

2024 Northeast Natural History Conference Poster Abstracts

Listed in alphabetical order by first-listed author/presenter. Code at the bottom of each abstract indicates when in the conference schedule the presentation will be given: Day -Poster # (thus, for example, Sun-21 indicates the presentation will be poster #21 in the morning and afternoon Sunday poster sessions). Authors in bold are the presenting authors.

The Use of Road Culverts as Wildlife Crossings

Lucas Andujar (Pace University, Pleasantville, NY) and Mike Rubbo (Pace University, Pleasantville, NY)

Abstract - Habitat fragmentation caused by human development, particularly through the expansion of road networks, poses a significant threat to biodiversity. Culverts, commonly installed at road crossings over rivers or streams, offer a potential pathway for wildlife to navigate these barriers. However, the efficacy of culverts in facilitating wildlife movement remains poorly understood. To address this, we assessed the use of culverts by wildlife in northern Westchester County, NY. We deployed camera traps at 14 culverts of varying construction design to monitor wildlife usage. We observed 14 species utilizing culverts to cross under roads. Open-bottomed culverts as well as culverts with exposed sediment or concrete lips had higher levels of animal usage. Moreover, the number of animal observations increased as the depth of water in culverts decreased. These data suggest that to facilitate the use of culverts by wildlife, it is important to maintain areas of exposed substrate (natural or artificial). While more data is necessary to fully evaluate the efficacy of culverts for road crossings, these data suggest that, with the appropriate design, culverts can be incorporated into connectivity planning for wildlife.

Sat- 27

Bugging Out: Terrestrial Arthropod Communities within a Boreal Peatland Complex of Upstate New York

Annie Arnold (SUNY Plattsburgh, Plattsburgh, NY), Stephen Langdon (Shingle Shanty Preserve and Research Station, Adirondack Park, NY), Timothy Mihuc (SUNY Plattsburgh, Plattsburgh, NY) Michale Glennon (Adirondack Watershed Institute, Paul Smith's College, NY), and Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Boreal peatlands provide rare habitats, ecosystem services, and support high biodiversity. Climate change is impacting these systems, particularly at their southern extent in the boreal-temperate ecotone (BTE). Warming temperatures coupled with other abiotic shifts (e.g., hydrology, soil chemistry) have led to increased rates of tree encroachment into historically open (unforested) bog environments and are potentially changing ecosystem services and function associated with these systems. Terrestrial arthropods within boreal peatlands are valuable to trophic interactions and as acute responders to climatic shifts are early bioindicators of ecosystem change. In this study, we collected terrestrial arthropods at the Shingle Shanty Preserve and Research Station, in the Adirondacks of Upstate New York, located at the southern range of the North American BTE. The objectives of this study were to (1) create a catalog of terrestrial arthropods within a southern boreal peatland, and (2) analyze relationships between arthropod communities and vegetation structure and identify significant differences in communities between the open-to-forested bog gradient. We collected arthropods monthly in 3 peatland sites from June to September in 2023. At each site, we established transects in the forested, transition, and open bog, with 3 plots located along each transect (total of 27 plot locations). Ground vegetation was collected and placed in Berlese funnels to collect ground dwelling arthropods. We performed ground and aerial sweep netting at four 90° angles, 5 m from each plot center. We set Lindgren funnel traps at the middle plot of each transect at each site (totaling 9 traps), and collected arthropods and reset funnels at each monthly collection. Preliminary results show there being 10 arthropod orders present at the sites, the most abundant being Araneae, Coleoptera, and Diptera, spanning 130 families. We measured peatland structure, species composition, and understory composition in October 2023. Tree density (predominantly *Picea mariana* [Black Spruce]) varied from 12,223 to 0 stems/ha along the forested-to-open bog gradient. Understory vegetation was dominated by sphagnum moss. Ongoing analyses will relate arthropod community assemblages to peatland structure and will help contribute to the growing body of knowledge of arthropod communities within boreal peatland ecosystems, in light of shifting ecosystem dynamics.

Sun- 31

Changes in the Vertical Structure of Lake Champlain Zooplankton After the Invasions of Spiny Waterflea and Fishhook Waterflea

Marshall Arnwine (SUNY Plattsburgh, Plattsburgh, NY), Timothy Mihuc (SUNY Plattsburgh, Plattsburgh, NY), Zachary Cutter (SUNY Plattsburgh, Plattsburgh, NY), and Steve Cluett (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - It is well documented that zooplankton exhibit diel vertical migration (DVM), moving higher in the water column at night and residing deeper during the day. Herbivorous zooplankton are thought to perform DVM as a strategy of visual-predation avoidance, sacrificing growth and foraging opportunities by avoiding food-rich illuminated waters in the daytime to reduce predator-detection rates. Two invasive predatory Cladocerans, *Bythotrephes longimanus* (Spiny Waterflea) and *Cercopagis pengoi* (Fishhook Waterflea), have invaded Lake Champlain in the past decade, where both species rapidly reached high abundances during their invasion years (2014 and 2018, respectively). Spiny Waterflea abundance declined in 2016 whereas Fishhook Waterflea abundance has remained high. As visual predators of herbivorous zooplankton, these invaders may have influenced the zooplankton diel vertical community structure in Lake Champlain, which could have cascading effects on the lake food web. We took daytime and nighttime samples in 2013, 2014, 2015, 2016, 2019, and 2023 at 5-m depth intervals at a 50-m-deep site in Lake Champlain using closing plankton nets. We used the data obtained to determine the vertical structure of the zooplankton community before and after the invasive-species introductions. The results show changes in the diel vertical assemblages of several native zooplankton taxa associated with invasion years.

Sun- 18

A Survey of the Fruiting Plants and Their Insect Parasites in the Forests of Western New York

Thomas Back (SUNY Geneseo, Geneseo, NY) and Suann Yang (SUNY Geneseo, Geneseo, NY)

Abstract - In Western New York's agricultural regions, non-native, cultivated and native plants occur near each other. The distribution of these plants potentially affects the instance of parasitism by insects. This study surveys the interactions between parasitising insects and their host plants in forests that are adjacent to farms of cultivated fruits. We hypothesize that the forests surrounding farms act as reservoirs for parasites during the times when fruits are absent from the farm. Additionally, fruit density may impact rates of parasitism, with higher density correlated with higher rates of parasitism. Since fall 2023, we have characterized host-parasite interactions by sampling late-season fruiting plants in forests adjacent to farm fields, at 2 separate farms. Preliminary results reveal that a majority of the larvae are found in a single species, *Frangula alnus* (Glossy Buckthorn). We discuss how effective management of pest species on farms may also need to include reducing the abundance of alternate host plants in neighboring forests.

Sun- 39

Effects of Climate Change on Migration Phenology of Three Species of North American Raptors

Marliese E.S. Baer (St. Lawrence University, Canton, NY) and Erika L. Barthelmess (St. Lawrence University, Canton, NY)

Abstract - Climate change is a global issue that impacts species worldwide. One way that climate change impacts species is causing shifts in phenology. In birds, even a seemingly small shift in timing can have real implications on nesting success and on the phenological synchrony of predator-prey relationships. We examined the effects of climate change on fall-migration timing of 3 species of North American raptors representing Buteos, Accipiters, and Falcons. We studied the migration phenology of each species in 3 major North American bird-migration flyways. We used long-term datasets managed by Hawk Count that represent migration history dating as far back as 1971. We expected to see a delay in fall-migration timing for all 3 species in all locations.

Sat- 9

Tree Growth, Mortality, and Recruitment in a Mixed Hardwood Forest in the New Jersey Highlands

Niki Bajracharya (Ramapo College of NJ, Mahwah, NJ), **Noah Sgaramella** (Ramapo College of NJ, Mahwah, NJ), and Eric Wiener (Ramapo College of NJ, Mahwah, NJ)

Abstract - Various stressors have been impacting the health and regeneration of numerous tree species in forests throughout much of the northeastern United States. The purpose of this study was to examine recent tree growth, mortality, and recruitment within a 3.6-ha permanent forest plot in a mixed-hardwood forest in the New Jersey Highlands. We recorded species, trunk diameter (dbh), stratum, and GPS coordinates in 2017 and 2023 for all trees ≥ 10 cm dbh. Our results revealed that among the 12 most common species, the abundance of *Fraxinus americana* (White Ash) and *Cornus florida* (Flowering Dogwood) steeply declined, while the abundance of *Acer rubrum* (Red Maple) and all of the *Quercus* (oak) species also declined. In contrast, the abundance of *Acer saccharum* (Sugar Maple), *Betula lenta* (Black Birch), *Sassafras albidum* (Sassafras), *Carya glabra* (Pignut Hickory) and *Fagus grandifolia* (American Beech) increased. Interestingly, growth measured between 2017 and 2023 was statistically consistently lower for most species than in the previous 6 years. The spatial distribution of the 3 most common species revealed a significant positive spatial correlation between Black Birch and Red Maple ($P < 0.001$) and significant negative spatial correlations between each of these 2 species and Sugar Maple ($P < 0.01$), which are likely either due to competition or different niche requirements. Clearly, the tree species composition within our study area is in a highly dynamic state. Future surveys within our permanent forest plot will allow us to continue to monitor the rise and fall of different tree species over time.

Sat- 34

Investigating Helminth Biodiversity in New York State through Mitochondrial Genomics

Allyson G. Barredo (SUNY Purchase, Purchase, NY), Amelia Whitehurst (SUNY Purchase, Purchase, NY), Dr. Stephen Harris (SUNY Purchase, Purchase, NY), and Erika Ebbs (SUNY Purchase, Purchase, NY)

Abstract - Helminths have complex life cycles that rely on multiple hosts which can be taxonomically, geographically, and temporally distinct. These factors present a challenge in understanding the scope of helminth biodiversity. The mitochondrial genome is conserved maternally through generations, and maintains substantial genetic variation. Therefore, it is characterized as a popular and powerful genetic marker to investigate variation, identify species, and determine evolutionary relatedness—ultimately allowing us to draw conclusions on helminth evolution. Mitochondrial genomics also provides a tractable way to engage undergraduate students in an authentic research experience via a Course based Undergraduate Research Experience (CURE). In the Spring of 2023, a 9-week Mitochondrial Genomics CURE was embedded into an upper-level Genetics Laboratory course. As a class, we were given an unknown helminth sample acquired from a *Spatula clypeata* (Northern Shoveler) from upstate New York. We carried out DNA extraction, Oxford Nanopore (ONT) library preparation, and benchtop whole genome sequencing. We generated millions of ONT reads, then extracted, assembled, and annotated mitochondrial genomes. Next, we analyzed and compared the mitochondrial genome to related helminth species. Our results demonstrated that the unknown helminth is a novel species, within the genus *Australapatemon* (Diplostomoidea). To further investigate this novel species, we dissected a cohort of 10 *Anas platyrhynchos* (Mallard) from the same region to obtain more helminths, with the goal to better understand the host-associations and prevalence of this species. Further comparisons between samples collected over the past year will provide further insight into the ecology of upstate New York as well as the life cycle, transmission, and ultimately identity of the helminth from the CURE project.

Sat- 13

A Bog's Life: Comparing Sampling Methods for Assessing Insect Community Composition

Keira Beckford (SUNY Plattsburgh, Plattsburgh, NY), **Stephen Langdon** (Shingle Shanty Preserve and Research Station, Adirondack Park, NY), **Timothy Mihuc** (SUNY Plattsburgh, Plattsburgh, NY), **Michale Glennon** (Adirondack Watershed Institute, Paul Smith's College, NY), and **Mark Lesser** (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Boreal peatlands house multitudes of arthropods varying in size, order, and effect on the ecosystem. Not only do they play an integral role in maintaining the food web by mitigating smaller pests, they participate in decomposition of animal corpses, pollination, and waste reduction. Their sensitivity to changes in the environment makes them important bioindicators of ecosystem health. As such, they may be particularly important in peatlands at their southern range margin in the boreal-temperate ecotone (BTE) where climate change impacts are most notable. However, due to their diversity and especially the variation in sampling techniques, quantifying arthropod communities is burdensome for entomologists. Our goal was to compare different sampling methods in order to determine which method (or combination) best reflects the entire arthropod community. In this study, we collected terrestrial arthropods at the Shingle Shanty Preserve and Research Station, in the Adirondacks of Upstate New York, located at the southern range of the North American BTE. We collected arthropods monthly in 3 peatland sites from June to September in 2023. At each site, we established transects in the forested, transition, and open bog, with 3 plots located along each transect (total of 27 plot locations). Ground vegetation was collected and placed in Berlese funnels to collect ground dwelling arthropods. We performed ground and aerial sweep netting at four 90° angles, 5 m from each plot center. We set Lindgren funnel traps at the middle plot of each transect at each site (totaling 9 traps) and collected arthropods and reset funnels at each monthly collection. Preliminary results show that, of the 130 collected families, 70, 21, 17, and 28 were found in the ground sweep, aerial sweep, berlese funnel, and Lindgren funnel samples, respectively. Interestingly, 47% to 79% of families found in a sampling technique were unique to that method. These results demonstrate that no single sampling method can properly capture the full insect community assemblage; a variety of sampling methods is required to fully understand this extremely important component of these ecosystems.

Sun- 30

Determinants of Forest Health in St. Lawrence County, New York

Olivia H. Bernier (St. Lawrence University, Canton, NY) and **Erika L. Barthelmess** (St. Lawrence University, Canton, NY)

Abstract - Forests are complex ecosystems that provide humans with numerous resources, from timber and clean air to maple syrup. A decline in forest health, stemming from threats such as foreign pests and climate change, could result in the loss of these and other resources. Not only are forests integral to human well-being and the economy, but they provide critical habitat for numerous species. We collected data from 5 forests in St. Lawrence County, NY, with the goal of determining a baseline understanding of forest health. We analyzed the relationship between canopy density and herbaceous ground cover and expected that more-open canopies would be associated with a higher percentage of herbaceous ground cover. We also analyzed the relationship between *Odocoileus virginianus* (White-tailed Deer) density and tree seedling and sapling density and expected a negative relationship between White-tailed Deer density and regeneration density due to browsing pressure.

Sat- 33

Using Remotely Sensed Data to Map Woody Understory for New England Cottontail Conservation

Susan D. Booth-Binczik (New York State Department of Environmental Conservation, New Paltz, NY), **Amy K. Conley** (New York Natural Heritage Program, SUNY College of Environmental Science and Forestry, Albany, NY), and **Timothy G. Howard** (New York Natural Heritage Program, SUNY College of Environmental Science and Forestry, Albany, NY)

Abstract - As part of an investigation of *Sylvilagus transitionalis* (New England Cottontail) distribution and habitat associations in Clarence Fahnestock Memorial State Park, we used LiDAR data and leaf-off aerial imagery to map overall woody understory density and specifically *Kalmia latifolia* (Mountain Laurel) density throughout the park. We created a grid of transects spaced 100 m apart, and a conservation-detection dog team surveyed for New England Cottontail fecal pellets along those transects. The surveyor estimated Mountain Laurel coverage at each transect intersection traversed and woody understory coverage at each spot where fecal pellets were found. We compared the field-cover estimates with the predictions from the remotely sensed data to evaluate the accuracy of the mapping method. We plan to expand the mapping to cover all of New England Cottontail range in New York in order to aid in identifying areas with dense woody understory and Mountain Laurel that may represent current or potential New England Cottontail habitat and be targeted for future field work or landowner outreach.

Sat- 43

Effects of Timber Harvesting Techniques on Amphibian Populations

William T. Brandenburg (University of New Hampshire [UNH], Durham, NH), Joshua Willems (UNH, Durham, NH), and Rebecca J. Rowe (UNH, Durham, NH)

Abstract - Timber harvests function as disturbances that may affect habitat suitability for species in forest ecosystems. We investigated the effects of different timber-harvesting techniques on 3 amphibian species: *Bufo americanus* (American Toad), *Plethodon cinereus* (Red-backed Salamander), and *Rana sylvatica* (Wood Frog). Every summer since 1994, pitfall traps were placed at 9 sites in the Bartlett Experimental Forest in the White Mountains of New Hampshire; each site was subjected to a different method of timber harvest (clearcut, single-tree selection, shelterwood, group cut, and patch cut; 1 of the sites also experienced an ice storm) with 1 of the sites serving as an unharvested control site. We then compared the counts of the target species at each site against different aspects of forest structure and weather. One of these factors, mean herbaceous cover, had a negative effect on the American Toad counts, but a positive effect on the Red-backed Salamander and Wood Frog counts, according to our preliminary results. As amphibians are particularly sensitive to environmental change, these data could reveal how timber harvests affect forest ecosystems as a whole and should be used to inform silvicultural practices.

Sat- 28

Predicting Amphibian Road Crossing Hotspots in Eastern New York

Andrew Brunner (Siena College, Department of Environmental Studies and Sciences, Loudonville, NY) and Mary Beth Kolozsvary (Department of Environmental Studies and Sciences, Siena College, Loudonville, NY)

Abstract - Mortality from vehicular traffic is a major threat to wildlife in developed regions worldwide. In the Northeast, early spring pond-breeding amphibians undergo mass migrations from overwintering sites to breeding ponds, crossing roads in large numbers at night, making them susceptible to road mortality. Several of these species are of conservation concern, and there is great interest in preventing mortality during spring breeding migration events. In many localities, networks of volunteers organize to assist migrating amphibians cross the road safely. However, in many areas, the locations of these crossings are not well known. To address this outstanding need, we used ArcGIS (datalayers: forest, roads, vernal pools) to determine potential crossing hotspots in Albany and Rensselaer counties, NY. We identified sections of roads close to vernal pools and surrounded by forest. We field-validated the model by randomly selecting a subset of 5 road sections near Schodack, NY. We conducted surveys at the 5 sites on 6 evenings during ideal weather conditions: warm, rainy nights in early spring. Surveys involved walking a 0.24-km (0.15-mi) length of road, twice, for a 0.48-km (0.3-mi) survey, while tallying the number of live and dead amphibians, by species. We observed amphibians crossing at 4 of the 5 survey locations, documenting 3 species: *Ambystoma maculatum* (Spotted Salamander), *Lithobates sylvaticus* (Wood Frog), and *Pseudacris crucifer* (Spring Peeper). These results provide support for our initial GIS model. Ultimately, information will be shared with local volunteer groups that may be interested in “adopting” these amphibian road-crossing hotspots.

