bobcats in central Ohio. In 2017, we conducted baseline four-week-long surveys of 27 sites throughout Coshocton and southern Holmes counties. We found bobcats at 14 and coyotes at

15 of those sites; 10 sites had both bobcats and coyotes. In 2018, we created a map of our study area overlain with a 49-cell-grid, each cell being the size of a male bobcat's home range. We randomly selected 27 cells in which to establish field sites for future camera trapping surveys. We will repeat annual camera trapping surveys of these sites and assess proportion of area occupied by bobcats over time. We will also test whether the presence of coyotes influences the ability of bobcats to occupy areas, and whether coyotes alter diel patterns of bobcat activity.

Biographies:

Abby Clark is a sophomore in the Department of Environment and Natural Resources at The Ohio State University studying Environmental Policy and Decision Making with a specialization in Communication and Behavior Change. She has a focus on media and film and plans to incorporate this into her major in the years to come. Abby hopes to covey her knowledge of the environment and ecology through media.

Jacob DeRodes is a sophomore in the Department of Environment and Natural Resources at The Ohio State University. He is pursuing a Bachelor of Science in environmental science with a specialization in ecosystem restoration, and has great passion for aiding in the recovery of landscapes damaged by industrial activity both locally and across the country. He hopes to one day provide consultation to companies who plan to use natural resources to help balance human needs with environmental limitations.

Chase Altier is a senior in the College of Education and Human Ecology at The Ohio State University majoring in Exercise Science. He would like to become a physical therapist.

J. Andrew Roberts:

- BS (1995) in Neurobiology at Purdue University
- MS (2001) in Chemical Ecology at the University of Cincinnati
- PhD (2003) in Behavioral Ecology at the University of Cincinnati
- Dr. Roberts is a behavioral ecologist whose main research interests are in the evolution of animal communication and social behavior. He applies an integrative approach to his research program, incorporating techniques from several disciplines to address interesting questions about the evolution of animal signals, sexual selection and mate choice, and group formation and social behavior. At present, much of his research concerns environmental constraints on the evolution of animal signals and signaling behavior.

Shauna L. Weyrauch:

- B.S. (1995) and M.S. (1997), Biology, Wright State University, Dayton, Ohio

- Ph.D. (2004), Evolution, Ecology & Organismal Biology, The Ohio State University, Columbus, Ohio
- Dr. Weyrauch is primarily a field-oriented ecologist and studies questions of conservation interest, including effects of habitat fragmentation on community structure and genetic diversity in amphibians, amphibian population declines, and the status of the recovering bobcat population in central/eastern Ohio.

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21) Title: Reconstructing the Presettlement Vegetation of Cuyahoga County Ohio

Authors: Tylor Mahany and Kathryn Flinn PhD

Affiliation: Baldwin Wallace University

Abstract:

This study looked at the early land surveys of the Connecticut Western Reserve, with the specific goal to reconstruct the vegetation community of Cuyahoga county Ohio. Specifically, within the survey records tree species and the position which it was recorded, to determine the dominance of the tree species within the geographical area. The data we collected was then compared with data collected from 2014 vegetation surveys done by the Cleveland Meteroparks system, to determine changes in the regional plant community. The results of this study showed that there was a decrease in frequency of *Fagus grandifolia, Castanea dentata,* and *Tilia Americana.* There was an increase in *Acer spp. Prunus serotine, and Ulmus spp.* There is changes in community dominance, *Fagus grandifolia* and *Quercus spp.* Dominated forest decreased, and *Acer spp.* dominated forest increase from 11% to 64 %.

Biography:

Tylor Mahany: Currently a student at Baldwin Wallace University, Majoring in Biology with minor focuses in Geology and Chemistry. Future goals include going to graduate school to further education in Environmental Science, Erath Sciences, or a related field.

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22) Title: Microbial inoculation influences arbuscular mycorrhizal fungi community structure and nutrient dynamics in two temperate tree species.

Authors: Andrew C. Lance[a], David J. Burke[b,a], Constance E. Hausman[c], Jean H. Burns[a]

Affliliations: [a]Case Western Reserve University, Department of Biology, Cleveland, OH, [b]Holden Arboretum, Kirtland, OH, [c]Cleveland Metroparks, Cleveland, OH

Abstract:

Manipulation of soil microbial communities is a common method of enhancing plant survivorship and growth during ecological restoration. Arbuscular mycorrhizal fungi (AMF) are an important group of soil fungi, which improve plant nutrition and alter patterns of nutrient cycling in the rhizosphere. Inoculating plants with soil collected from a reference community ("whole soil transfers") has been shown to increase AMF colonization and plant growth in comparison to commercially produced inoculums; however, the influence of "whole soil transfers" on nutrient cycling and acquisition remains poorly described.

We investigated the influence of microbial inoculants on AMF communities and nutrient dynamics by inoculating *Liriodendron tulipifera* and *Prunus serotina* tree saplings sourced from three populations with (1) commercially produced microbial inoculum, (2) soil collected from a mature forest near our restoration site, or (3) water. We predicted inoculation would elicit significantly different AMF communities and that trees receiving "whole soil transfers" would have increased nitrogen and phosphorus content in both soils and foliar tissue.

