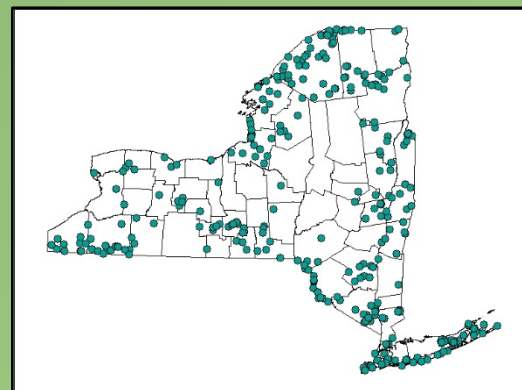


Maintaining the Accuracy of Biodiversity Information for Conservation

A report to the Sarah K. de Coizart

Article TENTH Perpetual Charitable Trust



New York
Natural Heritage
Program

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by the
New York Natural Heritage Program

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Cover images (clockwise from top left): Northern metalmark (Matthew D. Schlesinger), eastern wormsnake (Matthew D. Schlesinger), incurvate emerald (Erin L. White), map of database records of at-risk species documented for this project, eastern pearlshell (Erin L. White), example of remapping old database records with newer GIS methodology.

Introduction

The database maintained by the New York Natural Heritage Program is the primary source of information on biodiversity used in environmental review by state agencies in New York and one of the important inputs in setting priorities for conservation organizations. In early 2014, we received a \$150,000 grant from the Sarah K. de Coizart Article TENTH Perpetual Charitable Trust (the Trust) to update the status of rare animal populations through field surveys and by processing data from our considerable backlog. The grant was instrumental in helping us keep our database information current and protecting New York's biodiversity. This report will summarize our activities and accomplishments under the grant and present some highlights in greater detail.

Grant expenditures

Funds were received in early February, 2014 and our project officially began on March 1, starting with database updates using existing information in our backlog. Field surveys began in June after the approval of our required Institutional Animal Care and Use Committee protocol.

In addition to staff time and travel, grant funds were used to purchase a field camera: a Canon EOS Rebel T5i, a 100-mm macro lens, and a 75-300 mm telephoto zoom lens. This camera enables us to take high-quality photographs that can be used to assist with species identification, document our observations without needing to retain specimens, and document habitat conditions. We also purchased a Dell laptop for processing existing data into Biotics, our database of rare and at-risk animals.

Field surveys

We conducted 116 surveys on 64 dates between May 3, 2014 and January 15, 2016. Just over half of these were what we call “updates”—surveys of locations with documented at-risk animal species to determine their current status. About one-third were “*de novo*” surveys, meaning surveys of promising locations that to our knowledge had not been surveyed previously for the target species. The remainder were some combination of update and *de novo* surveys; for instance, we sometimes look for new populations of rare animals near existing locations.

Our surveys covered all corners of New York State and our targets spanned the animal kingdom: bats, seals, birds, turtles, lizards, snakes, frogs, dragonflies, beetles, butterflies, bumble bees, moths, and freshwater mussels. Our field methods included visual surveys (birds, seals, frogs, tiger beetles), acoustic surveys (bats), hoop trapping (turtles), pitfall trapping (carrion beetles), light trapping (moths), netting (dragonflies, butterflies, bees), and flipping cover objects (snakes). Below we highlight some of our most significant efforts in short case studies.



Kelly Perkins with painted turtles (*Chrysemys picta*). (Erin L. White)



Jeff Corser with Cyrano damselfly (*Nasidictyon pentacantha*). (Erin L. White)

West Virginia white

Funding from the Trust allowed us field time to follow up on our suspicions that West Virginia white butterflies (*Pieris virginiensis*) occurs in the Taconic Range in Columbia and Rensselaer counties in New York. Prior to these surveys, the closest known documented locations of the butterflies in New York were in Greene and Delaware counties in the Catskill region. The rest of the occurrences in the Natural Heritage database were from the western half and northern regions of the state. Until this project, we did not have funding to support an inventory effort in this region. Surveys were conducted on seven properties in Columbia and Rensselaer Counties in mid-May of 2015 to search for the butterflies, which typically occur near streams and wet areas, or within moist forest, dense with spring wildflowers and their foodplant, broadleaf toothwort (*Cardamine diphylla*). The butterfly was discovered on four of the seven properties at multiple locations on most properties.