Sun- 23

Investigating Courtship, Display Behaviors, and Personality of Ant-Mimicking Spiders

Madison Bulkley (SUNY Geneseo, Geneseo, NY), **Hannah Reid** (SUNY Geneseo, Geneseo, NY), and Jennifer L. Apple (SUNY Geneseo, Geneseo, NY)

Abstract - The ant-mimicking spider *Myrmarachne formicaria*, is a jumping spider (Salticidae) that recently arrived in North America from its native range in Eurasia. They mimic ants in appearance as well as with behaviors like moving their 2 front legs to imitate antennae. The goal of this study is to determine if these spiders exhibit consistent behavioral traits that can be identified as personality, such as variation in degrees of boldness or aggression, and if this personality relates to male display behavior and their success in courting females. Many jumping spider species exhibit complex courtship displays to attract mates. When 2 *M. formicaria* males encounter each other, they display by moving side-to-side while facing each other. It seems that when the spider is trying to be more aggressive, it spreads open its enlarged chelicerae or raises its front legs. Often this display ends with one of the spiders retreating while the other claims the new territory. We seek to determine if personality differences govern which spiders win in these duels. The spiders' behavior was assessed through a mirror assay, in which a spider was released into a runway with a mirror at the end, and observed for 5 minutes. We measured the duration of time the male displayed toward the mirror, and repeated the assay at least twice for each spider. In the field, males often establish shelters next to those of conspecifics which may not yet have reached maturity. Taking interest in whether males could distinguish between empty shelters belonging to males vs. females, we conducted experiments where males were placed in cages with an empty shelter and observed for 30 minutes. Preliminary data shows males interacting with the shelter, entering it in some cases or completely ignoring shelters in others, but neither interaction seems to be specific to whether the shelter belongs to a male or female spider. This work will help understand factors affecting male-male interactions and success in securing mating opportunities. This study helps improve our understanding of the mating behavior of this species as well as the role of personality in its interactions.

Sun- 37

Diversity of Bees in Trees and Their Foraging Preferences on an Urban College Campus

Aidan Castricone (Providence College, Providence, RI) and Rachael Bonoan (Providence College, Providence, RI)

Abstract - It is well known that insect-pollinator populations are declining and a lack of nutrients (i.e., flowering plants) may be a contributor to this decline. Insect pollinators forage for pollen and nectar, which provide proteins, fats, and carbohydrates, from flowering plants. Trees such as *Acer rubrum* (Red Maple) and *Malus* sp. (crabapple) bloom early in the spring, before any of the perennials and forbs. Thus, trees are likely one of the only places that early emerging bees can find food. Past research has shown that during the seasonal transition from spring to summer, when more food becomes available, bees became more generalized in their pollen foraging. On Providence College campus, I studied bees foraging in trees using 2 different sampling methods: bee cups strung up via a pulley system and sweep netting. I had 2 waves of samplings in pollinator-friendly trees (17 trees during spring, 13 trees during summer) over 2 field seasons. Each tree had bee cups strung up in the canopy and we collected the contents each week. We pinned collected bees and identified them to genus and when possible, species. We studied their pollen-foraging preferences using microscopy. We sweep-netted bees and collected pollen using fuschin jelly and analyzed under a microscope. Pinned specimens will contribute to the Providence Pollinators reference collection and inform on-campus tree management for pollinator conservation.

Sun- 34

A Newly Identified Plant Community on Pennsylvania's Seepy Cliffs

Claire M. Ciafré (PA Natural Heritage Program, Harrisburg, PA), Mary Ann Furedi (PA Natural Heritage Program, Harrisburg, PA), Ephraim Zimmerman (PA Natural Heritage Program, Pittsburgh, PA), Jaci Braund (PA Natural Heritage Program, Harrisburg, PA), S. Schuette (PA Natural Heritage Program, Pittsburgh, PA), and G. Podniesinski (PA Natural Heritage Program, Harrisburg, PA)

Abstract - We collected plant-community data, including site descriptions and plot data, from 42 seepage wetlands in Pennsylvania. We classified plots using hierarchical cluster analysis, ordination, and site descriptions. We then compared the results with vegetation types already included in Pennsylvania's community classification and the US National Vegetation Classification (NVC). We identified 4 distinct herbaceous community types, and a new type, provisionally named "vertical seep," is proposed. This type, which is found where perennial seepage occurs on non-calcareous vertical rock exposures, does not appear to be similar to existing associations within the NVC.

Sun- 29

Survey of Freshwater Turtles in Salmon Brook, Nashua, New Hampshire

Danielle Clement (Rivier University, Nashua, NH), **Jeremy Fontaine** (Boston, MA), and **Shanna Demers** (Rivier University, Nashua, NH)

Abstract - New Hampshire is home to 8 species of freshwater turtles, including an introduced species, *Trachemys scripta elegans* (Red-eared Slider). Literature on freshwater turtle populations and ranges throughout New England is not as complete as in other parts of the country. Here, we provide population parameters for 3 native species of freshwater turtles, *Sternotherus odoratus* (Common Musk Turtle), *Chelydra serpentina* (Snapping Turtle), and *Chrysemys picta* (Eastern Painted Turtle), that we captured using hand and baited-hoop nets over 3 years from 2021 to 2023. Excluding recaptures, we obtained biometric data, including carapace and plastron length and width, mass, and visual sex on 404 *C. picta*, 19 *S. odoratus*, 21 *C. serpentina*, 2 *T. scripta elegans*, and 1 state-endangered *Emydoidea blandingii* (Blanding's Turtle). We set traps at 3 locations throughout a small river tributary, Salmon Brook, in southern Nashua, NH, during May and July 2021, April 2022, and May and September 2023. This survey established prevalent species found in the Salmon Brook tributary. It will be used as baseline information for a longer-term population study assessing spatial and temporal variation in these species.

Sat- 23

Seasonal Shifts in the Physiology of Wood Ferns

Porter Comstock (Colgate University, Hamilton, NY), **Matt Leopold** (Colgate University, Hamilton, NY), and **James E. Watkins, Jr.** (Colgate University, Hamilton, NY)

Abstract - The wood fern genus *Dryopteris* plays an important role in NE temperate forests. Previous work has shown that species in the genus can exert significant bottom-up control of seed germination and directly influence forest regeneration. Some *Dryopteris* can become dominant members of forested wetlands and swamps where they may play important roles in ecosystem function. The genus is well known for its promiscuous behavior with most all taxa involved in the formation of multiple hybrids. These hybrids can become numerous and equal the proportion of their parents in some New York forests. While their ecological roles are somewhat understood, significantly less is known about *Dryopteris* physiology, especially how it changes over the growing season. The goal of this work was to examine seasonal shifts in the physiology of 2 species and their respective hybrid across a forest-wetland gradient. Here we compare the physiology of *Dryopteris xboottii* (Bootts' Wood Fern), a sterile triploid hybrid that is common in forested wetlands to its parents: *Dryopteris cristata* (Crested Wood Fern), a tetraploid wetland endemic, and *Dryopteris intermedia* (Intermediate Wood Fern), a diploid widespread forest-wetland taxon. We took measurements at 3 time periods: early, mid-, and later growing season and compared photosynthetic rates and several functional traits across these 3 time periods. We found that species were indistinguishable during early season growth, but became more distinct in mid- and late season measurements. The triploid *D. xboottii* was more similar to its tetraploid parent *D. cristata*, but *D. xboottii* maintained the highest rate of photosynthesis throughout both growing seasons and changed more over the season than its parental taxa. *Dryopteris intermedia* experienced an uptick in its photosynthetic mean rates, but the increase was not as large as that observed in the other 2 species. A similar pattern was recorded in several functional traits. These findings suggest that hybrid and tetraploid ferns may demonstrate greater plasticity compared to diploid species. While potentially important for competition in some habitats, such plasticity may not result in an increasing niche space as the diploid *D. intermedia* is one of the most widespread ferns in New York.

Sun- 28

The Effects of Manual Cutting on *Typha* Inflorescence Production in a Central New York Fen

Nathan Crego (SUNY Oswego, Oswego, NY) and **C. Eric Hellquist** (SUNY Oswego, Oswego, NY)

Abstract - *Typha* (cattails) are obligate wetland plants found in a wide range of wetland habitats. *Typha* can reproduce prolifically and can expand over large areas in the absence of management. We worked in a central New York fen where *Typha* have become dominant. The spread of *Typha* has jeopardized the habitat integrity and species composition of the fen. In order to preserve the sensitive fen habitat, we used manual cutting over 6 field seasons to control *Typha* growth and reproduction. One of our objectives was to control the production of inflorescences and eventual seed set in *Typha*. We cut *Typha* stems in the spring and fall to determine which season would have a greater impact on inflorescence production. In the first 5 years during spring, cutting was done before inflorescences were able to emerge. In the first 5 years of fall cutting, there was a 96% reduction in inflorescences when cut. There was a 98% reduction in inflorescence when 2016 plots were compared to the uncut plots in 2020. After a 2-season hiatus in cutting, inflorescences were still reduced. From fall 2020 to fall 2023 there was a 5x reduction in inflorescences. When uncut plots in 2023 were compared to plots cut in the fall 2023, there were 19x more flowering stems in plots left uncut. As shown by comparisons of spring, fall, and uncut data, there is a clear advantage to manual control in the spring. Spring cutting prevents inflorescence formation, and thus decreases opportunities for reproduction and dispersal.

Sat- 17

The Influence of Private Septic Systems on Water Quality in a Suburban Watershed

Samantha Cronk (Pace University, Pleasantville, NY) and **Mike Rubbo** (Pace University, Pleasantville, NY)

Abstract - Private septic systems can have adverse effects on the health of aquatic ecosystems. Recognizing the influence of septic systems on water quality is important because it demonstrates the significance of proper design, installation, and maintenance of these systems. To better understand the influence of these systems on water quality, we conducted a study of the Pocantico River, which flows through a suburban watershed in Westchester County, NY. We analyzed the relationship between the river's water quality and the presence of private septic systems. We chose 7 sampling locations along the river for biweekly testing of various water-quality parameters including sewage-indicators such as nitrate, phosphate, and enterococci bacteria. Using data from Westchester County, we determined the number of properties using septic systems within the Pocantico's watershed and within the estimated watershed of each sampling point. Initial data analysis has shown variations in the water-quality parameters between the different sampling points based upon their locations in the watershed. We are currently working to determine the effects of septic-density on these parameters. These data can be used to help design mitigation strategies for septic systems to improve water quality.

Sat- 24

Invasion of the Waterfleas and Their Impact on the Zooplankton of Lake Champlain

Zachary Cutter (SUNY Plattsburgh, Plattsburgh, NY), **Tim Mihuc** (SUNY Plattsburgh, Plattsburgh, NY), and **Luke Myers** (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - This poster will explore the importance of zooplankton to lake ecosystems such as Lake Champlain, and the cascade effect on the food web brought about by invasive species. The zooplankton community of Lake Champlain has been altered over the past decade due to the introduction of 2 predatory zooplankton species, *Bythotrephes longimanus* (Spiny Waterflea), invading in August of 2014, and *Cercopagis pengoi* (Fishhook Waterflea), first appearing in August of 2018. Continuous sampling through the 2010s has found that many key species have been impacted by both invaders. The most apparent change is the reduction of the copepod *Diacyclops thomasi* by both invaders and a reduction in the daphnia *Daphnia retrocurva* following the introduction of *B. longimanus*. Both species are common throughout the lake and thus are an important food source for many organisms. Other cyclopoids, bosminids, and rotifers were also reduced corresponding to the introduction of both waterfleas. The 2 invaders are unable to coexist with each other or the native predator *Leptodora kindtii*, displaying seasonal partitioning between their populations. In summary, these findings suggest that the invasion of both *B. longimanus* and *C. pengoi* in Lake Champlain have impacted the pelagic zooplankton community structure. Some changes appear to be short-term responses, while others may result in long-term shifts in community structure.

Sun- 17

Demographic and Phenological Changes in a Vermont Passerine Community Subject to a Warming Climate

Charlie Merlin Darmstadt (Wheaton College, Norton, MA)

Abstract - As climate-change-driven warming increases breeding-season temperatures, the breeding distributions of many migratory passerines creep further and further north each year. The contribution of climate change to the alteration and degradation of habitats also decreases migratory success, often leading to lower rates of survivorship for bird populations. I analyzed 10 years of bird-banding data collected under the MAPS (Monitoring Avian Productivity and Survivorship) banding protocol at a station in central Vermont. I hypothesized that the communities' species richness would remain constant over time, but that the community composition and relative abundances of different species would change. Additionally, I hypothesized that the onset of breeding would occur earlier each year and that productivity and survivorship, for all species, would decrease over time. I found that species richness and community composition did not change over the 10-year study period. Capture-mark-recapture modeling did not show a change in survivorship for any of 7 focal species, but did reveal that 3 of the 7 species had survival probabilities (ϕ) lower than the values given in the Vital Rates of North American Landbirds database, which compiles all MAPS data. Those species were *Geothlypis trichas* (Common Yellowthroat), *Melospiza melodia* (Song Sparrow), and *Empidonax alnorum/traillii* (Traill's Flycatcher). I will also present data on the productivity and phenology of breeding of the 7 focal species. This study gives insights into avian conservation needs in New England, as it is important to know how climate change affects breeding birds not only at large scales but also at the scale of small populations and communities.

Sat- 8

Long-term Effects of the Asian Shore Crab on the Rocky Intertidal Community at Sandwich, Massachusetts

Myra M. Dehestani (Bridgewater State University, Bridgewater, MA), Kimberly M. Waller (Bridgewater State University, Bridgewater, MA), Mallory J. Morrison (Bridgewater State University, Bridgewater, MA), and Christopher P. Bloch (Bridgewater State University, Bridgewater, MA)

Abstract - *Hemigrapsus sanguineus* (Asian Shore Crab), native to East Asia, was first observed in North America in the late 1980s at Cape May, NJ, and subsequently invaded rocky shores throughout the Atlantic coast. It has negatively impacted local species through the consumption of large amounts of prey and competition for resources, which in turn has disrupted community structure. Since 2003, we have monitored long-term population dynamics of the Asian Shore Crab and associated species in a rocky intertidal habitat at Sandwich, MA, on the northern coast of Cape Cod. Over the past 20 years, the Asian Shore Crab population appears to have experienced boom-bust dynamics. From 2003 to 2012, population density of the Asian Shore Crab increased, while densities of *Carcinus maenas* (Green Crab) and *Mytilus edulis* (Blue Mussel) declined. Following 2012, density of Asian Shore Crabs decreased substantially. From 2015 to 2023, the Asian Shore Crab population averaged ~ 11 individuals/m², roughly one third of its peak density. Density of the Green Crab has remained low. The Blue Mussel population appears to have been generally increasing since the decline of the Asian Shore Crab, but further research is needed to account for substantial temporal variability. *Littorina littorea* (Common Periwinkle) exhibited no significant temporal trend during this time. These results suggest that if densities of the Asian Shore Crab remain low, populations of some prey species may recover from depletion by the invading predator. Continued long-term monitoring of population trends at Sandwich will further elucidate effects of the Asian Shore Crab on local species, providing knowledge that can then be applied toward managing the invasive species and its impacts.

Sun- 44

Effects of Human-driven Landscape Alteration on Small Mammal Biodiversity

Maggie Denison (College of the Atlantic, Bar Harbor, ME), Thomas Bates (Trinity University, San Antonio, TX), Ellie Jackson (College of the Atlantic, Bar Harbor, ME), and Brittany L. Slabach (Trinity University, San Antonio, TX)

Abstract - Small mammals are ecologically important; they disperse seeds and fungal spores, contribute to nutrient cycling, and are a prey source for many other species. We investigated the relationship between historical human-driven landscape alteration (e.g., logging) and small-mammal biodiversity on Schoodic Peninsula, Acadia National Park, ME. Using standard live-trapping and mark-recapture methods, we assessed diversity and distribution of small mammals across habitat types and gradients of disturbance. Over 1481 trap nights, we captured 58 unique individuals representing 6 species with a recapture rate of 37.4% (40/107). Preliminary results show that overall species diversity and number of unique captures was higher at disturbed sites. Captures of *Peromyscus* (deer mice) species exceeded those of *Myodes gapperi* (Southern Red-backed Vole) at disturbed sites, while the opposite was true for undisturbed sites. Preliminary results from habitat sampling indicate variation in vegetative cover and forest structure between sites that may influence small-mammal assemblages ($W\text{-stat} = 7634$, $n_{\text{dist}} = 165$, $n_{\text{undis}} = 110$, $\text{median}_{\text{dist}} = 0.12$ m, $\text{median}_{\text{undis}} = 0.22$ m, $P = 0.03$). Understanding how historical land use affects current mammalian diversity is critical for making informed management decisions and protecting species and habitats into the future.

Sat- 26

Soil-Surface Invertebrates Across Different Planting Choices on Purchase College Campus

Samantha DeTurris (Purchase College SUNY, Purchase, NY) and Allyson Jackson (Purchase College SUNY, Purchase, NY)

Abstract - Many ecologists have brought attention to the fact that native plants are better for biodiversity than non-native plants. We were interested in exploring how choice of planting could impact soil invertebrates. At Purchase College, SUNY (Westchester County, NY), there is a native plant garden along with ornamental non-native plantings and lawn. We selected 7 native flower plots, 3 ornamental plots, and 3 lawn plots. We standardized plots for size (1.8 m x 0.6 m [6 ft x 2 ft]) and then installed 3 pitfall traps per site. Traps collected ground invertebrates for 24 hours over 2 separate sampling dates in September 2023. In the lab, we identified all invertebrates using a dissecting microscope and iNaturalist. We compared both number of invertebrates collected and Shannon diversity among planting choices. This is an important topic because today there are many plant choices that one can make when landscaping. As native plant gardens become more popular, it is interesting to investigate if they do promote insect biodiversity as much as ecologists claim. A well-informed decision in planting choice concerned with insect biodiversity will benefit the ecosystem and help combat the loss of biodiversity experienced in the Anthropocene.

Sun- 38

The Effects of *Robinia pseudoacacia* Removal on Soil Nutrient Concentrations in the Albany Pine Bush

Johanna DiCerbo (Albany, NY)

Abstract - Efforts to restore native biodiversity often include the removal of invasive species. However, the process of removing unwanted species can have unintended effects. I studied how the removal of 1 exotic species, *Robinia pseudoacacia* (Black Locust), during efforts to restore native pine-barren ecosystems at the Albany Pine Bush Preserve, may affect soil conditions. I hypothesized that before restoration, the top layers of soil would have a lot of nutrients that would gradually decrease with increasing depth, and that after restoration there would be a uniform spread of nutrients throughout the soil profile due to soil mixing during tree removal. I collected 5 sequential soil-core samples from the Albany Pine Bush in 6 different locations within the same Black Locust forest. I did this both before and after tree removal and analyzed the samples for soil carbon and nitrogen content. I found that the soil samples before restoration had higher concentrations of carbon and nitrogen in the top layer of soil compared to the deeper layers, whereas there were no significant differences in the amount of nutrients in the different layers of soil after restoration. With further analysis, I also discovered that the shallower depths were losing nutrients while the deeper depths were gaining nutrients by using delta values for both carbon and nitrogen content before and after restoration. These results indicate that tree removal has the unintended consequence of altering soil chemistry. The alteration in soil chemistry could slow recovery of native species following tree removal, so restoration methods that minimize soil disturbances should be pursued.

