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## Habitat Restoration and Monitoring at the Rapp Road Landfill

Despite efforts to reduce waste production, our landfills are filling up. When landfills have reached the end of their life and are capped, they can be converted to wildlife habitat in certain circumstances. The City of Albany, NY, embarked on an extensive restoration plan for the Rapp Road landfill and surrounding lands as mitigation for their final landfill expansion. The expansion area consumed degraded upland and wetland communities adjacent to the landfill and the Albany Pine Bush Preserve, a globally significant inland pine barrens ecosystem home to state- and federally-listed species such as the endangered Karner blue butterfly (*Plebejus melissa samuelis*). A team was established to develop the mitigation strategy. With experts in prairie and lupine habitat restoration and support by wildlife biologists and wetland restoration specialists, a plan was created with the following objectives:

- Replace ecological functions and values of impacted wetland acreages and restore the natural surface water drainage patterns.
- Restore appropriate upland plant and animal communities in highly degraded upland and wetland environments.
- Restore the ecology, diversity, and beauty of native plant communities in low-quality existing ecosystems.
- Provide for public use and enjoyment of the expanded, restored natural resource areas and open space.

The overriding objective was to create an ecological connection of suitable inland pine barrens habitat between two previously fragmented portions of the Albany Pine Bush Preserve. When habitats are fragmented by human or natural disturbances, the species that rely on them can be impacted or isolated from nearby populations. Disturbances of a permanent or long-term nature can have lasting impacts. According to the Convention on the Conservation of Migratory Species of Wild Animals<sup>1</sup>, ecological connectivity is an essential part of nature, is necessary for the functionality of ecosystems, is key for the survival of wild animals and plant species, and is crucial to ensuring genetic diversity and adapting to climate change across biomes and spatial scales.

In this instance, the landfill and the adjacent mobile home park created habitat fragmentation. With the final closure of the landfill in mind, the opportunity to create more pine barrens habitat and create the needed east-west links to the Preserve became evident. Through a long process of collaboration with the city and the federal and state regulatory and resource agencies, the expansion and the restoration plan were approved in 2008.

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Biologists have been deeply involved in pre-and post-construction surveys and monitoring since the project's inception. Surveys to monitor faunal (wildlife) and floral (plant) response to the restoration efforts and to satisfy permitting requirements, include:

### Faunal Surveys

- Pre-construction/restoration surveys to identify species presence within the degraded habitats.
- Wildlife relocation efforts immediately preceding construction.
- Annual surveys specific to the federally- and/or state-listed Karner blue butterfly, frosted elfin (*Callophrys irus*), and Inland barrens buckmoth (*Hemileuca maia maia*); (state/federal endangered, state threatened/federal Candidate Species, state Special Concern (SC), respectfully).
- Annual surveys specific to state-listed Species of Greatest Conservation Need (SGCN) American woodcock (*Scolopax minor*) and eastern whip-poor-will (*Antrostomus vociferus*).
- Annual surveys specific to eastern spadefoot toad (*Schapiopus h. holbrookii*) and eastern hognose snake (*Heterodon platyrhinos*) (state-listed SC).
- Annual migratory and breeding avifauna (bird) surveys.
- Annual herpetological (reptile and amphibian) trapping.
- Annual insecta (insect) surveys.

### Floral Surveys

- Pre-construction ecological inventories to identify ecological communities and species present.
- Annual vegetation monitoring along designated transects.
- Annual delineation of created and restored wetlands.



The floral establishment in the restoration area over the past 11 years has been impressive. Major habitats present include successional northern sandplain grassland, pitch pine-scrub oak barrens, vernal pond, sedge meadow, riparian wetland, and red maple hardwood swamp, now dominating an area previously composed of a trailer park, landscape areas and disturbed lands. The habitats are dominated by desired native plants endemic to the area. Some native trees were moved from the impact area to the restoration area and allowed to stump sprout. Most of the seed was derived from local genetic seed stock, thus preserving local genetic integrity/resiliency of the area. Intense invasive species management is performed throughout all seasons.

Wildlife has taken notice of the habitat improvements. Several of the target species are well-established and present in abundance throughout their respective suitable habitats. Frosted elfins are abundant from early spring through May.



Karner blue butterflies are abundant from late May through early June during their first brood and then again in early July during their second brood. They sometimes achieve a third brood when meteorological conditions allow. Inland barrens buckmoth is present and has been found in all life stages. Insect surveys have provided extensive data and show use of the site by target species such as the mottled duskywing (*Erynnis martialis*) (NYS-SC) and non-target imperiled species such as the northern amber bumble bee (*Bombus borealis*) (NYS S1 conservation status rank). Results of bird surveys show an abundant and diverse avifauna community with several state-listed species occupying the site during the migratory and breeding windows. American woodcock can be found throughout the site from early spring through fall. Their presence during the breeding season is easily detected by listening for “peenting” and observing flight displays. Eastern hognose snake has more recently become well-established throughout the site. Trapping efforts have shown abundant populations of frogs, toads, turtles, and as bycatch, small mammals.

Monitoring results are provided each year to the New York State Department of Environmental Conservation (NYSDEC), United States Fish and Wildlife Service (USFWS), and the Albany Pine Bush Preserve Commission (APBPC) as part of the yearly compliance reporting.

Restoration is ongoing, with most of the restoration adjacent to the landfill complete and undergoing management. Restoration of currently capped/inactive portions of the landfill began in the spring of 2022; it will take several years to complete all portions. Test plots were established on a closed portion of the landfill to determine the depth of native Pine Bush soils (fine sands) necessary to support native species and preclude non-native and aggressive species. An unexpected outcome of that effort was the establishment of Karner blue butterflies on the test plot, proving that the elevation and other factors of this unusual landscape do not deter this species. Restoration to pine barrens will provide even greater connectivity within the Albany Pine Bush Preserve that will benefit biodiversity, air and water quality, and public enjoyment.

### Conclusion

Through monitoring efforts, we can show that the restoration efforts to date have successfully achieved the goal of providing high-quality habitats, habitat connectivity, and target species occupation. These efforts have strengthened the habitat availability and resiliency of a globally rare inland pine barrens ecosystem in the Capital Region of New York State. Future restoration efforts on the landfill will expand these benefits for biodiversity.

The consulting team on this effort included CHA and Applied Ecological Services (now RES).

*About the Author:* John Greaves IV, CWS, CWB\*\*, Certified Senior Ecologist\*\*\* is a Senior Environmental Scientist at CHA Consulting, Inc. John has 20 years of professional experience in wildlife, vegetation, wetland delineation, ecological inventories, threatened and endangered species surveys, habitat creation, habitat management, wetland mitigation, stream assessment, environmental screenings and environmental permitting. Specialties include identification and natural history of wildlife, vegetation and ecological communities, biodiversity, environmental impact assessment, and environmentally sensitive design. You can reach John at [JGreaves@chacompanies.com](mailto:JGreaves@chacompanies.com).

\*\*The Wildlife Society

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1 Convention on the Conservation of Migratory Species of Wild Animals. Ecological Connectivity. Available from: <https://www.cms.int/en/topics/ecological-connectivity>. Accessed August 30, 2022.



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