West Virginia white butterflies are experiencing declines in parts of their range. They have limited dispersal capabilities due to their reluctance to cross open areas that lack forest canopy and they are threatened by the invasive garlic mustard (*Alliaria petiolata*). The butterflies mistake the invasive plant for a suitable foodplant for their larvae and lay their eggs on it; however, the plant is toxic to their caterpillars.

These surveys had direct impacts on the conservation of this species in some locations. The discovery of the species at the Capital District Wildlife Management Area was particularly timely since biologists responsible for the property were in the process of developing a harvest plan to



West Virginia white butterflies (*Pieris virginiensis*) at Berlin State Forest, Berlin, NY, nectaring on a mustard plant. (Kelly A. Perkins)

create early-successional habitat there. Since this species is susceptible to reduced canopy cover and changes to the forest flora caused by increased light and disturbance from harvesting, the species could have been affected by the harvests. Data on the locations of the butterflies were provided to the biologists responsible for writing the harvest plans, so that

they could avoid harvesting in areas where the butterfly is present. At a preserve owned by Columbia Land Conservancy where we found the butterfly, there is an especially nice pocket of mixed mesophytic forest with an abundance of spring wildflowers for adult forage and the foodplant for larvae; however, it is adjacent to a public walking trail and the invasive garlic mustard was moving in along the trail. We contacted Columbia Land Conservancy to provide locational information on the butterflies and invasive plant, as well as management recommendations that they intend to act on quickly.

For more information

West Virginia white: <http://guides.nynhp.org/guide.php?id=7830>

Capital District Wildlife Management Area: <http://www.dec.ny.gov/outdoor/86016.html>

Columbia Land Conservancy: <http://clctrust.org/>

Tiger beetles

Tiger beetles are ground beetles whose intricate patterns and bright colors have captivated insect enthusiasts for centuries. Many of New York's 22 species are habitat specialists and are naturally rare, but alterations to these habitats have caused declines in several species. With funding from the Trust we were able to survey for three at-risk species of tiger beetles: The Appalachian tiger beetle (*Cicindela ancosisconensis*), a stream and river sandbar specialist; the hairy-necked tiger beetle (*C. hirticollis*), an ocean and lake beach specialist; and the northern barrens tiger beetle (*C. patruela*), a pine barrens and rocky ridgetop specialist. Our Adirondack surveys found new sandbars with *C. ancosisconensis* and confirmed it in locations last surveyed in the late 1990s. We also confirmed *C. hirticollis* on the two beaches on the New York side of Lake Champlain where it had been documented previously, and found new locations on ocean beaches in Long Island. The northern barrens tiger beetle is known only from Minnewaska State Park Preserve in the Shawangunk Mountains, and our extensive surveys of additional seemingly suitable habitat did not result in new locations for this elusive beetle, bolstering the case for its being one of the state's rarest insects.