Analysis of TRFLP data indicated a significant effect of inoculation treatment on AMF community structure. *Prunus* trees inoculated with "whole soil transfers" exhibited a higher soil carbon to nitrogen ratio and soil ammonia content. In *Liriodendron*, inoculation with commercial inoculum or "whole soil transfers" significantly increased soil inorganic phosphorus in comparison to the control treatment. Foliar inorganic phosphorus in *Liriodendron* was significantly greater in the "whole soil transfer" treatment when compared to the commercial inoculum treatment. In addition, a significant population by treatment interaction influenced soil inorganic phosphorus in *Liriodendron.*

Biographies:

ACL- Ph.D. Candidate at Case Western Reserve University-Department of Biology
DJB- Chief Program Officer, Science, Horticulture, and Conservation, Holden Forests and Gardens
CEH- Plant and Restoration Ecologist, Cleveland Metroparks
JHB- Associate Professor of Biology, Case Western Reserve University

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23) Title: Relationship Between Digital Images Pixel Counts and Aquatic Vertebrate Biomass: The 5-Gallon Bucket Technique

Authors: Robert S. Miller, Donald P. Althoff, Christian J. Morgan, Andrea L. Maxwell, John R. Schwartz, Colin F. Stanley, Wyatt E. Snodgrass, and John A. Blazer

Affiliation: University of Rio Grande, Rio Grande, Ohio. Email: dalthoff@.rio.edu

Abstract:

Monitoring vertebrate productivity and diversity in aquatic ecosystems often requires collection of specimens. Specimens are often processed to determine abundance, taxonomic identification (i.e., at the order, family, genus, or species level), and size (i.e., length and /or mass). Most of these processes require some degree of invasiveness and even, perhaps, permanent removal of specimens from the sampling site. Furthermore, obtaining overall biomass can be a challenging undertaking because of the additional handling time to place individuals on a platform scales or suspend them from spring scales. Both approaches add to the specimen's overall stress. By taking digital photos of the surface area of the commonly used 5-gallon bucket we evaluated the potential of using dark pixel count ratios (using Image J software) to predicted biomass of aquatic vertebrates. Our collection of specimens was obtained using flexible funnel traps in Jackson and Gallia counties, Ohio. Vertebrates captured included amphibians (red-spotted newts, spotted salamanders, and frogs—both tadpoles and adults) and fish (mosquito fish and sunfish spp). Our regression analysis of 5-gallon bucket samples (n=47) resulted in R^2=0.75. A higher degree of predictability of biomass using pixel counts was achieved when samples were sorted to a particular taxa (R^2=0.96 to R^2=0.99). Thus, the 5-gallon bucket digital image approach we developed shows considerable promise for field applications because it can result in reduced handling time in the field as well as reduced stress and elimination of sacrificing specimens captured in traps and/or nets when the metric of biomass is deemed appropriate.

Biographies:

Robert Miller, Christian Morgan, and Andrea Maxwell are currently seniors at the University of Rio Grande majoring in Wildlife Conservation. Each has earned an associate degree in Wildlife Sciences from Hocking College (2016).

Don Althoff is currently professor of wildlife conservation at the University of Rio Grande. He has a B.S. from the Ohio State University (1976), an M.S. from the University of Nebraska. (1978), and a Ph.D. from Penn State University (1983).

John Schwartz earned his B.S. in wildlife conservation from the University of Rio Grande (2017) and associate degree in Wildlife Sciences from Hocking College (2014).

Colin Stanley is currently a senior at the University of Rio Grande majoring in Wildlife Conservation.

Wyatt Snodgrass is currently a senior at the University of Rio Grande majoring in Wildlife Conservation. He earned his associate degree in Fish Science and Aquaculture from College (2012).

John Blazer earned his B.S. in wildlife conservation from the University of Rio Grande (2017).

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24) Title: Ohio Odonata Survey 2017: dragonflies and damselflies of Washington County

Authors: Kaitlyn Cozzens and Dave McShaffrey

Affiliation: Marietta College Department of Biology and Environmental Science

Abstract:

Dragonflies and Damselflies were collected and/or photographed in adult or larval form from 33 sites representing both lotic and lentic habitats in Washington County, Ohio, from May to November, 2017. 143 specimens were collected; these represented 39 species. 27 of those species were also photographed, and another 8 species were photographed, but not collected. A total of 47 species were recorded between the 2 methods. 9 new county records were made as a result of this survey; combined with 6 county records made between 2002 and 2017 this increases the total number of species in Washington County from 58 at the end of the first Ohio Odonata Survey to 73 in 2017. Currently there are 51 species of dragonflies and 22 species of damselflies known from Washington County, Ohio.

Biographies:

Kaitlyn Cozzens is a 2017 graduate of Marietta College. She performed this research as part of her senior capstone project. Kaitlyn is currently preparing for Peace Corps deployment to Africa.

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, forensic entomology, biogeography of Odonata, and other stuff. He is currently on the coordinating committee for the new Ohio Odonata Survey.