Sun- 6

Below the Tide: Winter Diving Behaviors of the Common Loon

Will L. Draxler (College of the Atlantic, Bar Harbor, ME) and Autumn L. Pauly (College of the Atlantic, Bar Harbor, ME)

Abstract - *Gavia immer* (Common Loon) has been used as an indicator of water quality and various environmental conditions, particularly in freshwater lakes. Studies conducted during their breeding season on freshwater lakes have shown that various water characteristics can influence the foraging behavior of *G. immer*. There has been a lack of research investigating this relationship during their non-breeding season, which is largely spent in saltwater ecosystems during the winter months. This study aims to determine whether there is a correlation between various tidal heights and the duration of dive times and distribution of *G. immer*. We conducted regular observations of temporal dive length at several distinct coastal sites on Mount Desert Island, Hancock County, ME, as a continuation of studies conducted in 2010 and 2023. We will be presenting our findings on the relationship between water conditions and foraging behavior, the spatial distribution of individuals during various tidal stages, and what implications our findings have for future research endeavors and conservation efforts.

Sat- 4

Hemlock Woolly Adelgid Populations and Eastern Hemlock Health Follow a Four-Year Cycle in South Central Pennsylvania

Jack C. Drda (Dickinson College, Carlisle, PA), Halle Maeda (Dickinson College, Carlisle, PA), Claudia Maira (Dickinson College, Carlisle, PA), and Tina Semevolos (Dickinson College, Carlisle, PA)

Abstract - *Tsuga canadensis* (Eastern Hemlock) is a valuable foundation tree species that provides shade for streams and year-round habitat for forest animals. However, this tree is threatened by the invasive *Adelges tsugae* (Hemlock Woolly Adelgid [HWA]) that feeds from the base of the tree's needles. HWA presence in Eastern Hemlock stands causes defoliation, and tree mortality has frequently been described within 4 years following infestation. Annually since 2014, the Loeffler Lab surveyed 8 pairs of high- and low-elevation sites to measure HWA presence as well as new growth and foliage density of Eastern Hemlocks to assess tree health. HWA abundance rose and fell on a 4-year cycle, peaking in 2017 and 2021. HWA abundance was greater at the high-elevation sites in all years compared to the low sites. In most years, new growth was also greater at high-elevation sites. Strong new-growth years seemed to precede a peak in HWA abundance the following year. After this peak, the Eastern Hemlock populations experienced sharp declines in both new growth and adelgid population the following year. Despite this decline, however, new growth recovered and restarted a new 4-year cycle. Because the HWA favors new growth but has a toxic effect on the Eastern Hemlock, this cycle may be self-perpetuating. These insights provide a mutual cycling interaction where the Eastern Hemlock's health modulates HWA presence and vice-versa. This cycling interaction may also be influenced by severely low temperatures, such as an event that occurred in January 2018. HWA population cycling in other Northeastern forests remains unexplored and an exciting area for future study that may lend insight into HWA-mitigation efforts.

Sat- 31

Examining Drivers of Skull Size and Shape Variance within the Genus *Didelphis* using 3D Morphometrics

Lily Duerr (University of Vermont, Burlington, VT) and Sara Helms Cahan (University of Vermont, Burlington, VT)

Abstract - In this study, we employed 3D morphometric technology to investigate the various factors influencing cranial size and shape variation within the opossum genus *Didelphis*. Data acquisition involved scanning specimens on-site at the Royal Ontario Museum, the University of Michigan Ann Arbor's collections, and the Smithsonian, alongside specimens from the University of Vermont's own museum. Our investigation examined the relationships of size and shape variance with factors such as sympatry and allopatry, sex, allometry, age classes, and clinal variation. This analysis was facilitated by the use of software packages MorphoJ and R, with Mesquite employed for phylogenetic analyses. Data analysis is currently ongoing, and we will present our results and interpretations.

Sat- 45

Stream Recovery and Aquatic Plant Growth: Above, Below, and In Town

Lucy Earl (Dickinson College, Carlisle, PA)

Abstract - Aquatic vegetation serves as an important indicator of stream health, habitat conditions, and broader ecosystem processes. Studies of spring-fed streams near Carlisle, PA, have suggested that aquatic vegetation can be abundant above an urban area, but disappear within the urban area to appear downstream of the town. I observed 4 additional streams in Cumberland County, PA, and verified that there is a pattern of stream recovery and a spatial relationship between aquatic plants and anthropogenic factors. With this information, I am seeking to examine what possible anthropogenic or natural factors could cause this disappearance and what conditions aid in the recovery of aquatic vegetation downstream. I have verified in late-winter measurements (January–February 2024) that even though all the streams are spring-fed, temperatures vary little along the length of these streams, so at this point, the vegetation pattern is not affected by changes in temperature. Thus, I am investigating additional conditions. The results will be presented on the poster and will include water testing, further quantification of stream plant makeup, temperature, and any other determining factors I observe. I hope to conclude with some insights into this phenomenon and provide an additional holistic view of Cumberland County streams. Through this process of discovery, I seek to understand what possible anthropogenic or natural influences have limited vegetation growth and allowed them to recover.

Sat- 21

Pilot Study of Mercury in Dragonflies in Black Rock Forest, NY

Jaclyn Feehan (Purchase College, Purchase, NY) and Allyson Jackson (Purchase College, Purchase, NY)

Abstract - Mercury (Hg) is a neurotoxin found in aquatic systems worldwide. Dragonfly larvae are often used to assess potential environmental health risks due to mercury because they are easy to sample and often correlate to fish Hg exposure. This study investigates mercury levels in larval dragonflies from 4 different wetlands in Black Rock Forest (Cornwall, NY), including Jim's Pond ($n = 6$), Sutherland Pond ($n = 4$), Aleck Meadow ($n = 3$), and Sphagnum Bog ($n = 3$). Jim's Pond and Sutherland Pond were sampled on 6 July 2023 and 9 September 2023 while Aleck Meadow and Sphagnum Bog were only sampled on 9 September 2023. In the lab, we identified and grouped dragonflies by family (Aeshnidae, Corduliidae, Libellulidae, and Macromiidae) before being testing them for Hg (min–max = 1.54 to 6.15 ng and min–max = 81.88 to 258.52 ppb, dry weight). At each of these sites and sampling dates, we also collected other members of the aquatic invertebrate community, including *Tetragnatha* (long-jawed orbweavers), *Ranatra* (water scorpions), *Dolomedes triton* (Six-Spotted Fishing Spider), *Hesperocorixa* sp. (a water boatman in family Corixidae), *Mesovelia mulsanti* (Mulsant's Water Treader), the backswimmer *Buenoa* sp., *Gyrinus* (whirligig beetles), and the predaceous diving beetles *Laccophilus* and *Neoporus*. Our goal is to compare Hg concentrations in larval dragonflies among the sites and see how the overall invertebrate community could impact Hg bioaccumulation. This area has relatively little research on Hg cycling, and this pilot study helps us understand which water bodies may be at highest risk to Hg.

Sun- 32

Goat Grazing and Repeated Cutting of *Reynoutria japonica*, s.l., (Japanese Knotweed) Diversifies Flora

Richard S. Feldman (Marist College, Poughkeepsie, NY), Radka Wildova (Ecological Research Institute, New Paltz, NY), Emily Zheng (Marist College, Poughkeepsie, NY), James Helmreich (Marist College, Poughkeepsie, NY)

Abstract - We controlled *Reynoutria japonica*, s.l., (Japanese Knotweed) via goat grazing and then repeated cutting on 0.53 ha for 6 years prior to measuring vegetation recovery in 2019. We continued cutting for another 4 years and conducted another vegetation survey in 2023. What plant species would colonize after suppression of the prior Japanese Knotweed monoculture? Did colonization change over 4 years? How would species distributions relate to each other and to soil and light conditions? We recorded species identity and cover, several soil parameters and photosynthetically active radiation (PAR) along a 95-m transect. Japanese Knotweed remained common, but its biomass declined dramatically across the site, allowing 55 other plant species to colonize in 2019 and 69 in 2023, a 25% increase. Both native species and non-native species other than Japanese Knotweed colonized the treated area. Japanese Knotweed cover was positively correlated with percent clay and available water capacity, indicating that success of Japanese Knotweed control depends on environmental conditions. Multiple regression for 2023 data revealed 40% of species exhibited weak to strong correlations with soil texture, soil moisture, pH, and PAR, individually or in various combinations. We used detrended correspondence analysis (DCA) to explore distributions of newly established species across environmental gradients. Percent bare soil in sampling quadrats and percent clay were significantly ($P < 0.05$) correlated with species distribution. Species assemblages reflected differences in soil texture and soil moisture, with a pattern of non-native species occupying areas of shallow soil, in contrast to native species that were more prevalent in deeper soil. Additional relationships are expected to be revealed by ongoing analyses.

Sun- 13

Mussels of Onondaga Lake

Erin Foley (NYS Department of Environmental Conservation, Albany, NY)

Abstract - Known as “the most polluted lake in the US”, Onondaga Lake has a lengthy history of contamination from industrial and municipal pollution, with the contaminants of concern listed as mercury, PCBs, dioxin, and more. In 2020, a NYS species of greatest conservation need, tentatively identified as *Utterbackia imbecillis* (Paper Pondshell), was found. A mussel survey was conducted by the New York State Department of Environmental Conservation, with the help of the New York State Museum malacologist in July of 2023 to confirm species presence. As part of a team, I surveyed 6 areas of interest along the south and southwestern shoreline of the lake using tactile and visual methods according to the NYSDEC Freshwater Mussel Survey Guidelines 2021. Our results from this survey indicate improvements to the ecosystems in and around Onondaga Lake post-remediation and restoration.

Sun- 19

Dispersal and Distribution of Jumping Worm species on Sloped, Woodland Landscapes

Kyleigh M. Frank (Colgate University, Hamilton, NY) and **Timothy S. McCay** (Colgate University, Hamilton, NY)

Abstract - Asian jumping worms are quickly expanding their range and rapidly altering fundamental aspects of woodland landscapes. While researchers have documented general information about their spread, the existing literature lacks thorough investigation into species-specific dispersal and distribution strategies. I conducted a recapture project with 3 jumping worm species, *Amyntas agrestis* (Rustic Jumping Worm), *A. tokioensis* (Compact Jumping Worm), and *Metaphire hilgendorfi* (Large Jumping Worm), using coded wire tags in sloped, forested sites at Colgate University (Hamilton, NY) over the course of 16 days. I additionally set up a 3-day microcosm experiment to directly investigate worm dispersal and response to altered gradients. Both studies revealed a positive correlation between time and distance traveled by each species. The findings also suggested species-specific differences, where *M. hilgendorfi* traveled the furthest distance, followed by *A. agrestis*, then *A. tokioensis*. Incline did not have a discernable effect on the distribution or dispersal of individual species in either the lab or field setting. These results provide insight into the capacity of different jumping worm species to disperse within a short period of time, which may have negative implications due to their likely further encroachment into hilly, woodland regions.

Sun- 11

Species Composition of Trees Most Likely to Replace White Ash Canopy Trees in the Ramapo Mountains

Aleah Germinario (Ramapo College of NJ, Mahwah, NJ), **Kyle Sheldon** (Ramapo College of NJ, Mahwah, NJ), and **Eric Wiener** (Ramapo College of NJ, Mahwah, NJ)

Abstract - *Agrilus planipennis* (Emerald Ash Borer) is causing *Fraxinus americana* (White Ash) tree populations to rapidly decline throughout much of the northeastern United States. The purpose of this study was to predict which tree species will most likely replace dead *F. americana* canopy trees within a 30-ha forest study plot in the Ramapo Mountains (New Jersey Highlands). For all patches ($n = 26$) of 2 or more neighboring, canopy *F. americana* trees, we recorded the species and trunk diameter of all subcanopy and midstory trees that were beneath or within 5 m of the edge of *F. americana* canopy. Our preliminary results reveal that among the 900 possible replacement trees, the number of individuals and the relative basal area of *Acer saccharum* (Sugar Maple) are by far the highest, followed by *Acer rubrum* (Red Maple), *Betula lenta* (Black Birch) and 16 other tree species. These results raise concern because populations of at least 2 of the tree species that are most likely to replace *F. americana* in the short to medium term are expected to eventually decline due to climate change.

Sat- 35

Developing a Tree-Ring Fire History for the Albany Pine Bush Preserve, Albany, New York

Aiden Riley Day Gifford (Plymouth State University, Plymouth, NH) and Christopher H Guiterman (University of Colorado Boulder, Boulder, CO, and NOAA's NCEI, Etna, NH)

Abstract - The Albany Pine Bush Preserve in Albany, NY, is an exemplar of ecosystem restoration for the benefit of endangered species, such as *Plebejus melissa samuelis* (Karner Blue Butterfly). A key management tool for the 1379-ha (3407-ac) preserve is prescribed fire. Fire management has been largely experimental, utilizing observations of the responses of key species such as *Pinus rigida* (Pitch Pine), *Quercus ilicifolia* (Bear Oak), and *Quercus prinoides* (Chinkapin Oak) in the Pitch Pine–Scrub Oak Barrens because of the lack of reference sites, Traditional Indigenous Knowledge, and historical fire data. Recent mechanical treatments in one area of the Preserve revealed several fire-scarred Pitch Pines in which the marks of multiple fires from heretofore unknown years were preserved in the growth rings. We were provided sections of these stumps to dendrochronologically analyze, initiating the construction of a tree-ring fire history for the Preserve that will hopefully reveal many aspects of its historical fire regime.

Sat- 39

Hitting The Dusty Trail: Assessing Hiking Trail Erosion in the Adirondack Mountains

Christien Gilman (SUNY Plattsburgh, Plattsburgh, NY) and Timothy Mihuc (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - While considerable research exists investigating the process of soil erosion in agricultural systems, comparatively little has been done to assess the magnitude of erosion on hiking trails. As recreational activities like hiking become more popular, research into the ecological effects of trail usage and construction are becoming more imperative. The region of the Adirondacks has yet to be an area of focus in this regard. The Adirondack Park situated in the northern reaches of New York contains an extensive network of recreational hiking trails stretching more than 3219 km (2000 mi) and constitutes an ideal study area. The objectives of this study were to understand how soil erosion rates were affected by differences in (1) trail slope alignment, (2) trail grade, and (3) trail width as well as to quantify the magnitude of soil loss. In the summer of 2023, we conducted trail assessments of the 3.9-km (2.4-mi) Mt. Jo Loop Trail situated in the High Peaks Wilderness Area near Lake Placid, NY. We established transects every 50 m and took vertical measurements every 20 cm along the trail's width in addition to recording slope alignment and grade. Through our analysis we found a total loss of 37,724 cm² of soil for the entire loop with an average loss of 685.8 cm² per transect. Average trail alignment, grade, and width were determined to be 63.5°, 9.5° and 2.2 m respectively. Additionally, transects that displayed steeper grades and lower degrees of trail alignment were found to correlate with greater amounts of soil loss. However, these results do not appear to be significant. Our results demonstrate that a considerable amount of soil has already been lost from the Mt. Jo Loop Trail and suggest the potential for such erosion to continue. We recommend that further research be conducted in the Adirondacks to better quantify the extent that recreational hiking trails are contributing to overall soil erosion. Such work will better inform trail construction and management within the park moving forward.

Sat- 25

Evaluating Spongy Moth (*Lymantria dispar*) Egg Mass Density in Peebles Island State Park

Logan Gould (Siena College, Department of Environmental Studies and Sciences, Loudonville, NY), **Andrew Damon** (New York State Parks Office of Parks, Recreation, and Historic Preservation, Saratoga Springs, NY), and **Mary Beth Kolozsvary** (Siena College, Department of Environmental Studies and Sciences, Loudonville, NY)

Abstract - *Lymantria dispar* (Spongy Moth) is a non-native, widespread insect pest found throughout forests of the northeastern United States. Native to Europe, Spongy Moths were brought to North America in the late 1800s for silk production but escaped from captivity and have been heavily destructive to native forested ecosystems ever since. Spongy Moth larvae feed on the leaves of trees in spring and can be incredibly destructive to trees, resulting in tree defoliation and in some cases, leading to tree mortality. Spongy Moth populations undergo population cycles (~10–15-year cycles), but their numbers and the amount of destruction vary from year to year. Peebles Island State Park in Cohoes, NY, began to see an increase in Spongy Moth activity in 2020, with defoliation events impacting trees in various locations of the park. New York State Parks, Recreation, and Historic Preservation biologists and managers were interested in better understanding patterns of recovery in the park, to inform management efforts. We used standard sampling methodology to estimate Spongy Moth egg-mass density to map and quantify severity of the outbreak across the park, and to determine recommendations on the potential need for taking additional measures to minimize negative effects of Spongy Moth population outbreaks. We found that outbreak severity and corresponding recommended management actions varied across the park. Of the 4 sites sampled, 1 site contained ~99 new egg masses/ha (~244 new egg masses/ac; no need for management), another site contained ~133 new egg masses/ha (~328 new egg masses/ac; management recommended to prevent noticeable caterpillars), and the 2 remaining sites contained ~227 and ~228 new egg masses/ha (~560 and ~564 new egg masses/ac; management is recommended to prevent noticeable tree defoliation). None of the 4 sites were in the most severe category, in which treatment is recommended to prevent tree mortality. Due to the considerable egg-mass densities across much of the park, we recommend that managers continue to monitor tree recovery and continue to consider education and outreach aligning with best management practices for each site. We also suggest that continued survey and monitoring efforts take place when higher populations of Spongy Moths are present across the state.

Sun- 7

Set Fire to the Grain: Reconstructing Community Assemblages of a Fire-dependent Ecosystem

Lydia Harvey (SUNY Plattsburgh, Plattsburgh, NY), **Amélie Przedwiecki** (SUNY Plattsburgh, Plattsburgh, NY), **Mary Alldred** (SUNY Plattsburgh, Plattsburgh, NY), **Dave Franzi** (SUNY Plattsburgh, Plattsburgh, NY), and **Mark Lesser** (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Paleoecology provides insight on the conditions of ecosystems in the past; how and when they changed over time. By studying these changes, a timeline of disturbance events can be created and the historical trends can be used to predict the future conditions of an ecosystem. Natural disturbances such as wildfires play a major role in ecosystem function and species composition. Our study site was the Altona Flat Rock, which is a sandstone pavement pine barren (Natural Heritage S1G2) located in Altona, NY. The forest community is dominated by *Pinus banksiana* (Jack Pine) at the southernmost extent of its range and *Pinus rigida* (Pitch Pine) at the northernmost extent of its range. The Flat Rock also contains a variety of beaver-pond, riparian, and poor fen wetlands that, in addition to storing carbon in significant peat accumulations, also preserve a historical record of the plant community present at the site. Charcoal accumulation in the peat is also well preserved and provides a record of wildfire occurrences. There have been several documented wildfires at the Flat Rock, the most common occurred in 2018, which burned 225 ha of the Flat Rock. The goal of our study was to investigate long-term changes in forest community composition and fire-return interval for a fire-dependent ecosystem. We collected a 3.24-m core from the center of a poor fen wetland using a Russian peat borer. We sectioned the core into 1-cm intervals and analyzed samples in 5-cm increments for plant macrofossils, pollen, charcoal, and carbon content as loss-on-ignition. Here, we focus on species arrival times and community-assemblage patterns inferred from pollen analysis. Specifically, we are interested in when the Flat Rock became a Jack Pine-dominated pine barrens system. We radiocarbon-dated material from the base of the core and at intervals above that to determine timing of events. Our results document changes in forest species composition, and carbon storage over the site's geologic history that are vital to understand for sound management of the ecosystem.