Appalachian tiger beetle (*Cicindela ancosisconensis*) (Matthew D. Schlesinger)



Hairy-necked tiger beetle (*Cicindela hirticollis*) (Matthew D. Schlesinger)



Northern barrens tiger beetle (*Cicindela patruela*) (Matthew D. Schlesinger)

For more information

Appalachian tiger beetle: <http://guides.nynhp.org/guide.php?id=7564>

Hairy-necked tiger beetle: <http://guides.nynhp.org/guide.php?id=7565>

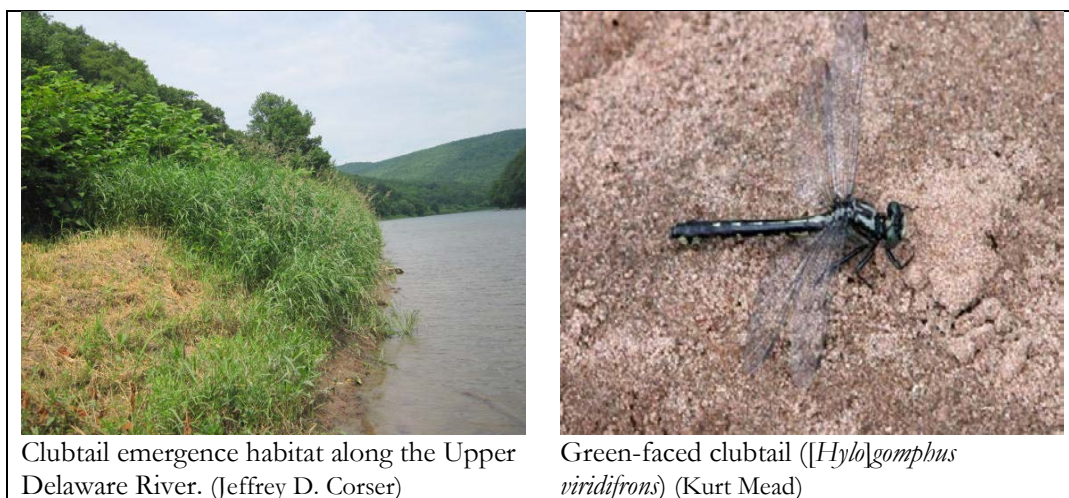
Northern barrens tiger beetle: <http://guides.nynhp.org/guide.php?id=37144>

Minnewaska State Park: <http://www.nysparks.com/parks/127/details.aspx>

Riverine clubtails

The Green-faced clubtail (*[Hyla]gomphus viridifrons*) is one of a group of rarely seen dragonflies that inhabit medium-to-large clean rivers in the Appalachians and upper Midwest. While the aquatic predatory larvae burrow into river sediments, the short-lived adults spend their time in tall trees bordering the river or “hilltopping” above the river valley. In either case, they are almost never observed. In fact, this species is so rare on the northern fringe of its range that only a few emergence locales were known from the early 1990s along the Upper Delaware River bordering Pennsylvania. Before that, the only winged adult ever found in New York dated back to 1940. Using funding from the Trust in 2014, 2015, we were able re-confirm the existence of this species in the Delaware watershed. First, in 2014 while picking up exuviae (shed skins) of emerging dragonfly larvae along the riverbanks, we gathered what we believed was evidence of breeding Green-faced clubtails at a couple places along the Upper Delaware River. Yet these cast-off exuviae can be very difficult to identify to species level among the closely related clubtails that share the river, including some of the more common ones. So in early June 2015, when high water on the Delaware forced us to higher ground on one of its tributaries, the Neversink River, we were surprised and elated to discover a

healthy population of Green-faced clubtail breeding adults. After many missed attempts at netting one of these astonishingly fast insects (which undoubtedly contributes to their elusiveness), we succeeded in obtaining the first adult specimen of this species from New York in 75 years. The discovery of several other rare dragonflies in 2014, 2015, including an endemic species, attests to the high value aquatic/forest biodiversity status of the Upper Delaware River watershed.



