

June 21, 2017

Ms. Caroline Ehrlich
Greenable Woodbridge
1 Main Street
Woodbridge, NJ 07095

**Re: Ernest L. Oros Wildlife Preserve BioBlitz
2017 Report**

Dear Caroline,

This letter report summarizes the Ernest L. Oros Wildlife Preserve BioBlitz that occurred on June 2-3, 2017, in collaboration with Woodbridge Township and the Rutgers Cooperative Extension's Wildlife Conservation and Management Program. The objectives of the BioBlitz were to: 1) perform a biological inventory of the Preserve in a 24-hour period; and 2) provide nature-based educational opportunities for members of the Woodbridge Township community.

In summary, 21 scientists from Rutgers University including faculty, staff, graduate students, and undergraduates identified 388 species of birds, mammals, fish, amphibians, reptiles, insects, fungi, plants, and other organisms. Species were identified in the field, or at a large tented area (Base Camp) containing computers, field guides, microscopes, hand lenses, sorting jars, and plant presses. Some of the scientists camped in the Preserve as well, to perform night surveys and continue processing specimens.

On Saturday, June 3rd, BioBlitz staff conducted 11 nature-based walks and talks, as well as all-day events such as bird house painting and a nature themed scavenger hunt. In addition, a variety of organizations provided table displays, including the Rutgers Wildlife Conservation and Management Program, New Jersey Mycological Association, Sustainable Jersey, Woodbridge River Watch, Woodbridge Township Environmental Commission, and The Forest Fire Service administered by the NJ Division of Parks and Forestry.

Survey Results

Bird Survey

We identified 51 avian species within the Preserve during the 24-hour period. Formal bird surveys occurred in the late afternoon on Friday and early morning Saturday. In addition, our staff recorded all other species observed opportunistically throughout the event. Species of interest included the black-crowned night heron (*Nycticorax nycticorax*) and osprey (*Pandion haliaetus*), which are both listed as threatened species under the New Jersey Division of Fish and Wildlife's Endangered and Nongame Species Program. Five avian species observed are

classified as species of special concern in New Jersey, including the great blue heron (*Ardea herodias*), northern parula (*Parula americana*), snowy egret (*Egretta thula*), spotted sandpiper (*Actitis macularius*), and wood thrush (*Hylocichla mustelina*).

Bat Survey

On the evening of June 2nd from 7:30pm to 6:00am, we conducted a passive bat acoustical survey using two Pettersson D500X bat detectors and one Wildlife Acoustics Song Meter SM2BAT+ bat detector. Bats use echolocation to navigate and catch flying insects at night. We recorded these high frequency echolocation calls using the above-referenced specialized acoustic monitors, then analyzed them with bat call analysis software (Sonobat 3.1.4 NNE) to determine which species were present.

Over the entire monitoring period, we recorded a total of 199 bat calls (series of ultrasonic pulses with a minimum of 5 seconds in duration) and confirmed the identify of three species: big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*) and hoary bat (*Lasiurus cinerus*). Big brown bats are common across North America and are well adapted for occupying man-made structures. Eastern red bats and hoary bats are tree dwelling bats that spend their summers in New Jersey and migrate south during the colder months. Our acoustic monitors also detected that evening bats (*Nycticeius humeralis*) were present. This species is not common to New Jersey, although it has been confirmed occasionally in the state. The echolocation call structure of evening bats overlaps heavily with other high-frequency bat species, so it is difficult to say with certainty if this bat actually occurs in the Preserve without physically catching a voucher specimen through mist-netting operations. We did not observe any bats utilizing the bat roost boxes within the Preserve.

Mammal Survey

We identified eight mammal species (excluding bats) using three survey methods: Sherman live traps, camera traps, and a track pad. We deployed 18 Sherman live traps at dusk throughout the meadow and forest of the Preserve and baited them with a mixture of peanut butter and oats. We checked the traps at 5:00am, but unfortunately did not catch any species using this method. We also deployed three camera traps from dusk until 5:00am, with two in the forest and one near the small ponds. The cameras were calibrated to take a picture when triggered by movement in front of the lens. Using this method, we documented red fox (*Vulpes vulpes*), white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), and domestic cat (*Felis catus*). Last, we set one track pad by spreading out a layer of fine white play sand within a 2 x 2 foot area, near a trail that had evidence of wildlife traffic. At 6:00am, we identified red fox and domestic cat tracks in the sand. Other mammals were incidentally seen throughout the BioBlitz, including ground hog (*Marmota monax*), eastern cottontail (*Sylvilagus floridanus*), eastern gray squirrel (*Sciurus carolinensis*), and an unidentified mouse species (*Mus* sp.).

Fish Survey

We identified nine species of fish in the Preserve using a seine net, which is a vertical net attached to a pole on either end, with buoys on the top to keep it afloat, and weights on the

bottom. Two scientists wearing rubber chest waders dragged or ‘swept’ the 6-foot long 3/18th inch mesh seine through the two small ponds west of Woodpecker Trail. Anything caught in the net was brought to the surface for identification. The ponds were swept multiple times until no new species were observed in several consecutive sweeps. The larger Fresh Meadows Pond was too deep and turbid to perform this method, so it was not surveyed. One species of interest was the American eel (*Anguilla rostrata*), which has a complex life cycle. This species is found in a variety of fresh water habitats along the east coast of the United States, where it spends up to 25 years maturing. Individuals then migrate to the Sargasso Sea in the North Atlantic to spawn. This connection between inland fresh water to the Atlantic Ocean is crucial for the American eel’s life cycle. Water bodies within the Preserve are not considered to be connected to rivers; therefore, it is unclear how the eels came to be present at the Preserve.