Sun- 2

Osmoregulation and Metabolic Enzymes in *Anguilla rostrata* (American Eel)

Carl Hoegler (Mount Saint Mary College, Newburgh, NY) and **Charlene F. Blando-Hoegler** (Pace University, Pleasantville, NY)

Abstract - *Anguilla rostrata* (American Eel) undergoes 4 distinct life-history changes: larval leptocephalus, glass eel juveniles called elvers, yellow adults, and silver adults. The larvae migrate from the Sargasso Sea to estuaries in America, transitioning from marine to fresh water. One early study used metabolic enzymes to explain gene distribution in juvenile eels at different latitudes along the US eastern seaboard. We hypothesized that the activities of these metabolic enzymes might provide a clue to osmoregulation. In our study, juvenile stages collected during the early spring from the Quassaick creek tributary survived for 15 days at different dilutions of artificial seawater (ASW). Wide fluctuations in body mass were evident in eels placed in 0% and 100% ASW, suggesting osmo-conformance. The activities of the mitochondrial isoform of malate dehydrogenase (m-MDH) were consistently more active in eel lysates over a range of exposures than for the cytoplasmic isoform (c-MDH). However, the activities of the latter underwent greater fluctuation in eels between salinities. The activities of lactate dehydrogenase (LDH) were more robust in lysates of eels kept at higher dilutions of ASW. The activities of low molecular weight isoforms of acetylcholine esterase (AChE) displayed more variability. The current study implies selected interspecific variations in metabolism measured by isozyme banding patterns of elver stages. More research is needed to provide a complete explanation for its role in osmoregulation.

Sun- 22

Effects of Prescribed Fire on Native and Invasive Understory Vegetation in Northern NJ Hardwood Forests

Jay F. Kelly (RVCC Center for Environmental Studies, North Branch, NJ) and **Jessica Ray** (RVCC Center for Environmental Studies, North Branch, NJ)

Abstract - We studied the effects of prescribed burning on invasive and native understory vegetation in the hardwood forests of northern New Jersey. We collected data from a total of 1227 100-m² quadrats in 85 plots in 14 sites in northern New Jersey from 2015 to 2024. We compared control plots with no fire to adjacent burn plots with 1–3 dormant-season burns. We analyzed results from the first through fifth growing seasons after burns using zero-adjusted beta and gamma generalized additive mixed models (GAMMs) in R depending upon data type. We found significant changes in the % cover and presence/absence of several invasive and native species in response to fire, with decreases in some (e.g., *Berberis thunbergii* [Japanese Barberry], *Lindera benzoin* [Spicebush]) and increases in others (e.g., *Rubus phoenicolasius* [Japanese Wineberry], *Vaccinium* spp. [blueberry]). Significant declines were also observed in the % cover, density, and/or height of trees in both large seedling and sapling size classes following fire. Decreased young-tree density in the control plots also occurred in areas with higher local deer densities. Trends were consistent across forest history types, but much higher amounts of invasive plant species occurred in post-agricultural forests than primary forests. These results, combined with other background differences in native plant composition and tree regeneration in the 2 forest types, suggests that careful biological study is needed prior to management in mid-Atlantic hardwood forests in order to determine whether fire and/or other tools are most appropriate for achieving the desired outcomes and/or avoiding harm.

Sat- 38

The Role of Small Mitigation Wetlands in Supporting Fall Migrating Waterfowl

Lucas Kemmerling (SUNY Plattsburgh, Plattsburgh, NY) and Mary Alldred (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Due to high rates of wetland loss in the United States, legislators under the Clean Water Act have adopted a “no net loss” policy of wetland conservation requiring that if wetlands are to be disturbed, then mitigation efforts are required to offset disturbance. An EPA study revealed these restored, created, or enhanced mitigation wetlands are on average just 1.7 ha (4.3 ac) and can be found anywhere from urban centers to rural areas like the Champlain Valley. This mosaic of small wetlands across the landscape offers important stopover habitat for migratory birds like waterfowl. Unfortunately, not all mitigation wetlands are created equally, and their role in supporting migratory waterfowl is not well studied. Research has revealed that just 21% of mitigation wetlands meet the standards of ecological equivalency to that of the originally disturbed wetland. When this loss of quality is extrapolated across the landscape, we risk the degradation of habitat for species we find valuable, like waterfowl. The aim of our research is to better understand the role of small mitigation wetlands in supporting fall migrating waterfowl to inform quality standards of wetland mitigation. Our research does this by determining the energetic carrying capacity of 5 restored, created, or enhanced wetlands for waterfowl in the Lake Champlain Valley. We used stratified random sampling of plant and invertebrate food biomass (kg/ha) for waterfowl in late summer of 2023 before the fall migration. We divided wetlands into habitat types where we collected potential waterfowl food items such as emergent vegetation, invertebrates, tubers, and submerged aquatic vegetation. We dried and weighed the waterfowl food items and will use these data to estimate the number of waterfowl each wetland can support. Additionally, we have conducted camera surveys to estimate actual waterfowl use at each study area to be compared to estimated carrying capacity. We are currently processing samples and beginning to analyze data with preliminary results to be presented at NENHC.

Sat- 15

Enhancing Field Station Long-term Data Management and Sharing

Bomin Kim (Black Rock Forest, Cornwall, NY), Isabel Ashton (Black Rock Forest, Cornwall, NY), Katie Terlizzi (Black Rock Forest, Cornwall, NY), Scott LaPoint (Black Rock Forest, Cornwall, NY), Hanna Makowski (Black Rock Forest, Cornwall, NY), and John Brady (Black Rock Forest, Cornwall, NY)

Abstract - Black Rock Forest (BRF) is a small non-profit established in 1927 as a research forest in southern New York. BRF owns and adds to several long-term datasets that provide unique and valuable insights into northeastern forest ecosystems, including a 90-year tree-growth record, maps of historic silviculture practices, and several wildlife ecology datasets. Much of these historical and long-term data exist either as paper or outdated digital formats. It is critical to convert these datasets into digital and publicly accessible formats to make the data more discoverable and useful to a broader audience and ultimately to better understand how forests have changed over the last century. We undertook a substantial effort to photograph or scan the raw data, and orthorectify land-use and forestry maps into our GIS, yielding high-resolution digital images and publicly available authoritative spatial layers on ArcGIS Online. We also compiled and cleaned a 90-year record of tree species, canopy class, and diameter, publishing these data via the Environmental Data Initiative (edi.1559.1) We are currently collating, cleaning, and digitizing a 25- year dataset of *Odocoileus virginianus* (White-tailed Deer) records, including winter snow-tracking surveys (orthorectifying field-derived maps), hunter harvest records, winter-severity records, deer-pellet transect surveys, annual oak acorn-crop point surveys, and camera-trap images (available via wildlifeinsights.org). This process has forced our organization to think critically about our data-management strategies and our organizational goals and yielded several publicly available datasets. We will continue to refine our preservation efforts to safeguard long-term data and to ensure a transfer of knowledge to future generations of ecologists and managers.

Sat- 37

Vernal Pool Regulations in the Northeast: Policies, Gaps, and Opportunities

Brenna Knibbs (Siena College, Department of Environmental Studies and Sciences, Loudonville, NY) and **Mary Beth Kolozsvary** (Siena College, Department of Environmental Studies and Sciences, Loudonville, NY)

Abstract - Vernal pools are small, seasonally flooded wetlands that undergo regular cycles of drying and inundation. In the northeastern United States, vernal pools are typically associated with forests and are important features of these landscapes, including serving as key habitats for fairy shrimp (Family: Anostraca) and several pool-breeding amphibian species, such as *Lithobates sylvaticus* (Wood Frog) and *Ambystoma maculatum* (Spotted Salamander). Despite the importance of vernal pools, not all states have regulations to protect them. There is a clear need to better understand the extent of state-level protections of vernal pools across the region, including gaps in protection and ways to improve consistency of protections. We investigated state-level vernal pool policies across 13 northeastern states, and found that states varied widely in their protections of vernal pools. Eight states offered direct protections specifically protecting vernal pools, 3 states protect vernal pools only through non-vernal pool specific legislation, and 2 states lack any protection of vernal pools. The lack of consistent approaches to protections of vernal pools across the region indicates a continued major threat to vernal pools and their associated biological communities.

Sun- 26

Spider Abundance in Lycopodiaceae (Clubmoss) Patches of Central Pennsylvania

Charlotte Kratovil-Lavelle (Dickinson College, Carlisle, PA) and **Carol Loeffler** (Dickinson College, Carlisle, PA)

Abstract - The Lycopodiaceae (clubmoss) family is the oldest, still-living group of vascular plants, first evolving some 400 to 430 million years ago. Today, 27 species of clubmoss are known to exist in North America, but a lack of research has resulted in large knowledge gaps regarding both their distribution and ecological role. The results of a prior study examining Lycopodiaceae taxa led researchers to hypothesize that the “presence of clubmosses may be indicative of highly productive ecosystems that have high invertebrate abundance.” Importantly, these researchers noted that evidence for such an association is lacking. To investigate the relationship between Lycopodiaceae taxa and small, terrestrial invertebrates, we observed 4 clubmoss species, *Dendrolycopodium obscurum* (Flat-branched Tree Clubmoss), *Dendrolycopodium hickeyi* (Hickey’s Tree Clubmoss), *Diphasiastrum digitatum* (Running Clubmoss), and *Huperzia lucidula* (Shining Clubmoss), across 3 sites in central Pennsylvania between 28 September and 27 October 2023. We used 0.09-m² (1-ft²) quadrats to representatively sample invertebrates inside and directly outside of 20 clubmoss patches. We recorded a total of 197 invertebrates within all 120 quadrats, ~60% of which were spiders. Analysis of these data reveals that spider abundance was significantly higher inside clubmoss patches compared to the non-vegetated leaf-litter substrate directly outside of them (Welch’s ANOVA: $F = 21.124$, $df = 1.0$, $P < 0.0001$), supporting the hypothesis that clubmoss patches provide habitat for various spider species. These results suggest that Lycopodiaceae taxa may be more important than previously recognized in providing habitat in northern hardwood forests for spiders and potentially other small invertebrates. As of February 2024, we have documented 48 clubmoss patches between the 3 sites and discovered several patches of Hickey’s Tree Clubmoss, a species that has not previously been documented in either Perry or Cumberland county.

Sat- 30

Chela Loss Increases Predation Risk of Stream-Dwelling Rusty Crayfish

Mark Kuhlmann (Hartwick College, Oneonta, NY) and **Zachary Craft** (Hartwick College, Oneonta, NY)

Abstract - In crayfishes and other decapod crustaceans, the chelae (aka claws) have multiple and various functions, including prey capture and handling, intraspecific agonism, mating, and anti-predator defense. Individuals frequently lose one or both chelae, often by autotomy (self-amputation). While autotomy presumably provides short-term survival benefits (e.g., avoiding predation or limiting blood loss), it can also have longer-term fitness costs, including the energetic cost of replacing the lost limb or a reduction in functions associated with the chelae. We tested the hypothesis that chela loss increases predation risk for *Faxonius rusticus* (Rusty Crayfish) experimentally in both the laboratory and the field. In both experiments, Rusty Crayfish were randomly assigned to 1 of 3 treatment groups (0, 1, or 2 chelae removed). We exposed free-ranging crayfish to predation by *Micropterus dolomieu* (Smallmouth Bass) in wading-pool arenas. In the field experiment, we exposed tethered crayfish to the natural suite of predators at 4 stream sites in the Upper Susquehanna River catchment. Removal of chelae significantly increased predation rate both on free-ranging crayfish in pools and on restrained (tethered) crayfish in the field. These results contrast to previous experiments with juvenile *Callinectes sapidus* (Blue Crab), where limb loss increased predation risk in tethered (constrained) individuals but not for free-ranging crabs. Our results indicate that chela loss imposes a fitness cost on crayfish through increased risk of predation from a variety of predators and suggest that the defensive function of chelae in crayfishes is not dependent on mobility.

Sat- 19

Parasite Prevalence and Intensity in Lake Champlain Basin Fish

Patrick Laurin (SUNY Plattsburgh, Plattsburgh NY)

Abstract - Parasitism in fish has a noticeable impact on not only the environment around them, but also on human affairs such as recreational and commercial fisheries. The goal of this study is to survey parasite prevalence and intensity within several fish species in the Saranac River basin. I collected and dissected >30 samples of fish from multiple species and assessed them for prevalence and intensity of macroparasites. I also identified environmental variables that could influence parasitism. I used local ecological data as well as historical information from over the past decade to determine possible environmental and human-related factors impacting parasite levels in fish within this region. I will discuss patterns of infection across different fish species and the predictive value of environmental factors on parasite prevalence and intensity.

Sun- 21

Playing with Fire: Age Structure Across a Chronosequence of Fire-disturbed Jack Pine Stands

Madelyn Lehman (SUNY Plattsburgh, Plattsburgh, NY), **Zach Hart** (SUNY Plattsburgh, Plattsburgh, NY), **Meghan Bargabos** (SUNY Plattsburgh, Plattsburgh, NY), **James Wholey** (SUNY Plattsburgh, Plattsburgh, NY), and **Mark Lesser** (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Forest structure plays an important role in ecosystem function; structural diversity across a landscape may lead to emergent properties that affect community and ecosystem characteristics as well as vulnerability and resilience to future disturbance. The legacy of past disturbances (e.g., wildfire) gives rise to different-aged forest patches that differ in structure and in resilience and recovery potential following new disturbances. It's important to understand disturbance-structure interactions across time and space, and how they affect ecosystem properties (e.g., carbon sequestration or wildlife habitat). The objective of this study was to determine how past disturbances shaped the landscape at the Altona Flat Rock pine barrens in northern New York. The Flat Rock is a ~2000-ha, globally rare, sandstone pine barrens dominated by *Pinus banksiana* (Jack Pine), a serotinous species dependent on fire to open cones, release seed, reduce understory competition, and expose mineral soil. Portions of the Flat Rock burned in 1940, 1957, and 2018; however, the exact extents and spatial configuration of each disturbance is unknown. To understand the spatial arrangement of stand ages at the Flat Rock, we increment-cored 3 trees at each of 3 randomly selected sites within each of twenty 1-km² grid cells spanning the Flat Rock, of which 35 sites were accessible and contained mature living Jack Pine in 2022. In 2023, we returned to 15 sites that had shown high levels of variability in establishment age and cored an additional 10 trees at those sites, resulting in a total of 226 establishment dates spanning the 3 historical disturbance extents. We found equal proportions of trees established immediately following a disturbance as established >5 years prior to the disturbance, while a much lower proportion of trees established >5 years following a disturbance. These results suggest that fire is important for Jack Pine regeneration, but does not completely replace the stand, as is commonly thought—with many trees surviving disturbances. Surviving trees act to homogenize forest structure across stands that vary in time since disturbance. These results provide insight into the legacy of past disturbances along with landscape-level response and resilience to future disturbances.

Sun- 4

Nesting Patterns of Cavity-Nesting Bees and Wasps

Daniel Lemon (SUNY Geneseo, Geneseo, NY), **Emma Parker** (SUNY Geneseo, Geneseo, NY), Carly Wick (SUNY Geneseo, Geneseo, NY), and Jennifer Apple (SUNY Geneseo, Geneseo, NY)

Abstract - Cavity-nesting bees and wasps will lay eggs in hollow stems and other pre-made cavities and provision their larvae with food; their developing offspring generally overwinter in the tubes and emerge the following spring. To observe the nesting patterns of these insects, we placed nesting boxes containing “bee tubes” made of hollow natural reeds in 5 locations across the SUNY Geneseo campus. From the end of May until the beginning of October, we observed and photographed the tubes once a week as the tubes were gradually sealed off by insects to form larval cells, noting the type of material used, any visible inhabitants, and the extent of fill in each tube. The most common fill types observed included mud, leaf materials, and grass. We then analyzed the trends in the phenology and site preferences of the various fill types using the photographic record, finding that the tubes filled up with light-colored mud early in the summer, while the leaf material and grass became more common fills in the second half of the summer and into the fall. The mud material also seemed more common overall, but in areas with an abundant supply of tall grass, such as a meadow, grass-type fill dominated. Over the winter, we dissected the tubes to determine their inhabitants so we could associate fill types with the actual occupants. We found the pupae of Eumeninae (potter wasps) in the mud-filled tubes, Megachilidae (leaf-cutter bees) in the leaf-filled tubes, and Sphecidae (grass-carrying wasps) in the grass-filled tubes. In addition to the surviving inhabitants, dead, undeveloped larvae were also observed in several tubes, possibly as a result of the various, seemingly taxa-specific parasites found in the tubes. A greater understanding of the nesting patterns of these bees and wasps can aid researchers in monitoring these taxa through nest boxes and provide information that can assist in maintaining strong, reproducing populations of these important insect species.

Sun- 35

Atlantic White Cedar Swamp Ecological and Cultural Stewardship at Bradford Bog, NH

Geneva Lish (University of New Hampshire [UNH], Durham, NH), **Holly Wajenberg** (UNH, Durham, NH), Heidi Asbjornsen (UNH, Durham, NH), Matthew Vadeboncoeur (UNH, Durham, NH), and Teresa Cohn (UNH, Durham, NH)

Abstract - *Chamaecyparis thyoides* (Atlantic White Cedar [AWC]) swamps stretch from southern Maine to central Florida, but their current extent is ~20% of their historic coverage due to anthropogenic interventions. Members of the Nulhegan Band of the Coosuk Abenaki attest that AWC swamp ecosystems played a significant role in providing traditional resources like canoes and baskets, as well as serve as sacred spaces for cultural and spiritual practices. Some community members are concerned about the lack of AWC regeneration and the declining health of these ecosystems, specifically at the Bradford Bog, NH. Among the remaining AWC communities, the Bradford Bog stands out as one of the most well-preserved and northernmost areas. The goal of this study is to determine the regeneration rates of AWC in Bradford Bog and to explore how land trusts are navigating land stewardship and access for Indigenous tribes in New Hampshire. We conducted a seedling-regeneration survey at the Bradford Bog along transects during the summer of 2023. We also explored Indigenous relationships with Bradford Bog through conversations, archival documents, and literature reviews. Our results revealed that while mature AWC trees were found on all study transects, only 1 transect surveyed had AWC seedlings present. Our results also found a scarcity of information relating to the cultural history of Bradford Bog at both the local and regional level, despite its historic presence as a tourist destination post-colonization. Our next steps include conducting a dendrochronological analysis to assess stand dynamics, and a more detailed regeneration survey and site characterization to identify and better understand factors supporting AWC sustainability and restoration in summer 2024. Additionally, we will be conducting interviews with 5–10 land trust staff in New Hampshire to explore challenges, opportunities, and approaches related to engaging Indigenous communities in land stewardship and conservation initiatives.