Clubtail emergence habitat along the Upper Delaware River. (Jeffrey D. Corser)

Green-faced clubtail (*[Hyla]gompbus viridifrons*) (Kurt Mead)

For more information

Green-faced clubtail: <http://guides.nynhp.org/guide.php?id=8196>

Upper Delaware River: <http://www.nps.gov/upde/index.htm>

Atlantic Coast leopard frog

In 2014, we helped formally describe a new species, the Atlantic Coast leopard frog (*Rana kauffeldi*) from the coastal Northeast and were awarded a Regional Conservation Needs grant to study the status and distribution of this species throughout its range. Funding from the Trust allowed us to supplement our survey work in New York with several more field days. While this species appears quite common in the southern parts of its range, at its northern fringe it has



Nate Silver surveying a wetland for leopard frogs. (Matthew D. Schlesinger)

The Atlantic Coast leopard frog (*Rana kauffeldi*). (Matthew D. Schlesinger)

experienced severe declines. We conducted nocturnal calling surveys in April and followed up with many daytime visits to promising wetlands, but did not unearth new populations. These surveys will help make the case for the Atlantic Coast leopard frog's possible listing as Threatened or Endangered by the state of New York.

For more information

Atlantic Coast leopard frog discovery: <http://www.wnyc.org/story/high-fives-for-staten-islands-very-own-frog-species/>

Regional Conservation Needs grant: <http://rcngrants.org/content/distribution-and-conservation-status-newly-described-species-leopard-frog-coastal-ne>

Plum Island

Our funding from the Trust permitted some additional survey work in 2015 on Plum Island, where we conducted a one-year biodiversity inventory for the New York State Department of



Erin White checking a hoop trap in Plum Island's large wetland. (Matthew D. Schlesinger)



Two painted turtles (*Chrysemys picta*) caught in a hoop trap. (Matthew D. Schlesinger)

Environmental Conservation (NYS DEC) with the cooperation and support of the U.S. Department of Homeland Security, who manages the island. Plum Island is the location of a federal animal

disease laboratory, but over two-thirds of the 840-acre island is undeveloped and supports several at-risk species, as we documented in a 2012 report. Until recently, however, a comprehensive inventory of the island had not been attempted and we have known little about the potential occurrence of many other species of conservation concern. With the laboratory slated to move to a new facility in Kansas in the 2020s, the future ownership of the island is in doubt. Whatever the eventual disposition of the island, knowledge of its biodiversity is critical for its proper management. Our surveys in 2015 targeted bats, amphibians and reptiles, and multiple insect groups. Funding from the

Trust allowed for several additional trips to the island, maximizing our chances of documenting new locations of at-risk species.



Matt Schlesinger installing a pitfall trap for carrion beetles in a Plum Island meadow. (Erin L. White)



Two carrion beetles (*Nicrophorus* sp.) in a pitfall trap. (Matthew D. Schlesinger)

For more information:

2012 report: <http://nynhp.org/PlumIsland>

Backlog data processing

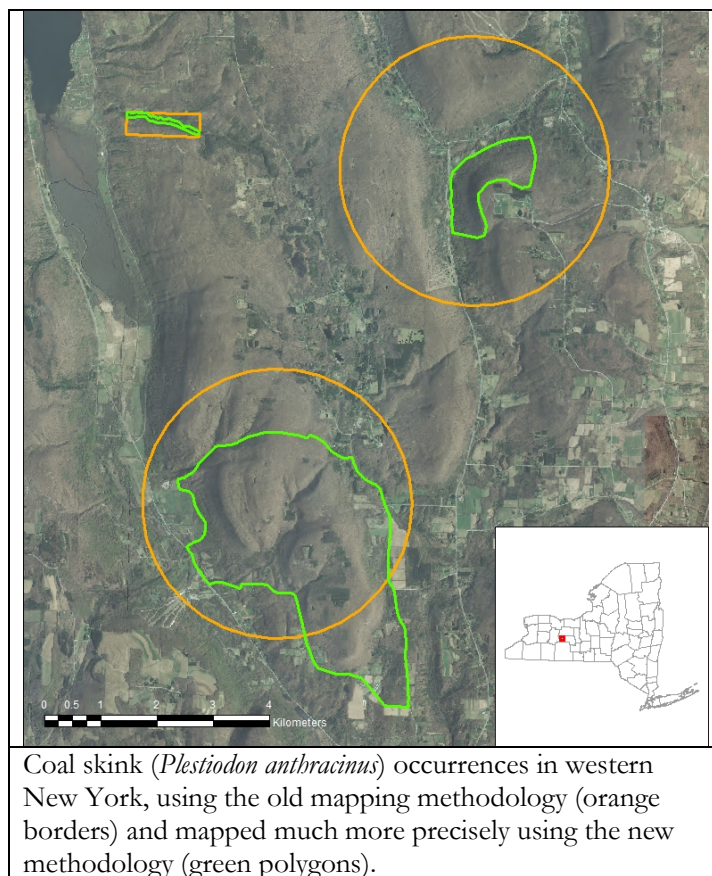
About one-third of our time on this grant was spent mapping and transcribing records from our large backlog of unprocessed data. The fundamental unit of a Natural Heritage database record is the “element occurrence,” defined as an area of land or water where a species is, or was, present. Each record of an element occurrence involves detailed mapping and thorough documentation of