Reptile and Amphibian Survey

From 11:30pm – 1:00am Friday evening, we performed a survey of the streams, wetlands, and water bodies in the Preserve to see or hear frog species. We documented green frog (*Lithobates clamitans*) and American bullfrog (*Lithobates catesbeianus*), both of which are common species in New Jersey. We incidentally saw eastern box turtle (*Terrapene carolina carolina*), snapping turtle (*Chelydra serpentina*) and painted turtle (*Chrysemys picta*) during the BioBlitz as well. We found no salamanders.

Arthropods

With the help of seven scientists, we identified 142 arthropod species during the BioBlitz. Intensive surveys were performed specifically to identify spiders, bees, butterflies, and night flying moths using beat sheets, nets, and visual observations. On Friday evening, we performed a moth survey using a mercury vapor lamp and white drop cloth and identified 65 species. Highlights included the 4-spotted palpita (*Palpita quadristigmalis*), a species that appears to be expanding its range northward in response to climate change; and the crowned Phlyctaenia (*Anania coronata*), an uncommon species whose population may be under threat by invasive parasites and predators.

In summary, we identified 10 spiders (Order Araneae), 12 beetles (Order Coleoptera), 11 true flies (Order Diptera), eight true bugs (Order Hemiptera), 11 bees (Order Hymenoptera), 71 moths and butterflies (Order Lepidoptera), nine damselflies and dragonflies (Order Odonata), 1 stone centipede (Order Chilopoda), 1 scud (Order Amphipoda), 1 crayfish (Order Decapoda), and 1 sow bug (Order Isopoda).

Plants and Fungi Survey

The Preserve was traversed by plant and fungus experts who either identified specimens in the field or brought specimens in question back to Base Camp for a more thorough examination. Scientists worked up until the final minutes of the BioBlitz at 3:00pm Saturday, and resulted in a total of 143 plant species and 13 fungus species.

Other

In order to survey earthworms (Order Annelida) in the Preserve, we mixed 1/3 cup of mustard powder into 1 gallon of warm water, and poured this solution in 4 separate two-foot diameter circular plots on the forest floor. The mustard irritates the sensitive skin of earthworms, causing them to crawl to the surface. The earthworms were then collected, cleaned, and identified under a microscope at Base Camp, resulting in 6 total species, all which are native to Europe or Asia.

Other species identified were leopard slug (*Limax maximus*), snail (*Physa sp.*), a trematode parasite (*Clinostomum sp.*) attached to a fish, and 3 slime molds in the taxonomic class Myxogastria.

Overall Assessment of Ecosystem Health

Overall, the species present within the Preserve are typical of a large open space within an urban/suburban land mosaic. The site does contain species not commonly found in an urban framework, including 2 threatened and 5 avian species of special concern, two forest-dwelling bats, the American eel, and a diverse array of insects and plants. Our observations underscore the importance of the Oros Preserve as an urban biodiversity refuge. Within a 24-hour period, we found that the Preserve's mixture of forests, wetlands, fields, and ponds support at least 388 unique species across a variety of taxa.

Although the Preserve acts like a haven for many wildlife, the site is not immune to the anthropogenic influences of the surrounding landscape. For example, we did not identify as many dragonfly and amphibian species as expected, which is notable because these organisms are sensitive to water quality and environmental toxins, making them known as 'indicator species.' When there is a large diversity of these species in an area, it often means the ecosystem is healthy. However, our scheduled dragonfly expert unexpectedly could not attend, and her expertise may have helped us detect more species. We also did not observe a wide diversity of amphibians. The American bullfrog and green frog were very abundant in the Preserve, but both have a high tolerance for disturbed and degraded habitats. Common frog species in New Jersey include spring peepers (*Pseudacris crucifer*) and wood frogs (*Lithobates sylvaticus*). As they breed in early spring and are cryptic, it is possible that they are present in Preserve. A survey of calling male frogs in early spring is warranted.

In addition to possible water quality issues, the Preserve demonstrates tell-tail signs of an overpopulation of white-tailed deer, which is negatively affecting the site's biodiversity. Due to chronic over-grazing by deer, the shrub and herbaceous layers of the forest lack plant abundance and diversity. Overgrazing not only hurts native plant survival, but allows invasive plants to flourish, which consequently affects the diversity of native birds, small mammals, and invertebrates.

Despite facing the common issues of New Jersey's open spaces, the Ernest L. Oros Wildlife Preserve remains an important biodiversity hot spot in an otherwise highly-developed area. A

large section within the Preserve is secured with a deer exclusion fence and has recently been planted with a variety of native trees, shrubs, grasses, sedges, and other herbaceous plants. Once these plants establish and the habitat matures in the absence of deer, it will be interesting to see how species diversity changes. With continued restoration projects like these and volunteer efforts by the Woodbridge River Watch and others, habitat quality will continue to improve and secure the Preserve as a biodiversity hotspot for generations to come.

We were honored to be a part of this initiative. Please do not hesitate to contact us with any questions or comments.

Sincerely,



Kathleen Kerwin
Program Associate
Wildlife Conservation and Management Program



Brooke Maslo, Ph.D.
Assistant Professor/Extension Specialist
Wildlife Conservation and Management Program