Sun- 27

Growth and Frequency of *Tsuga canadensis* Seedlings on Moss, Soil, and Dead Material Substrates

Christopher Lozano (Dickinson College, Carlisle, PA)

Abstract - *Tsuga canadensis* (Eastern Hemlock) is a conifer species covering most of the eastern US, from Nova Scotia down to parts of Alabama and going as west as Lake Superior. Eastern Hemlocks have an integral role in their environment, as they provide habitats for many species of birds, control the nutrient cycling of primarily carbon and nitrogen, and assist in maintaining a stable microclimate by maintaining the soil pH and moisture content. Unfortunately, the mortality of Eastern Hemlock has increased due to the invasive species *Adelges tsugae* (Hemlock Woolly Adelgid). My study aims to combat this increase in mortality by studying which substrates Eastern Hemlocks most frequently recruit seedlings and where they grow the best. I ran transects at several sites in south-central Pennsylvania to quantify substrate availability, assess seedling abundance in each substrate, and measure new growth on seedlings in each substrate. Preliminary results show a preference for decomposed wood and organic soil over sphagnum; full results showcasing hemlock seedling growth on moss and dead material substrates will be presented. My study is critical because it opens new discussions on forest-management strategies for Eastern Hemlock to combat their increasing mortality.

Sat- 32

Analyzing Street-Tree Diversity Over Redlining Districts in Schenectady, NY

Allison Malatesta (Union College, Schenectady, NY) and Jeffrey Corbin (Union College, Schenectady, NY)

Abstract - Street trees are an important part of an urban neighborhood's ecosystem and provide many benefits to the surrounding area. Trees require investment by city governments, as they necessitate careful planning and care. However, certain neighborhoods have historically received greater levels of investment. In the 1930s, the United States adopted a federal financial program commonly called "redlining". The Home Owners' Loan Corporation divided city neighborhoods into classes based on loan security, resulting in wealthy, typically white neighborhoods receiving the highest designation, an A grade, while poorer neighborhoods were "redlined", and received a D-grade. This program was racially motivated and targeted people of color. In this study, we analyzed differences in street-tree growth and species diversity in neighborhoods in Schenectady, NY, to document the effects of institutionalized racism on the ecology of urban neighborhoods. We compared tree size, density, and species diversity between each loan-security designation. There were not enough replications of A-grade neighborhoods within current Schenectady city limits, so we analyzed differences between B-, C-, and D-grade neighborhoods. We found that C- and D-grade neighborhoods had significantly fewer trees in all size classes (small, medium, and large) than B-grade neighborhoods. D-grade neighborhoods also showed lower species diversity in existing trees than C- and B-grade neighborhoods. These contrasts in our findings between the redlined and higher-grade neighborhoods show the lasting effects of the dissimilarities in city investment into providing a healthy environment for city residents. These results support our hypothesis that redlining has created an institutionalized racist legacy that reflects continued environmental injustice.

Sun- 42

How Does Injury Affect Larval Damselflies?

Emma J. Mazeika (Siena College, Albany, NY), Alexis N. Dawes (Siena College, Albany, NY), and Sarah K. Berke (Siena College, Albany, NY)

Abstract - Invertebrates are critically important components of aquatic ecosystems worldwide. Many freshwater invertebrates represent the immature (larval) stages of terrestrial insects. Damselflies, for example, lay eggs in ponds and streams that hatch into flightless, fully aquatic larvae. These larvae spend weeks to months feeding and growing underwater before undergoing a terminal molt and emerging as winged adults. Larval damselflies are predators of smaller invertebrates, and are themselves prey for larger insects, fish, and amphibians. Interactions with predators, even when not lethal, can result in injury, such as the loss of a limb or other appendage. Such injuries would potentially influence an individual's growth, ecological function, and future reproductive success. Damselflies have 6 legs as well as 3 large posterior gills; these gills are used for both gas exchange and for swimming. Gills are frequently lost to predator encounters; we would expect such loss to influence multiple aspects of the larva's biology including swimming speed and predator escape. We are investigating the ecology of injury in larval damselflies at 2 sites in Albany County, NY: Ann Lee Pond and Little's Lake. We will present preliminary data for rates of gill and leg injury for the most common genera at these sites, *Enallagma* and *Ischnura*. We will also report on progress to date for experiments evaluating whether gill loss influences swimming speed within these genera.

Sun- 33

Horseshoe Crab (*Limulus polyphemus*) Population Structure and Abundance in a Back-barrier Salt Marsh Lagoon in Cape Cod National Seashore

Kelly McCusker (Antioch University New England, Keene, NH), **Sophia Fox** (Cape Cod National Seashore, Wellfleet, MA), **Rachel Thiet** (Antioch University New England, Keene, NH), **Allie Myers** (Coonamessett Farm Foundation, East Falmouth, MA), **Katie Button** (Cape Cod National Seashore, Wellfleet, MA), and **Kta'n Weeden** (Sandwich, MA)

Abstract - East Harbor is a back-barrier salt marsh lagoon with both freshwater and tidal input. Starting in the mid-19th century, artificial tidal restriction caused a variety of negative impacts, such as water-quality degradation, fish kills, algal blooms, and insect outbreaks. In 2002, the Town of Truro and Cape Cod National Seashore partially restored tidal input by opening a culvert 244 m (800 ft) in length that reconnected East Harbor to Cape Cod Bay. The reintroduction of tidal flow has improved salinity and water quality and increased the diversity and abundance of estuarine flora and fauna. In recent years, invertebrate predators like the regionally vulnerable *Limulus polyphemus* (Horseshoe Crab) have become abundant in East Harbor, contributing to the re-establishment of a complex estuarine food web in this previously degraded system. In our study, we aim to examine the abundance and population structure of Horseshoe Crabs in East Harbor, as well as track Horseshoe Crab movements to understand their habitat use throughout the system and in adjacent Cape Cod Bay. The result of our study will help Cape Cod National Seashore make science-based decisions on the management of this natural resource.

Sun- 43

Palatable Plastics: Organ-specific Assessment of Microplastic Abundance in Fish

Thomas McDonough (SUNY Plattsburgh, Plattsburgh, NY), **Davin Sherwood** (SUNY Plattsburgh, Plattsburgh, NY), and **Danielle Garneau** (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Microplastics have plagued fish communities since the inception of industrialization, and regulations have not been keeping pace. In the environment, these particles have become ubiquitous and are found in air, soil, and remote lakes. Microplastics are defined as particulates that are less than 5 mm in size and are characterized by type (e.g., fragment, fiber, film, foam, bead, and pellet), color, polymer, and size. Fish uptake particulates via ingestion, gill-filament adhesion, and absorption. These microplastics have the potential to reduce reproduction, feeding, and survival. We conducted a survey of microplastics in fish found within the Saranac River (fall 2023) and local lakes (spring 2024) in Clinton County, NY. We use wet peroxide oxidation to isolate microplastics within digestive tracts and gill filaments and the separated samples by size (e.g., 1 mm, 355 μ m, 125 μ m). We quantified and characterized particulates under a dissecting microscope. Fish generally had higher microplastic burdens in the stomach compared to intestines, specifically 4.06 and 2.40 particles per gram, respectively. Microplastic burdens were species-specific, with 0.2918, 0.2591, 0.1496, 0.0618, and 0.0086 particles per gram, across *Semotilus corporalis* (Fallfish), *Micropterus dolomieu* (Smallmouth Bass), *Salmo trutta* (Brown Trout), and *Esox lucius* (Northern Pike), respectively. Most particulates were blue fibers of small size class (125 μ m). Preliminary data, derived from gill filaments of *Esox niger* (Chain Pickerel), suggest that dark fibers are common. Moving forward, we will be processing *Perca flavescens* (Yellow Perch) and *Salvelinus namaycush* (Lake Trout), which were recent donations from an ice-fishing derby on Chazy and Upper Chateaugay lakes. These fish will enable us to make tissue-specific (e.g., gills, stomach, intestines) comparisons of microplastic burdens. Our research speaks to the imperative that anglers understand microplastic pollution risks associated with their catches and offers an opportunity for community efforts to reduce our dependencies on plastic.

Sun- 20

Effect of Irregular Shelterwood Cut on Bark Beetle Density and Richness in Old-growth Sugar Maple Canopies

Alannah McGarry (SUNY ESF, Syracuse, NY), Greg McGee (SUNY ESF, Syracuse, NY), and Laurel Schuster (SUNY ESF, Syracuse, NY)

Abstract - The nature of bark beetles (Curculionidae: Scolytidae) as pests, particularly in western North America, has been well documented. However, the nature of bark beetle communities have been understudied in northeastern forests. Understanding the native insect communities that populate northeastern forests is crucial in the context of forest ecosystem-management objectives, as well as global climate change. This study aims to understand the stand-level effect of an irregular shelterwood cut as well as the micro-environmental effects associated with tree diameter on arboreal bark beetle communities (density, taxonomic richness, composition). We sampled the canopies of 19 trees in the irregular shelterwood, and an adjacent control stand by installation of 1 flight-intercept trap and 2 arboreal-pitfall traps in each tree. We collected 160 bark beetles comprising 5 genera: *Ambrosiodmus* (64% of sample), *Anisandrus* (9%), *Xyloborinus* (10%), *Xylosandrus* (1%), and *Gnathotrichous* (<1%). We could not identify 15.29% of the sampled bark beetles. The average bark beetle capture in the shelterwood ($12.7 \pm 1SE$) was 3-fold greater in the irregular shelterwood cut versus the control stand. Density was found to be weakly negatively correlated with tree diameter ($R^2 = 0.027$). The difference between the average maximum canopy temperatures ($P = 0.04$) and the difference between the average maximum ground temperatures ($P < 0.001$) were found to be statistically significant between the irregular shelterwood cut and the control plot.

Sat- 29

Effect of Habitat Characteristics and Wetland Management on Least Bittern Occupancy in Missouri

Ryan McGinty (SUNY Brockport, Brockport, NY), Kristen Malone (SUNY Brockport, Brockport, NY), Lisa Webb (USGS, Columbia, MO), Arianne Messerman (Missouri Department of Conservation, Columbia, MO), Janet Haslerig (Missouri Department of Conservation, Jefferson City, MO), and Doreen Mengel (University of Missouri, Columbia, MO)

Abstract - *Ixobrychus exilis* (Least Bittern) is a species of secretive marsh bird that depends on wetland habitat throughout its life cycle. It is a species of conservation concern in several US states where their populations are declining, likely due to habitat loss. The purpose of this project is to determine the effect of habitat characteristics and wetland management practices on Least Bittern distribution in a portion of their breeding range. To accomplish this, we conducted call-playback surveys at 84 survey points placed in 43 emergent wetland pools. We collected both habitat data at every survey point and data on the management practices at each wetland pool. Least Bittern site occupancy was positively associated with percent cover of both tall emergent vegetation ($\beta = 0.741$, 95% CI = 0.107, 1.569) and open water ($\beta = 0.957$, CI = 0.320, 1.716) and negatively associated with percent cover of both short emergent vegetation ($\beta = -0.723$, CI = -1.569, -0.009) and bare ground ($\beta = -1.225$, CI = -2.48, -0.264). Water depth was positively associated with Least Bittern occupancy ($\beta = 1.429$, CI = 0.614, 2.521). Points with greater interspersions were more likely to be occupied by Least Bittern (mean occupancy = 0.499, CI = 0.256, 0.786) than points with less interspersions (mean occupancy = 0.175, CI = 0.051, 0.367). Wetland pools that were permanently inundated with water were more likely to be occupied by Least Bittern (mean occupancy = 0.700, 95% CI = 0.330, 0.976) than sites that were drawn down every other year (mean occupancy = 0.488, CI 0.137, 0.883) or every year (mean occupancy = 0.207, CI = 0.077, 0.380). Least Bittern occupancy was also positively associated with a later initiation of spring drawdowns (effect size = 1.384, CI = 0.288, 4.490). The decrease in wetland habitat in the US coupled with the decline in Least Bittern populations in portions of their breeding range suggest that the few remaining wetlands are crucial for the persistence of Least Bittern. The results of this project may help inform what habitat characteristics can be managed in a manner to benefit Least Bittern populations.

Sat- 14

Long-term Manual Control of Invasive *Typha* in a Central New York Fen to Reduce Thatch Accumulation

Alicia McKenzie (SUNY Oswego, Oswego, NY) and C. Eric Hellquist (SUNY Oswego, Oswego, NY)

Abstract - *Typha angustifolia* (Narrowleaf Cattail) and the hybrid cattail *Typha x glauca* are invasive plants that have become dominant in many North American wetlands. In central New York, cattails have increased their dominance in Lake Ontario's shoreline wetlands and some peatlands (fens). Cattail colonization can alter habitat structure in fen communities via the deposition of dead biomass that becomes layered thatch. We worked in an Oswego County fen where cattails have been encroaching within sensitive floating mat habitats. To preserve biodiversity and maintain the structure of the fen habitat, we conducted a long-term study to measure the effectiveness of manual control (cutting) to reduce the growth and spread of *Typha*. We cut cattails during the spring and fall seasons over 6 years to determine which season would be the most effective at reducing cattail density. There was a gradual decline in the stem counts and biomass of the cut plots and large decreases when compared to uncut plots. Following 2 years without cutting, in the spring, we observed 2x fewer living stems and 1.5x more living biomass. There were 0.96x more dead stems and 1.6x less dead biomass following the pause in management. In the fall, there were 1.2x fewer living stems and 2x more living biomass. Meanwhile, there were notable increases in both dead stems (23x more) and dead biomass (58x greater) following the 2-year management pause in the fall. When our 2023 cut plots were compared to uncut plots in 2023, our uncut plots had 16x more living stems and 5x more dead stems. Even with a hiatus in cutting, our data shows the value of manual removal of *Typha* for reducing stems and their transition into habitat-altering thatch.

Sat- 18

Unearthing the Role of Root Functional Traits in Old-Field Forest Succession: Implications for Biodiversity and Ecosystem Services

Gisselle Mejía (Dartmouth College, Hanover, NH), Chenyang Su (Dartmouth College, Hanover, NH), David Allen (Middlebury College, Middlebury, VT), V. Bala Chaudhary (Dartmouth College, Hanover, NH), and Theresa W. Ong (Dartmouth College, Hanover, NH)

Abstract - Old-fields are ubiquitous in forested ecosystems of the Northeast region of the US that have undergone ecological succession following abandonment from agricultural use. This process involves changes in vegetation composition, influenced by factors such as land-use history, soil conditions, and dispersal limitations. However, many studies have focused on aboveground competition and dispersal dynamics, such as competition for light, successional stage, and seed source and establishment, while less attention has been placed on belowground processes that facilitate plant resource uptake that can also modify the outcome of competitive interactions. In this study, we used a trait-based approach to examine how aboveground plant composition and distribution vary with plant-root functional traits (e.g., mycorrhizal association) that mediate access for nutrients such as nitrogen (N) and phosphorous (P). We inventoried every tree stem ($n = 11,653$) in a 10-ha forested area containing old-fields and historical forests and matched every species with root functional traits ($n = 32$) from established databases. We found that land-use history influences community composition and distribution in old-fields forests, which also varied with belowground root functional traits. Community composition in old-field forests contained more *Acer* spp. species (e.g., *Acer saccharum* [Sugar Maple]) and were associated with root functional traits related to root chemistry and arbuscular mycorrhizae (AM), while community composition in historical forests were composed of mostly *Tsuga canadensis* (Eastern Hemlock) and associated with root functional traits related to root morphology and ectomycorrhiza (EM). These results suggest that changes in aboveground community have implications for belowground ecosystem services (e.g., nutrient cycling) important to forest-ecosystem development. Trait-based approaches can elucidate mechanisms of community assembly, and understanding how traits influence species coexistence and interactions can inform management decisions related to biodiversity conservation and restoration efforts in disturbed or altered forests.

Sat- 40

Too Cold to Migrate?: Analyzing Amphibian Spring Activity Below 4.4 °C (40 °F) for Future Conservation Management Implications

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Abstract - In the Northeast, amphibian spring migration typically occurs between mid-March and mid-April and is spurred by increasing ambient temperatures and precipitation. Significant mortality can occur during this period when amphibian species cross roads to reach breeding and egg-laying sites. Road closure is a management practice for mitigating mass mortalities of dispersing amphibians and is generally executed during rainy nights when ambient temperatures are at or above 4.4 °C (40 °F) at known crossing hot spots. Using 18 seasons of community science data from 1 road crossing hotspot in Salisbury, VT, we analyzed how nighttime temperature influenced individual amphibian species presence during spring migration, and how temperatures below and above 4.4 °C (40 °F) influenced the diversity of 5 early spring migrating species: *Ambystoma laterale* (Blue-Spotted Salamander), *Ambystoma maculatum* (Spotted Salamander), *Hemidactylium scutatum* (Four-Toed Salamander), *Lithobates sylvaticus* (Wood Frog), and *Pseudacris crucifer* (Spring Peeper). Early migrating species diversity was only marginally higher above 4.4 °C (40 °F) compared to below this temperature threshold, and all 5 early-spring migrating amphibian species present at this site were active at ambient temperatures both below and above 4.4 °C (40 °F). We will also show our findings for individual amphibian species in relation to this temperature threshold, as well as along a continuous gradient of temperature. From our preliminary results, we suggest that researchers and conservationists evaluate the presence of amphibians at road crossings when the nighttime temperatures are below 4.4 °C (40 °F) during spring migrations, and potentially advocate to close roads on these nights as well.