species observations and habitat information. With funding from the Trust, we added or updated 378 element occurrence records. Of these, 59 were from the field surveys described above and 319 were from our backlog. By way of comparison, our funding from the NYS DEC covers 90 records per year, with a focus on a few high-profile species. Thus, over the two-year period, funding from the Trust allowed us to triple the number of records we added or updated!

We focused considerable effort on occurrences of lesser-known taxa that do not have the benefit of an official state listing as Threatened or Endangered but may be even more at risk. We worked on multiple species of rare dragonflies and damselflies, as we completed a statewide Atlas project for this group in 2010 but did not have the funding to get all the data converted into element occurrences at that time. We completed 171 dragonfly and damselfly element occurrences under this project. In addition, we added or updated records of freshwater fish (68), butterflies and moths (45), bumble bees (33), freshwater mussels (22), beetles (11), birds (10), lizards and snakes (8), turtles (3), seal haul-out sites (3), bats (2), and salamanders (2). Each of these records represents another location for an at-risk species that NYS DEC permitting staff will encounter when they screen projects for conflicts with natural resources, which may afford these populations protection that would not otherwise be possible.

Funding from the Trust allowed us to process element occurrences for 25 species for the very first time. Our list of “tracked species”—those at-risk species for which we map occurrences and keep detailed information on each—is regularly updated as new information becomes available from partners in the research and conservation community. In recent years, we have added new species of birds based on their recent colonization of the state, bumble bees and lady beetles based on recent research into species declines and our own data analysis, dragonflies and damselflies stemming from our Atlas project, and freshwater fish based on a newly available statewide database from our state agency partners. This project allowed us to map the first occurrences of these species.

Of the 378 element occurrences completed, 308 were new to the database and 70 were updates. Updates to existing occurrences ranged from minor changes like adding recent survey data to major changes like remapping occurrences. Nationwide, when Natural Heritage data were first mapped using Geographic Information Systems (GIS), the technology was young, and occurrences were represented using regular shapes like circles and rectangles. While these shapes usually captured the occurrence within them, they were usually bigger than the true occurrence and thus overrepresented the occupied area. Modern GIS allows much more precise delineation of occurrences. Some imprecise mapping has remained in our database, but we aim to whittle those shapes down as time and funding permit. In the example at right, we