Sun- 24

Can It Grow? Investigating Aeration Techniques When *Tagetes patula* Are Grown Under Hydroponic Conditions

Skylah J. Miller (SOILLESS, Torrington, CT)

Abstract - The world is in a water crisis. The water available for drinking and hygiene is decreasing significantly. One way to use water wisely is to change the ways of typical agriculture. Traditional agriculture is one of the main consumers of fresh water contributing to the fast-upcoming freshwater shortage. An alternative approach is hydroponics. Various studies have demonstrated that hydroponics conserves more freshwater than the typical agricultural farming. A significant consideration for hydroponics is the aeration of the water used. In this experiment, *Tagetes patula* (Queen Sophia Marigold) will be grown in various recycled cans with different aeration methods (no aeration, manual, and electrical). For each method there will be a total of 4 replicates. I will record several different types of data throughout this experiment. Some will be qualitative, including but not limited to observations of any remarkable growths on the plants, in the water, or on the sponges as well as leaf shape, plant color, and general appearance of plants. Quantitative measurements will include pH, nitrate levels, nitrite levels, temperature, growth rate measured as growth daily above the sponge surface, daily leaf count, and a maturity count (number of flowers in bloom).

Sat- 47

Effects of Vegetation Characteristics and Time Since Mowing on Nest-site Selection and Nest Survival of Savannah Sparrows (*Passerculus sandwichensis*) in Western New York

Hailey Mitchell (SUNY Brockport, Brockport, NY) and Kristen Malone (SUNY Brockport, Brockport, NY)

Abstract - Since the 1970s, grassland bird populations have been declining. The main causes of the decline include habitat loss and degradation. This decline has led to the need for more information on what habitat characteristics are needed for grassland birds to successfully breed and how management practices impact breeding success. Our objective was to determine the nesting-habitat preferences of *Passerculus sandwichensis* (Savannah Sparrow) and how nest-site characteristics along with mowing practices influence the probability that a nest will fledge young (nest survival). We conducted this study over an 8-week period at John White Wildlife Management Area in Basom, NY. We searched for Savannah Sparrow nests using behavioral cues and monitored them every 2–3 days to determine nest fate. Vegetation characteristics at each nest along with a corresponding random point were measured. We also gathered data on the history of mowing practices at each field within our study site. We found and monitored 21 Savannah Sparrow nests. Our results showed that nest visibility within a 1-m radius of the nest was a significant factor in nest-site selection ($\beta = -0.14$, 95% CI = -0.28, -0.03). Vegetation height, litter depth, vertical vegetation density and percent *Panicum virgatum* (Switchgrass) within 1 m and 5 m of the nest did not influence nest-site selection. The probability that a nest survived a single day was 0.951 (95% CI = 0.911, 0.980). Vertical vegetation density at 5 m from the nest had a significant positive effect on nest survival ($\beta = 1.303$, 95% CI = 0.243, 2.734) and was the only vegetation factor that influenced nest survival. Time-since mowing did not impact nest survival. The results we found could be used to help managers create high-quality habitat for Savannah Sparrows, a species of high priority for conservation in New York.

Sat- 2

Multisite Approach for Monitoring Migrant Raptor Counts within the Atlantic Flyway of North America

Zofia Myszko (Ramapo College of NJ, Mahwah, NJ) and Eric Wiener (Ramapo College of NJ, Mahwah, NJ)

Abstract - Many groundbreaking contributions to our understanding of raptor migration come from data collected at Hawk Mountain Sanctuary (Kittatinny Ridge, PA) and Cape May Bird Observatory (Atlantic coast, NJ). The purpose of this study was to examine if data from a carefully selected group of hawkwatch sites between the Kittatinny Ridge and the Atlantic coast can boost our understanding of raptor migration through the Atlantic Flyway of northeastern North America. We conducted diurnal migrant raptor counts in the Ramapo Mountains (New Jersey Highlands) nearly every rainless hour during fall migration season from 2014 to 2023, while data from the other study sites was retrieved from HMANA's hawkcount.org online database for the same time period. The specific sites used for data analyses were selected in part to minimize double counting of migrants among sites. Results of our analyses revealed that annual migrant count totals for *Buteo platypterus* (Broad-winged Hawk), *Buteo lineatus* (Red-shouldered Hawk), and *Cathartes aura* (Turkey Vulture) were by far the highest within the region between the Kittatinny Ridge and the Atlantic coast. *Accipiter striatus* (Sharp-shinned Hawk), *Accipiter cooperii* (Cooper's Hawk), *Falco sparverius* (American Kestrel), *Falco columbarius* (Merlin), *Circus hudsonius* (Northern Harrier), and *Pandion haliaetus* (Osprey) consistently exhibited the highest counts at Cape May. Surprisingly, *Aquila chrysaetos* (Golden Eagle) was the only species for which annual count totals were consistently highest at Hawk Mountain. After combining data from Hawk Mountain, Cape May, and sites in the region in between, populations of most species appeared to be relatively stable over the 10-year period of study with only 2 exceptions. Golden Eagles exhibited a statistically significant negative trend ($P = 0.028$), and Turkey Vultures exhibited a statistically significant positive trend ($P < 0.001$). In conclusion, despite a large portion of existing literature focusing on the Kittatinny Ridge, our results suggest that Golden Eagles may be the only diurnal raptor species that rely mostly on that region during fall migration through the Atlantic Flyway. We suggest that understanding of the migrant raptor populations that pass through the Atlantic Flyway can greatly benefit from approaches that include previously underrepresented sites.

Sat- 10

Distribution of Invasive Earthworms in a Suburban Nature Preserve in Southern NY Determined Using Fieldwork and eDNA Metabarcoding

Sofia Nastasi (Mianus River Gorge Preserve, Bedford, NY), **Chris Nagy** (Mianus River Gorge Preserve, Bedford, NY), **Amelia Whitehurst** (SUNY Purchase, Purchase, NY), and **Stephen Harris** (SUNY Purchase, Purchase, NY)

Abstract - Non-native species negatively impact the habitats they invade. *Amyntas* spp., a genus of South Asian earthworm, is becoming increasingly common in coastal North American habitats. Earthworms are epigeic detritivores, they live in and use the litter layer found above soil as a food source. Their role is essential to a functioning ecosystem but becomes detrimental in excess. Lack of natural predators in North American ecosystems and an annual life cycle allow these earthworms to over-consume available organic matter, resulting in wasted nutrients and unwanted competition. It is understood how they cause ecological distress, but not the patterns that influence distribution. We sampled 56 plots for *Amyntas* at the Mianus River Gorge Preserve in Bedford, NY. We analyzed worm distribution with indicators of soil health and forest features and compared our data to a previous survey performed in 2010. We found that *Amyntas* distribution increased throughout the preserve. In addition, we used eDNA metabarcoding analysis with the goal of detecting *Amyntas* DNA as an alternative sampling method. Soil samples underwent DNA extraction, PCR, and sequencing for species identification. *Amyntas* spp. were not detected; however, we did detect another segmented worm species, *Achaeta affinis*. *Achaeta affinis* is a European potworm species with key morphological and ecological similarities to *Amyntas*.

Sun- 10

Prescribed Burn Impact on *Pinus rigida* (Pitch Pine) Demographics and Growth

Sarah Newton (Saint Michael's College, Colchester, VT), **Jackson Sargent** (Saint Michael's College, Colchester, VT), **Skyleigh Bickings** (Saint Michael's College, Colchester, VT), and **Declan McCabe** (Saint Michael's College, Colchester, VT)

Abstract - We conducted this study to determine if controlled burns in Vermont sandplain forests are able to reset succession, allowing *Pinus rigida* (Pitch Pine), an early successional pioneer species, to grow and prevent *Pinus strobus* (Eastern White Pine), a late-successional climax species, from overshadowing and dominating the landscape. We measured diameter at breast height (DBH) and increment-core ring length from representative Pitch Pines at control sites and at 3 sites in Camp Johnson in Colchester, VT, where prescribed burns occurred in 1995, 1998, or 2013. Our results confirm White Pine domination of the unburned patches across all ages of the lifespan and reveal increased Pitch Pine growth rates following prescribed burning. Our data suggest that active management including the use of prescribed burns can reset succession in favor of Pitch Pines in Vermont's remaining sandplain forests.

Sun- 3

Assessing Efforts to Control Giant Hogweed in New York State

Ryan Nowak (Union College, Schenectady, NY) and **Jeffrey Corbin** (Union College, Schenectady, NY)

Abstract - To mitigate and prevent biodiversity loss due to invasive species, ecologists and wildlife managers must actively monitor and stop the spread of exotic species from entering native ecosystems. When prevention fails, control programs may be used to remove the exotic species by the most effective method, including mechanical, chemical, or biological means. However, examples of successful control are rare. This study assessed efforts by the New York State Department of Conservation (NYSDEC) to control *Heracleum mantegazzianum* (Giant Hogweed) in New York State. Giant Hogweed is a federally listed noxious weed that can impact native plant species and also human health. NYSDEC Division of Lands and Forests Bureau of Invasive Species and Ecosystem Health has targeted Giant Hogweed by targeting all locales where it is known to grow with mechanical and/or chemical treatment. Sites are treated each year until plants are gone, and then monitored for 9 years before a site is declared "controlled". We modeled how the initial size of the infestation and the duration of treatment affected the likelihood of success in controlling individual Giant Hogweed infestations. The number of sites increased from 2008 to 2022 to a total of 4112 during the timeline of our data, but the state-wide total area of infestation and average area per site decreased. We found that the probability of successful control of individual infested sites—defined by 9 years without plants—was 30% for the smallest sites and decreased as a site's infestation size increased. Although the probability of complete control at each site was relatively low, current methods implemented by the NYSDEC successfully decreased the size of individual infestations. We emphasize that identifying sites in the early stages of infestation—when the area needing control is small—provides the NYSDEC with the greatest possibility for success.

Sun- 12

iMapInvasives: Sharing Invasive Species Information for Strategic Natural Resource Management

Mitchell O'Neill (New York Natural Heritage Program, Albany, NY) and **Douglas Knoph** (New York Natural Heritage Program, Albany, NY)

Abstract - iMapInvasives is an online, collaborative, GIS-based database and mapping tool used for tracking invasive species in North America. iMapInvasives is used by natural resource professionals, community scientists, and members of the public to both submit and obtain information about invasive species. The platform enables real-time tracking of infestations and informs management decisions to protect native species and ecosystems. Powered by the international non-profit, NatureServe, iMapInvasives can be used anywhere in North America, and is actively used in several US states and Canadian provinces. In New York State, iMapInvasives serves as the official database for invasive species work, administered by the New York Natural Heritage Program (NYNHP), a partnership between SUNY College of Environmental Science and Forestry and the NYS Department of Environmental Conservation. Key users include the Partnerships for Regional Invasive Species Management (PRISMs), state agencies, various non-profits, community scientists, students, educators, researchers, and members of the public. Key features include a filterable map interface with data summary tools, mobile reporting tools, customizable email alerts, and the ability to track survey efforts (including presence and not-detected data) as well as management efforts and their effectiveness over time.

Sun- 15

Forest Dynamics Between Co-occurring Native and Invasive Species

Alexis Ochs (SUNY Geneseo, Geneseo, NY), **Jessie Seifert** (SUNY Geneseo, Geneseo, NY), **Kathleen Lewis** (SUNY Geneseo, Geneseo, NY), and **Suann Yang** (SUNY Geneseo, Geneseo, NY)

Abstract - Invasive species can co-occur with native species, with varying effects on the community of native species. Invasive species may outcompete native species or have a facilitative (positive) effect. In our study, we focus on tree species of invaded forest communities. We applied a spatially explicit, statistical model to analyze interspecific neighborhood competition in the Michigan Big Woods. The Michigan Big Woods has a high density of invasive tree species and is being invaded by *Berberis thunbergii* (Japanese Barberry). We analyzed the interactions between invasive and native species using census data for the years of 2003, 2008, and 2014. We found that there was intraspecific competition among *Carya ovata* (Shagbark Hickory), *Carya glabra* (Pignut Hickory), and *Quercus velutina* (Black Oak), which are all native species of trees. Also, we found that there was not a substantial change in the effect of invasive species on the growth of native oak and hickory species, despite the rapid spread of Japanese Barberry between 2003 and 2014. These results suggest that adult trees can still acquire sufficient nutrients during this period of invasion. By constructing graphs and maps of native and invasive species over time, we were able to detect changes in population age structure. Thus far, our findings indicate that most trees in the forest are mature, shown by their large diameters at breast height (DBH), with a limited presence of young trees. Together with the rapid spread of Japanese Barberry over the same period of time, this change in age structure suggests that invasive species in this forest are inhibiting establishment of young trees, which has implications for forest regeneration. Understanding these impacts is important for discerning the long-term implications of invasive species on native trees in a forest. This information can help tailor ecological management strategies for specific forest communities and expand our ability in measuring the effects of the invasion of forests to prioritize conservation resources effectively.

Sat- 41

Picking Through Puke: The Utility of Otoliths in Common Tern Pellets for Seabird Diet Research

Asher Panikian (College of the Atlantic, Bar Harbor, ME, and University of New Hampshire, Durham, NH), Aliya Caldwell (University of New Hampshire, Durham, NH), Nathan Furey (University of New Hampshire, Durham, NH), and Elizabeth Craig (University of New Hampshire, Durham, NH)

Abstract - The Isles of Shoals are a group of small islands located 9.7 km (6 mi) offshore in the Gulf of Maine, spanning across the Maine and New Hampshire state borders. Two of the islands, White and Seavey, are home to a mixed colony of *Sterna dougallii* (Roseate Tern) and *Sterna hirundo* (Common Tern). Recent research on White and Seavey islands focuses on the foraging habits of the Common Terns, which primarily consume larval and juvenile marine fish. A combination of observation, video recordings, and purse seine fishing have been used to characterize which forage fishes the terns rely on during their breeding season on White and Seavey islands. Although these methods provide a very well-rounded idea of the species being predated, there are inevitably instances of predation that are not recorded any time the terns are not actively being observed. In order to account for this, we collected pellets, consisting of regurgitated indigestible or difficult to digest matter, from the islands in 2022. Within these pellets bones called otoliths can frequently be found. They are a part of the inner ear of a fish, and can be used to identify fish to the species level. However, they rarely pass through the digestive tract unscathed. Our study focuses on determining the practicality of otolith analysis as a tool for providing supplemental diet data for the Shoals colony. We characterized forage-fish species and abundance in each pellet to the extent possible based on the condition of the otoliths. We compared these data against the existing diet data from Shoals in order to determine this method's practicality as a supplemental data-collection method for the larger diet study on White and Seavey islands.

Sat- 5

Should I Stay or Should I Go Now: The Effect of Site Fidelity on Breeding Success of the Leach's Storm Petrel (*Oceanodroma leucorhoa*)

Autumn Pauly (College of the Atlantic, Bar Harbor, ME) and Eleanor Gnam (College of the Atlantic, Bar Harbor, ME)

Abstract - Breeding seabirds with extended lifespans often exhibit strong mate and site fidelity. *Oceanodroma leucorhoa* (Leach's Storm Petrel) provides a model for investigating the interplay between breeding failure, mate fidelity, and breeding success. This study examined the relationship between banded-bird returns, mate fidelity, and breeding success of Leach's Storm Petrels on Great Duck Island (GDI), situated off the mid-coast of Maine. We conducted field observations over the period 2021 to 2023. The research focused on previously banded pairs, with data collection involving band numbers and breeding status, among other measured variables. Annual monitoring revealed a decline in site fidelity, with only 12% of individuals banded in 2021 returning in 2023, and 68% of burrows occupied by new individuals. Despite this, the breeding success of the colony in a given year exhibited a positive correlation with nest site and mate fidelity in the subsequent year. Among the 32 successful breeding burrows in 2023, 65.62% retained the original breeding pair from 2022, 21.87% retained 1 bird, and 12.5% had new occupants. Previous studies have shown that high rates of nest-site fidelity and mate fidelity may be an indicator of positive population status; fidelitous pairs demonstrated elevated breeding success rates. Despite the previously demonstrated advantageous correlation between fidelity and breeding success, this study unveiled an overall decline in burrow activity with regards to mate and site fidelity. The reasons behind this decline require further investigation. This research underscores the intricate dynamics of seabird breeding ecology, shedding light on the complex relationships between mate fidelity, site fidelity, and breeding success. A deeper understanding of these connections is pivotal for effective conservation strategies and the preservation of seabird populations. Further studies are essential to unravel the underlying causes of the observed decrease in burrow activity, providing valuable insights into the ecological health of these breeding seabirds.

Sat- 7

Silver-Spoon Effects of Corticosterone on Juvenile Survival of Red-tailed Hawks

Taylor Peltier (SUNY ESF, Syracuse, NY), **Cynthia J. Downs** (SUNY ESF, Syracuse, NY), **Teresa E. Ely** (Golden Gate Raptor Observatory, Sausalito, CA), and **Christopher W. Briggs** (SUNY ESF, Syracuse, NY)

Abstract - Nestling survival is influenced by many factors including nest habitat quality, food availability, quality of parents, and parental care. Stressors in the nest may have long-lasting effects on individual health and fitness. Chronically elevated corticosterone (Cort) can lead to poorer body condition and shorter lifespans. Cort extracted from feathers can represent an individual's stress during the period of feather growth. Therefore, for birds sampled as juveniles, extracted feather Cort (fCort) will provide a record of stress during the nestling and early fledgling stages. We examined the relationship between fCort and survival to adulthood of a long-lived migrant, *Buteo jamaicensis* (Red-tailed Hawk). We analyzed samples taken between August and December from 2013 to 2022 from migrant hatch-year Red-tailed Hawks whose second-year fates were known (i.e., they were either reencountered alive or recovered dead). We further classified deceased individuals into individuals that died due to starvation or due to other causes (e.g., collision with a wind turbine). In accordance with the silver-spoon hypothesis, we predicted that fCort would be lowest in those that survived, highest in individuals that died of starvation, and intermediate in birds that died of other causes. However, there was no relationship between fCort and hawk survival outcomes ($P > 0.05$). This result may indicate a lack of silver-spoon effects in Red-tailed Hawks, or perhaps that selection against individuals with high Cort levels occurs before they disperse from their natal territories.

Sat- 11

Down to the Core: Fire and Vegetation History in a Jack Pine-Dominated Ecosystem

Amélie Przedwiecki (SUNY Plattsburgh, Plattsburgh, NY), **Lydia Harvey** (SUNY Plattsburgh, Plattsburgh, NY), **David Franzl** (SUNY Plattsburgh, Plattsburgh, NY), and **Mark Lesser** (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Paleoecological studies provide insight into historical community assemblages, species migration patterns, and disturbance history (e.g., fire occurrence). Sediment cores from lakes and wetlands, provide a continuous record of how systems have changed over time. Understanding the history of an ecosystem can help to better understand potential future changes that might occur as well as help be able to manage the ecosystem. Rare ecosystems are important to study because of their unique ecological relationships and biodiversity. In addition to the species present, unique disturbance regimes are also important to understand. In northeastern North America, dominated by northern hardwood forest, fire-dependent pine barrens represent a relatively rare ecosystem shaped by disturbance regimes. The Altona Flat Rock is an ~2000-ha sandstone pavement *Pinus banksiana* (Jack Pine)-dominated pine barrens ecosystem located in northeastern New York. This pine barrens is a fire-dependent ecosystem and at the southernmost limit of Jack Pine's distribution, making it at risk from both the direct effects of climate change (i.e., warming), and changing disturbance regimes. In January 2024, we sediment-cored a wetland at the Altona Flat Rock, using a 5-cm diameter Russian Peat Corer. We collected sediment in 0.5-m segments to a depth of 3.74 m. We further separated core segments into 1-cm-thick cookies from which 1-cm³ sections were taken for loss on ignition (LOI) organic carbon analysis and pollen analysis, while the remainder was used for macrofossil identification and charcoal fragment counts. We sieved each sample to separate the plant and charcoal fragments from the sediment matrix, which we then identified and counted under a dissecting scope. Radio-carbon dating at intervals along the core will determine the dates of species occurrence/arrival and fire occurrence. Specifically, results will show when the Flat Rock became a fire-adapted Jack Pine-dominated ecosystem, the fire-return interval that has maintained the system as such, and how the system has recovered following past wildfires. Knowledge of the history and timing of these events will help to better understand and manage this ecosystem going forward.

Sun- 1

Assessment of Spatial Distribution Patterns and Infestation Risk Over Time of Spotted Lanternfly (*Lycorma delicatula*) in New York State

Alanna Richman (SUNY Albany, Albany NY)

Abstract - *Lycorma delicatula* (Spotted Lanternfly) is an invasive treehopper native to China. It was first introduced to Pennsylvania in 2014 and has expanded its range to New York state as of 2020. Their preferred host tree is the invasive *Ailanthus altissima* (Tree of Heaven), but they will feed on over 173 different plants worldwide. Preferred host species in New York state include agricultural vegetation such as grape vines and fruit trees. I analysed data on positive sightings of Spotted Lanternfly collected by the New York Department of Agriculture and Markets starting in 2021 using ArcGIS Pro to assess spatial distribution patterns. Spotted Lanternfly egg masses can be unknowingly spread via transportation pathways such as highways and railroads. Using a geographically weighted regression, proximity to these pathways was shown to be a significant factor in the location of Spotted Lanternfly sightings in New York state. Additionally, I geographically categorized infestation risk based on proximity to these transportation pathways and agricultural regions.

Sun- 8

Polymorphism Mediated Sperm Competition in *Zonotrichia albicollis* (White-Throated-Sparrow)

Isabelle M. Rubbo (SUNY ESF, Syracuse, NY), Rusty A. Gonser (Indiana State University, Terra Haute, IN), and Christopher W. Briggs (SUNY ESF, Syracuse, NY)

Abstract - Sperm competition is a taxonomically widespread form of sexual selection that results in reproductive tactics and adaptations to increase a male's reproductive success. Birds have complex mating systems that vary from strict monogamy to polygyny, making them good subjects to examine sperm competition. The polymorphic *Zonotrichia albicollis* (White-throated Sparrow) exhibits disassortative mating and is an ideal candidate for investigating the potential effects of sperm competition. White-color morph males tend to be more aggressive, initiate more attacks, and engage in more extra-pair copulations (i.e., promiscuous) than their tan-striped counterparts, which tend to demonstrate greater parental care and seek fewer extra-pair copulations (i.e. non-promiscuous). Given these color-morph differences, we sought to determine if competition and alternative reproductive tactics between males (promiscuous versus non-promiscuous behaviors) result in morphological changes in sperm size. We collected data at the Cranberry Lake Biological Station in the Adirondack Mountains during the summer of 2023. We captured breeding males in mist nests using conspecific playback. We recorded morph (i.e., tan- or white-striped), sex, age, and cloacal volume. We collected sperm from 10 individuals (3 white-striped and 7 tan-striped) and spread the samples onto slides that we examined using a compound microscope. We took pictures of 20 randomly selected individual sperm from each individual and then analyzed them using Sperm Sizer software to determine the length of the head, midpiece, tail, and total sperm. We used a mixed-effects ANOVA to examine the effects of individual and morph on sperm size. Overall, we found a significant difference ($P < 0.05$) in the length of the sperm tail, with tan-striped birds exhibiting shorter tails (7298.6 ± 655.7 um), and white striped birds exhibiting longer tails (10279 ± 2231.6 um). This suggests that competition has resulted in the selection of longer sperm tails in white-morphed males. Longer tails are associated with faster-swimming sperm and are considered the best evidence for sperm competition.

Sat- 3

Incidence of Bacterial Symbionts in the Ant-Mimicking Spider *Myrmarachne formicaria*

Anna Schell (SUNY Geneseo, Geneseo, NY), **Brenna Dunn** (SUNY Geneseo, Geneseo, NY), and Jennifer L. Apple (SUNY Geneseo, Geneseo, NY)

Abstract - *Myrmarachne formicaria* (Salticidae), an ant-mimicking spider, is originally native to Eurasia; however, it has been sighted in parts of North America since 2001. Many arthropod species, including spiders, carry maternally inherited endosymbiont bacteria, some of which have reproductive effects on their hosts. While endosymbionts have been found associated with some arachnids, we do not know if *M. formicaria* hosts any of these bacteria. Other studies have shown that some arthropods have experienced a loss of associated endosymbiont bacteria upon colonization of new regions. Previous genetic work in our lab to learn about *M. formicaria*'s introduction history found very little mitochondrial DNA genetic diversity in samples from New York, Pennsylvania, and Ohio, suggesting their arrival in North America may have involved a single colonization event. The aim of this study was to survey North American *M. formicaria* for the presence of endosymbionts. This study involves extracting DNA from collected spiders and amplifying it with endosymbiont-specific primers to test for their presence. Our study also includes comparison of endosymbiont incidence between North American spiders and a limited sample of spiders collected in Europe. We focused on *Wolbachia*, *Cardinium*, and *Rickettsia*, which are the most common endosymbionts found in related spiders. Our preliminary data suggest that *M. formicaria* carries both *Wolbachia* and *Cardinium* endosymbionts. However, the presence of *Rickettsia* has yet to be confirmed. Understanding which endosymbionts are present will give further insight as to the effects they could have on the reproduction of *M. formicaria* as well as whether range expansion has consequences for endosymbiont incidence. This study will also contribute to our understanding of patterns in associated endosymbiont bacteria in spiders.

Sun- 36

Easy Come, Easy Go: Temporal Variation in a Remote Intertidal Community

Marina A. Schnell (College of the Atlantic, Bar Harbor, ME)

Abstract - Mount Desert Rock (MDR; 43.97°N, 68.13°W) is a 1.2-ha island 40 km off the Maine coast. The ecological setting of MDR is unique due to its distance from the mainland, its high-energy shoreline, and its breeding colony of *Larus argentatus* (Herring Gull) and *Larus marinus* (Great Black-backed Gull). Since 2017, researchers and students have conducted an annual intertidal survey on MDR using the protocol developed by the Northeast Coastal Station Alliance (NeCSA). This protocol is used by 10 field stations, including both island and coastal stations. MDR is the farthest offshore NeCSA site (over twice as far as the next most remote site). In addition to the annual survey, there is a temperature sensor installed at the mid-tide point, so it is possible to determine trends in both air and water temperature. Initial forays into the NeCSA survey data indicate that compared to the much larger and closer inshore Mount Desert Island (MDI), native *Littorina saxatilis* (Rough Periwinkle) and *Littorina obtusata* (Smooth Periwinkle) are notably more abundant, and the introduced *Littorina littorea* (Common Periwinkle) are much less abundant. However, the populations of these snails on MDR vary from year to year. One plausible explanation for the variation in populations is the high-disturbance habitat in which these organisms live, which may lead to large annual shifts in species composition. Trophic interactions may magnify this variation; e.g., if the gulls of MDR were to shift their diet to consume more intertidal crabs than bait from fishing boats, populations of periwinkle snails (prey for some crab species) might increase. Further study will be necessary to understand the links between these possible causes and the variations in community structure on MDR.

Sat- 46

Impacts of Road Closures on Migratory Amphibian Mortality During Spring Migration in Keene, New Hampshire

Taylor Seidel (Antioch University New England, Keene, NH), **Rachel Thiet** (Antioch University New England, Keene, NH), and **Brett Amy Thelen** (Harris Center for Conservation Education, Hancock, NH)

Abstract - Amphibians are an important part of biological diversity and are considered an indicator species in many ecosystems. Unfortunately, amphibians are some of the fastest disappearing species in the world due to several factors, including human development; habitat fragmentation is particularly problematic for migratory amphibians because they need to travel from their overwintering locations to wetlands to breed. Many of the migration routes these species have relied on for generations have been fragmented by road construction, which puts migratory amphibians at an increased risk of mortality due to motor vehicles. On rainy spring nights in New England (“big nights”), amphibians emerge and travel to their breeding habitats. Various programs around the world assist amphibians with this journey; one such program is the Salamander Crossing Brigade (SCB) managed by the Harris Center for Conservation Education in Hancock, NH. In the 17 years the project has been active in southwestern New Hampshire, SCB volunteers have steered >75,000 amphibians, including *Ambystoma maculatum* (Spotted Salamander), *Ambystoma laterale-jeffersonianum* (Jefferson complex salamanders; a species of special concern in NH), *Lithobates sylvaticus* (Wood Frog), and *Pseudacris crucifer* (Spring Peeper), away from the dangers of motor vehicles and safely to their breeding pools. More recently, the Harris Center has worked with the City of Keene, NH, to close 2 highly trafficked (by both cars and amphibians) roads on “big nights” to reduce amphibian mortality. The overall goal of my project is to determine if there is a relationship between road closures and amphibian mortality in Keene. Preliminary data suggest closing roads has reduced amphibian mortality by over 50% on “big nights”. I will share the results of full data analyses in this poster. Our results will be of interest to the City of Keene, NH, the Harris Center for Conservation Education, herpetologists, conservation biologists, and road ecologists.

Sat- 22

Investigating Spread Rates of Aquatic Invasive Plant Species in North America

Katrina Shepard (SUNY Geneseo, Geneseo, NY), **Morgan LaDue** (SUNY Geneseo, Geneseo, NY), **Ada Roe** (SUNY Geneseo, Geneseo, NY), and **Suann Yang** (SUNY Geneseo, Geneseo, NY)

Abstract - Aquatic invasive species have detrimental effects on the ecosystems of the northeastern United States and eastern Canada. Aquatic plants can create dense mats in lakes which pose concerns for lake managers, like blocking sunlight for native species and impeding boat travel. Watercraft are well-known for transporting aquatic plants that reproduce asexually and spread through fragmentation to other lakes and streams. Characterizing the patterns of invasion for aquatic invasive species can be important for making local management decisions to control them. We focused on *Najas minor* (Brittle Waterlily), *Hydrilla verticillata* (Hydrilla), and *Nitellopsis obtusa* (Starry Stonewort), which disperse through fragments transported by boats and form dense mats. To characterize their patterns of invasion, we estimated our species’ ranges and rates of spread, then compared these rates. We first compiled occurrence records of *N. minor*, *H. verticillata*, and *N. obtusa* from the online databases GBIF, iDigBio, and iMapInvasives. We then used QGIS to estimate the range, at different intervals of time, for each species since their arrival in North America. These ranges include lake surface area only. Finally, we calculated the spread rates and performed a linear regression analysis to compare them using the R Programming Environment. Our preliminary results showed that all 3 species have spread at the same rate. In addition, the range of *H. verticillata* is ~71.8 km², while the ranges of *N. minor* and *N. obtusa* are roughly 20x and 60x that of *H. verticillata*, respectively. *Hydrilla verticillata* has been identified as a local problem by several municipalities and has had extensive removal efforts, potentially contributing to its smaller range, despite having the same spread rate as the other species. Rates of spread and ranges can inform patterns of invasion, which can be used to predict locations at risk of invasion and allow lake managers to implement prevention policies. Spread rates at areas of co-occurrence could be useful in future studies of invasional meltdown.

Sun- 16

The Effects of the Total Solar Eclipse on the Acoustic Environment in Northern NY

Kelsey A Simler (St. Lawrence University, Canton, NY), **Jessica Harman** (St. Lawrence University, Canton, NY), Evelyn R. Albrecht (St. Lawrence University, Canton, NY), Matt Higham (St. Lawrence University, Canton, NY), and Erika Barthelme (St. Lawrence University, Canton, NY)

Abstract - Because total solar eclipses are infrequent in specific locations, we know very little about how wildlife respond to eclipse conditions. We will take advantage of the 8 April 2024 total solar eclipse as an opportunity to study changes in acoustic ecology. We will place pairs of automated recording devices around St. Lawrence County, NY set to record for several days leading up to, during, and for several days immediately after the total solar eclipse. We expected to hear an increase in nocturnal sounds and decrease in diurnal sounds during the period of the eclipse. Here we present the preliminary results of the changes we observed.

Sun- 41

A Survey of Infestations of Lily Leaf Beetle on Populations of Wild Lilies in St. Lawrence County, NY

Paul Siskind (Master Naturalist, Norwood, NY; paul@paulsiskind.com)

Abstract - *Lilium canadense* (Canada Lily) is the most widespread native lily in northeastern North America. It's the only native lily that's common throughout the North Country region of New York, although it's usually found in sparse populations. Canada Lily is susceptible to infestation by *Lilioceris lili* (Lily Leaf Beetle), an invasive from Eurasia. Lily Leaf Beetle feeds and breeds almost exclusively on *Lilium*. Since the 1990s, the beetle has spread from New England across the northern US and southern Canada. The beetle infests both non-native lilies in gardens as well as native *Lilium* species in the wild. There are no known natural predators of the beetle in North America. Three species of parasitoid wasps have been imported to control the beetle, released in the Northeast beginning in 1999. However, the spread of beetle infestations far outpaces the spread of the parasitoids; this poses a potential threat of extirpation of small populations of native lilies. Between 2018 and 2022, I conducted a survey to locate wild populations of lilies throughout St. Lawrence County, NY. I found and monitored ~40 populations for the spread and levels of infestation by the beetle. I observed that the beetle doesn't infest wild populations of native lilies as intensely as it infests garden populations of hybrid lilies derived from Eurasian species, and that the level of infestation of a single population can wax and wane from year to year. I also observed the impacts of other threats to the lilies, including changes of weather and other growing conditions, browsing and trampling by deer, and anthropogenic activities such as mowing of roadsides and larger habitat destruction. The levels of infestation and the overall health of the populations appear to be influenced by a complex combination of all these factors, mediated by particular aspects of the lifecycles of both the lilies and the beetles. The interaction of the beetle's univoltine lifecycle combines with the lily's ability to persist as colonies of immature plants to suggest that many populations of native lilies will be able to survive infestation by the beetle until the wasps become established widely.

Sat- 42

Evaluating the Role of Arboreta in Emerging Invasive Plant Introductions: Insights from Vassar College

Ethan Skuches (Vassar College, Poughkeepsie, NY), **Keri VanCamp** (Vassar College, Poughkeepsie, NY), and **Jennifer Rubbo** (Vassar College, Poughkeepsie, NY)

Abstract - Arboreta, known for their diverse and novel collections, pose a unique risk for the spread of invasive species. This research explored the connection of arboreta and invasive species spread using Vassar College as a case study. We cross-referenced the list of species present in the Vassar Arboretum (VA) with the Lower Hudson Partnership for Regional Invasive Species Management (LHPRISM) invasive species classification list. We found that 33 of the species planted in the VA are present on this list (20%), and 17 of the species in the VA are considered to be emerging invasive species (10%). We are in the unique position of having The Preserve at Vassar (PaV), a 202-ha (500-ac) ecological preserve, adjacent to the VA, allowing us to actively manage and monitor for invasive species spread. In the summer of 2023, we conducted a systematic grid survey across the PaV for emerging and common invasive species. We found 15 invasive species that are cross-listed from the LHPRISM and VA lists, 2 of which are emerging invasive species, volunteering on the PaV. In addition to spreading to the PaV, 5 emerging invasive species have been found volunteering within the VA beyond their original planting. Through this research we document the threat that many arboreta, and specifically the VA, pose against native biodiversity by acting as launchpads for the spread of emerging invasive species on local and regional scales. National and regional regulations prohibit the spread and sale of certain species, but for institutions such as arboreta, there is a lack of uniform risk assessment and management protocols in place for how to discuss and manage species selections and pre-existing invasive living collections. If we only manage these issues on the PaV and are not confronting the problem on campus, there is no true impact as the seed source is still active. Beginning steps at the VA have been taken to eradicate emerging invasive species from living collections. We recommend the adoption and implementation of voluntary codes of conduct for arboreta and all sources of non-native plant materials in order to mitigate the spread and impacts of invasive species.

Sun- 14

Flying Insect Diversity and Abundance at Cliff Swallow Colony Sites in Western Massachusetts

Sarah Snyder (Bard College at Simon's Rock, Great Barrington, MA), **Mara Silver** (Independent Researcher, Shelburne Falls, MA), **Linda Merry** (Berkshire Community College, Pittsfield, MA), **Jillian Heath** (Bard College at Simon's Rock, Great Barrington, MA), **Sophie Salisbury** (Bard College at Simon's Rock, Great Barrington, MA), and **Stavroula Skandalakis** (Bard College at Simon's Rock, Great Barrington, MA)

Abstract - *Petrochelidon pyrrhonota* (Cliff Swallow) is an aerial insectivore bird species that nests in colonies, often on human-made structures in open habitat. The size of Cliff Swallow colonies fluctuates from year to year and the average number of nesting birds varies widely among colony sites. This variability in colony size is poorly understood. In a study in Nebraska, the ecological characteristic most strongly associated with Cliff Swallow colony size at a site was the type of nesting substrate, while another study found that colony size increased with an increase in land-use diversity and possibly extent of water near a site. We hypothesized that Cliff Swallow colonies would be larger at sites where their insect prey was more abundant and more diverse. We monitored colonies at several sites to estimate number of breeding birds and used malaise traps to capture a sample of flying insects at each site during 3 sampling periods. Insects were sorted to order, counted, and weighed to determine biomass and diversity at each site. We found little variation in insect diversity and biomass across sites, but Cliff Swallow colony sizes varied across sites with 1 site being substantially larger than the others. The largest sample of flies in the Nematocera suborder, which are high in omega-3 fatty acids, was collected during the nestling period at the largest Cliff Swallow colony. We plan to continue this monitoring effort in future years to help us better understand Cliff Swallow population dynamics.

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Sat- 1

Anas platyrhynchos (Mallard) in the Atlantic Flyway: Deriving Migration Metrics from GPS/GSM Data

Daria Sparks (SUNY Brockport, Brockport, NY), Jacob Straub (SUNY Brockport, Brockport, NY), J. Stiller (New York State Department of Environmental Conservation, Albany, NY), M. Weegman (University of Saskatchewan, Saskatoon, SK), C. Waldrep (University of Saskatchewan, Saskatoon, SK), J. Coluccy (Ducks Unlimited Inc., Dexter, MI), and A. Hoyt (Pennsylvania Game Commission, Harrisburg, PA)

Abstract - *Anas platyrhynchos* (Mallard) breeding abundance surveys show differential rates of population decline across the Atlantic Flyway. The breeding population in the Northern Atlantic Flyway (NAF), which encompasses Eastern Canada and Maine, has remained relatively stable while the population in the Southern Atlantic Flyway (SAF), located in the northeastern US, has declined by an average of 1.6% annually since 1998. We initiated a multi-year (2022–2026) study to capture female Mallards then affix Ornitela GPS/GSM communication transmitters on them to better understand potential drivers of these disparate trends. Using hourly GPS locations, we compared the migration metrics of breeding Mallards by location (NAF and SAF) and by age classes (second year [SY] and after second year [ASY]). We used a ruleset to define stages of the annual cycle for each individual bird including wintering, migration, and breeding seasons. Preliminary results from an ANOVA on 215 birds during spring migration and 140 during fall migration indicated that Mallards that bred in the NAF ($n = 137$) initiate spring migration an average of 6 days sooner ($P = 0.005$) and terminate migrations an average of 12 days later ($P < 0.001$) than those that bred in the SAF ($n = 92$). Additionally, NAF birds ($n = 95$) initiate fall migration an average of 17 days earlier ($P = 0.002$) than SAF birds ($n = 62$), but there is not a significant difference in the termination of fall migration ($P > 0.05$). Timing only varied between SY ($n = 119$) and ASY ($n = 110$) groups for spring migration. There was no significant effect of age on initiation of spring migration ($P = 0.057$), however, ASY birds terminated migration 11 days sooner on average than SY birds ($P < 0.001$). As a population, spring migration occurred from February 21 to June 2, and fall migration occurred from August 1 to January 17. On average, Mallards spent 25 days in spring migration and traveled 740 km, while in the fall they traveled an average of 633 km over 27 days. Our empirical summaries of migration metrics can better inform managers who seek to determine the best times and locations to estimate population sizes of Atlantic Flyway mallards and will help us build a full annual cycle model for Mallard's management in eastern North America.

Sat- 12

Archiving Fieldwork for the Future: Sharing Your Research with Museum Collections

Michelle Tang (Museum of Comparative Zoology, Cambridge, MA)

Abstract - With >1 billion specimens held in more than 1000 institutions worldwide, natural history museums represent hundreds of years of biodiversity through contributions from zoologists, naturalists, and other researchers. To increase accessibility and utility, museum collections are pursuing large-scale digitization efforts of specimen data, published publicly on institutional databases (e.g., MCZbase) and collaborative data aggregates (e.g., GBIF). This poster discusses recommended field/lab practices to optimize the research value of archived specimens and streamline the process of receiving and digitizing new material. Additionally, I provide a brief overview of collections work and museum–research collaborations. Regarding the importance of vouchering and citing specimens, I highlight the concept of the Digital Extended Specimen Network, created by capturing and linking specimen-based data to specimen-derived and specimen-affiliated data (e.g., publications, genetic sequences, scans, and more).

Sun- 46

Fishing Activity has Minor Effects on Earthworm Communities Adjacent to Central New York Freshwater Habitats

Adam M. Thomas (Utica University, Utica NY), **Dominic G. Clark** (Utica University, Utica NY), Nathan E. Rice (Utica University, Utica NY), Timothy S. McCay (Colgate University, Hamilton, NY), Brianna G. Santos (Utica University, Utica NY), Peyton N. Walker (Utica University, Utica NY), Chanel Chahfe (Utica University, Utica NY), and Sara E. Scanga (Utica University, Utica NY)

Abstract - The glaciation events of the Pleistocene left many habitats in the northern hemisphere devoid of earthworms. However, anthropogenic activities have since facilitated the spread of exotic earthworm species to these previously glaciated areas, where some have had detrimental effects on North American ecosystems. As these exotic species continue to expand their range, it is crucial to understand the mechanisms by which they disperse through ecosystems and landscapes. One mechanism that likely facilitates the distribution of exotic earthworms is the use of earthworms as fishing bait. In October 2023, we used spicy mustard vermifuge to survey earthworm density, biomass, and species richness at fishing-access points and paired non-fishing areas adjacent to 13 freshwater habitats in central New York. We found no significant differences in earthworm density, biomass, or species richness between the fishing and non-fishing areas, which also had similar species composition. Species of jumping worms, including *Amyntas* and *Metaphire* spp., which are currently expanding their range, showed no difference in density or biomass between the fishing and non-fishing areas. However the density of *Lumbricus* spp. (nightcrawlers), which are commonly used as bait worms, was about twice as high in fishing areas than in non-fishing areas. These results suggest that fishing activities may change the local abundance of exotic earthworms used for bait, but have little to no effect on the range expansion of exotic earthworms that are not typically used for bait.

Sun- 9

Patterns of Plant Species Introductions in Lake Ontario Coastal Wetlands

Kendalyn Town (SUNY Brockport, Brockport, NY) and Rachel Schultz (SUNY Brockport, Brockport, NY)

Abstract - Great Lakes coastal wetlands face a variety of anthropogenic impacts that degrade wetland quality and limit their ability to provide valuable ecosystem services. Since European settlement, two-thirds of coastal wetland area has been lost, and a prominent threat to the remaining wetlands are plant species invasions. Using a dataset spanning 154 Lake Ontario coastal wetlands collected by the Great Lakes Coastal Wetland Monitoring Program from 2011 to 2023, we will highlight broad patterns in plant-species introductions, including changes in the relative richness and abundance of introduced species across Lake Ontario wetlands throughout the sampling period. We will be able to highlight the wetland sites that have experienced the greatest amounts of species introductions, along with the sites with the fewest introduced species. We will also group the sites by hydrogeomorphic class to determine whether lacustrine, riverine, and barrier-protected coastal wetlands differ from one another in relative richness and abundance of introduced plant species over the study period. By providing insight to the extent of species introductions across Lake Ontario wetlands and how it has changed, this analysis can be used to inform wetland restoration and management.

Sat- 16

In the Heat of the Moment: Fine-Scale Temperature Differences Across a Topographically Complex Jack Pine Barrens

Taylor Towne (SUNY Plattsburgh, Plattsburgh, NY), **James Wholey** (SUNY Plattsburgh, Plattsburgh, NY), **Meghan Bargabos** (SUNY Plattsburgh, Plattsburgh, NY), and **Mark Lesser** (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Fine-scale temperature differences have a potentially strong influence on forest composition, regeneration, and growth. Small changes in elevation, aspect, and slope may lead to variation in site suitability at spatial scales not usually studied. This variation may be especially important where species are at, or near, their range margins and are more vulnerable to temperature changes, particularly as seedlings. The Altona Flat Rock, an isolated sandstone pavement pine barrens in Northeastern United States, contains ~2000 ha of *Pinus banksiana* (Jack Pine)-dominated forest surrounded by northern hardwood forest. Jack Pine is a serotinous species, meaning its cones open under extreme heat or pressure and its seeds germinate best when wildfires remove the competing understory vegetation and expose mineral soils. However, at the Flat Rock, located at the southern range-limit of Jack Pine, rising temperatures may be creating unfavorable conditions for seedling survival and growth. To study the relationship between fine-scale temperature and topography at the Flat Rock, we established a network of twenty 1-km² grid-cells spanning the Flat Rock and surrounding hardwood forest. We positioned Ibutton temperature sensors in the center of each grid cell to monitor temperature every 4 hours beginning on 10 November 2022 and operating continuously until 4 February 2024. We calculated daily minimum, maximum, and mean temperature for each sensor and used a 1-m resolution digital elevation model (DEM) to determine elevation, aspect, and slope at each location. Preliminary results show that Ibutton elevations varied from 170 to 305 m, and that average temperatures varied from 6.2 to 11.2 °C. Minimum and maximum temperatures varied from -24.4 to -9.8 °C and 23.3 to 28.3 °C, respectively. We will model temperature against topographic variables to determine the influence of topography on fine-scale temperature variation. Despite recent research showing high resiliency, rising atmospheric temperatures may begin to affect seedling success. These effects may be exacerbated, or mitigated, by topographic position through differences in such factors as sun exposure or moisture retention. Better understanding of these fine-scale processes is vital for management of Jack Pine at its southern range-limit in the face of global warming.

Sun- 5

Is Microbe-Assisted Resistance to Grey Mold Cultivar-Dependent?

Helen Vaughan (Middlebury College, Middlebury, VT), **Zoe Smutko** (Loyola University Chicago, Chicago, IL), **Emily Burgess** (Utah State University, Logan, UT), **Sagar Jadhav** (Utah State University, Logan, UT), **Monica Borghi** (Utah State University, Logan, UT), **Jennifer Reeve** (Utah State University, Logan, UT), and **Robert Schaeffer** (Utah State University, Logan, UT)

Abstract - Mold causes major losses of produce post-harvest and leads to unnecessary food waste. A common fungus that results in the rejection of produce post-harvest is *Botrytis cinerea*, which causes gray mold. Microbial biological control agents (mBCA), such as the fungus *Aureobasidium pullulans*, have shown promise as a sustainable tool for management of gray mold in strawberries and other crops; however, its efficacy can be variable and may depend upon plant genotype, among other factors. Here, we evaluated *A. pullulans* efficacy against *B. cinerea* across 9 strawberry cultivars, using a leaf-disk assay. We further examined the potential mechanism underlying variation in efficacy, hypothesizing that *A. pullulans* would prime the host immune system and affect expression of pathogenesis-related proteins (PR-proteins: -1,3-glucanase and chitinase). *Aureobasidium pullulans* proved to be effective in limiting gray mold growth, reducing disease severity. Preliminary analyses of -1,3-glucanase and chitinase gene transcripts also indicate elevated expression following treatment with *A. pullulans*, with variation coinciding with patterns observed in the leaf-disk assay. These data suggest priming of host defenses and associated resistance as an important mechanism driving microbe-mediated protection of crops. Greater consideration should be given, however, to mBCA-cultivar interactions in the screening, development, and adoption of these products for consistent disease control. Our hypothesis was correct, with greater variance in mold growth and PR-protein expression between cultivars. We propose further research into this phenomenon, as it has significant implications for produce production and transport.

Sun- 40

The Vegetation of Two Gull Colonies on Great Duck Island in the Gulf of Maine

Francisco L. Vazquez (College of the Atlantic, Bar Harbor, ME)

Abstract - Great Duck Island is a 91-ha island located 15 km south of Mount Desert Island in Hancock County, ME. Two mixed nesting colonies of *Larus smithsonianus* (Herring Gull) and *Larus marinus* (Black-backed Gull) have been established on Great Duck Island since prior to 1989. As of this time, the number of nesting gulls in the northernmost of these colonies has been generally declining, and the southernmost has been increasing since 1999. The selection of nest sites in vegetated areas each spring is expected to be uneven and reflective of gull nesting preferences, and as nesting becomes denser, the distribution of vegetation may reflect an increasingly gull-derived impact from frequent trampling and guano deposition. I surveyed forty-five 0.5-m² plots in both colonies, divided into low and high nesting-density areas based on kernel density estimation. I also surveyed an equal number of plots were in meadow areas with no current gull nests in a convex hull around each colony. In total, I surveyed 90 plots between both colonies. Ultimately, nesting density, along with other factors, was found to be correlative with certain vegetative assemblages.

Sat- 6

Spatiotemporal Trends in Asian Shore Crab Abundance across Southern New England

Kimberly M. Waller (Bridgewater State University, Bridgewater, MA), Mallory J. Morrison (Bridgewater State University, Bridgewater, MA), Myra M. Dehestani (Bridgewater State University, Bridgewater, MA), and Christopher P. Bloch (Bridgewater State University, Bridgewater, MA)

Abstract - Invasive species thrive in environments with high prey availability and few predators or competitors. *Hemigrapsus sanguineus* (Asian Shore Crab) was first observed on the US east coast in 1988 at Cape May, NJ, and had reached northern Cape Cod by the mid-1990s. Here, the Asian Shore Crab population flourished, while both the prey *Mytilus edulis* (Blue Mussel) and competitor *Carcinus maenas* (Green Crab) rapidly declined. This study investigates spatiotemporal variation in abundances of these species from 2014 to 2023 to determine whether long-term observations on Cape Cod are consistent with a broader-scale regional pattern or represent an idiosyncratic response at a single site. Spatiotemporal variation was extensive, making generalization difficult. Asian Shore Crab abundances did not exhibit a consistent trend in density over time. Sites north of Cape Cod exhibited greater mean abundance of Blue Mussels, although abundance varied greatly over time and between sites. At sites south of Cape Cod, evidence suggests predator-prey cycling between the Asian Shore Crab and the Blue Mussel. Abundances of the Green Crab remained low at all sites throughout the study. These differences suggest site-specific variables overwhelm regional patterns in population dynamics of these species. Further study is needed to evaluate the effects of biogeographic variables, climatic conditions, and abundances of alternative prey on life-history, reproductive success, and consequent variability in abundance of Asian Shore Crabs.

Sun- 45

The Wild Connection: Small-Mammal Abundance as a Predictor for Tick-Borne Diseases

Jada West (State University of New York at Potsdam, Potsdam, NY), Kate Cleary (State University of New York at Potsdam, Potsdam, NY), and Glenn Johnson (State University of New York at Potsdam, Potsdam, NY)

Abstract - Small mammals play a vital role in the functioning of an ecosystem and impact human health as they are reservoir hosts for more than 80 zoonotic diseases worldwide including Lyme, anaplasmosis, and babesiosis. In this project, we tested for relationships between small-mammal relative abundance, the relative abundance of ticks, and the percent of ticks positive for 3 tick-borne diseases, and evaluated whether these patterns changed across rural, urban, and interface regions throughout Potsdam, NY. In each type of region, we randomly selected 5 sites and set 4 Sherman traps and 2 pitfall traps at each site. We checked the traps once a day for 10 days in a row in June, July, and August of 2023. We also dragged for ticks at each site 3 separate times, following standard protocols. This resulted in the capture of 240 total small mammals, of which 188 represented 1 of the 3 species that are the main carriers of Lyme, anaplasmosis, and babesiosis: *Peromyscus* spp. (deer mice), *Tamias striatus* (Eastern Chipmunk), and *Blarina brevicauda* (Northern Short-tailed Shrew). Preliminary data analysis shows the total number of carriers is not a significant predictor of the number of ticks ($P = 0.445$) but is a significant predictor of the number of ticks positive for Lyme ($P = 0.043$).

Sat- 44

Sizing It Up: Using LiDAR Imaging to Map Forest Structure at the Altona Flat Rock

James Wholey (SUNY Plattsburgh, Plattsburgh, NY), Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY), Mark Baran (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - The use of LiDAR imaging in the field of forest ecology has allowed researchers to quickly and accurately map forest structure, determine biodiversity, and aid in forest measurements such as basal area and tree height, along with many other useful applications. Our study area, the Altona Flat Rock, is a sandstone pavement pine barrens in northeastern New York dominated by *Pinus banksiana* (Jack Pine), a fire-dependent serotinous species, and an understory composed primarily of *Vaccinium augustifolium* (Lowbush Blueberry) and *Gaylussacia baccata* (Black Huckleberry). The Flat Rock barrens is surrounded by northern hardwood forest making it a unique habitat type for both wildlife and bird species. Within the pine barrens, wildfires have occurred in different areas in 1919, 1940, 1957, and 2018, which, along with silvicultural practices in 1998, have created a mosaic of stand ages (104, 83, 66, 5, and 25 years old, respectively), and corresponding changes in structural attributes, across the ecosystem. Our objective was to use LiDAR imagery to create a canopy height model (CHM) and use this model to map the encroachment of hardwood species and coniferous species other than Jack Pine into the pine barrens. We ground-truthed our models using tree heights collected from over 60 forest-structure plots spanning the Flat Rock. With data from those plots, we interpolated height as a continuous surface across the Flat Rock using kriging spatial interpolation methods in ESRI ArcPro. We will compare LiDAR generated models to the kriging models built using the plot data, allowing us to assess the accuracy of the kriged models. Having accurate tree-height models can help determine ecosystem function and aid in future management practices. It can also aid in calculating other forest measurements such as total biomass and aboveground carbon stock.

Sat- 36

Tracking Biofluorescence Over Time in the Red-Backed Salamander (*Plethodon cinereus*)

Rachael Wolf (SUNY Oneonta, Oneonta, NY), Wesley Bernard (SUNY Oneonta, Oneonta, NY), and Elizabeth Bastiaans (SUNY Oneonta, Oneonta, NY)

Abstract - Recent research has revealed biofluorescence in many species of amphibians, but its function is unknown in most species where it has been documented. *Plethodon cinereus* (Red-Backed Salamander) is an abundant inhabitant of Northeastern North American woodlands. Previous work has shown that *P. cinereus* exhibits biofluorescence on its ventral surface that appears to be brighter in males than in females. However, studies have yet to address how biofluorescence develops or changes over time in individual salamanders, information which may provide important clues to its function. We used images from salamanders captured as part of a long-term capture–mark–recapture study on 6 cover-board plots to correlate levels and patterns of fluorescence with length, mass, tail size, reproductive status, and body condition. Our work adds to the growing body of knowledge regarding biofluorescence by taking advantage of our ability to track individual animals across and within seasons and years.

Sun- 25

Patterns of Beaver Dam Abundance and Density in Central New York over the Past Three Decades Inferred from Aerial Imagery

Aidan E. Woods (Colgate University Department of Geography, Hamilton, NY), Mike Loranty (Department of Biology and Environmental Studies Program, Colgate University, Hamilton, NY), and Tim McCay (Department of Biology and Environmental Studies Program, Colgate University, Hamilton, NY)

Abstract - Using aerial imagery published in 1994, 2003, 2013, and 2022, we identified and marked the locations of dams built by *Castor canadensis* (North American Beaver) along streams and on ponds in Madison and Oneida Counties in New York to examine their abundance, spatial distribution, and the changes therein over that timeframe. We assigned each dam a numeric code that signified the year or years in which it was present, gathered dam counts by selection according to these codes, and characterized changes in the distribution of dams in relation to a series of related landscape and land-use characteristics. We overlaid the dam data with hydrologic data and census blocks from the year 2020 to explore the dams' spatiotemporal relationships with waterway characteristics and human population density. Our findings indicate that the starkest changes in dam density happen in a select few subwatersheds and census blocks, affirming that despite their ability to live near and among humans, Beavers thrive farther from dense human settlements, and that there is a complex web of determinants at play. Moreover, we used existing land-cover data to investigate further clues about environmental factors that may affect the concentration and distribution of the dams. Our results align previous findings, showing that as the Beaver population has grown, so have the abundance of dams in these 2 Central New York counties, especially near existing dams and in woody, emergent wetlands. We also provide a database for a region for which there is no current catalogue of beaver dams, opening gateways to more regional investigations but also aggregated larger-scale studies.