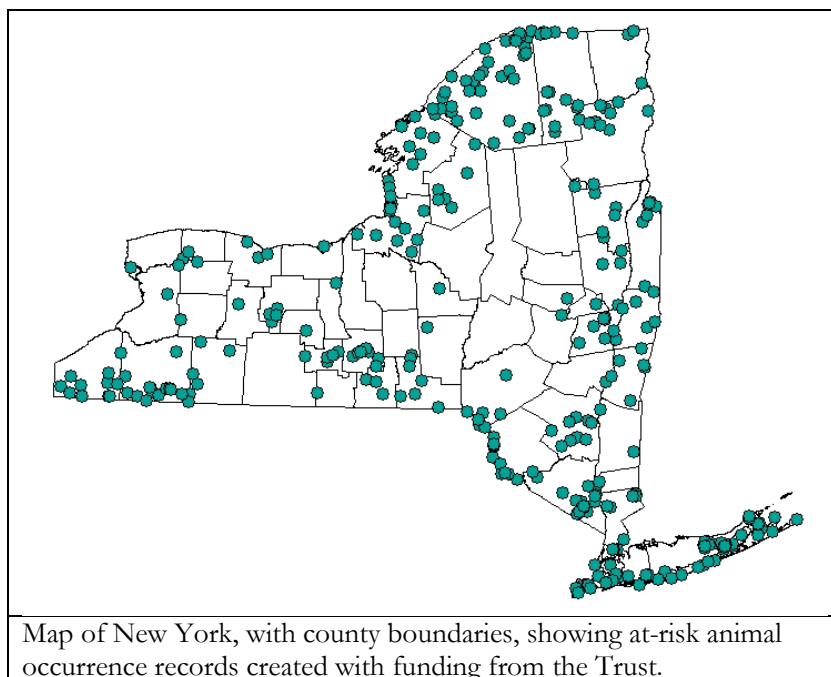
remapped three polygons representing coal skink occurrences in western NY to the more precise polygons that the observation data warranted. Notice that in one case, the circle that had represented the occurrence was determined to underrepresent the area occupied, so the remapping also might yield additional protected area.

For more information

New York Dragonfly and Damselfly Survey: <http://www.nynhp.org/NYDDS>

Conclusions

The hundreds of records of at-risk species that we were able to update or add to the Natural Heritage database under this project will have a significant impact on biodiversity conservation in New York. The new and updated database records, shown to blanket the state in the map below, represent locations where project screening will ensure that biodiversity considerations are taken into account. As our database information gets older, the status of at-risk species populations becomes more uncertain and our



information less useful to some. Keeping the database current has thus long been a priority for our program but we have not had sufficient funding to reduce our data backlog and update the status of populations with field work. The funding from the Sarah K. de Coizart Article TENTH Perpetual Charitable Trust has been instrumental in ensuring that New York State's most important source of biodiversity information has the most up-to-date data to maximize the effects of conservation efforts.

Acknowledgments

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About the New York Natural Heritage Program

The New York Natural Heritage Program (www.nynhp.org) is a program of the State University of New York College of Environmental Science and Forestry that is administered through a partnership between SUNY ESF and the NYS Department of Environmental

Conservation. We are a sponsored program within the Research Foundation for State University of New York.

The mission of the New York Natural Heritage Program is to facilitate conservation of rare animals, rare plants, and significant New York ecosystems. We accomplish this mission by combining thorough field inventories, scientific analyses, expert interpretation, and a comprehensive database on New York's distinctive biodiversity to deliver high-quality information for natural resource planning, protection, and management.

Established in 1985, our program is staffed by 25 scientists and specialists with expertise in ecology, zoology, botany, information technology, and geographic information systems. Collectively, the scientists in our program have over 300 years of experience finding, documenting, monitoring, and providing recommendations for the protection of some of the most critical components of biodiversity in New York State. With funding from a number of state and federal agencies and private organizations, we work collaboratively with partners inside and outside New York to support stewardship of New York's rare animals, rare plants, and significant natural communities, and to reduce the threat of invasive species to native ecosystems.

NY Natural Heritage maintains New York State's most comprehensive database on the status and location of rare species and natural communities. We presently monitor 181 natural community types, 803 rare plant species, and 474 rare animal species across New York, keeping track of more than 13,500 locations where these species and communities have been recorded. Our database also includes detailed information on the relative status of each species and community, the quality of their occurrences, and descriptions of sites. The information is used by public agencies, the environmental conservation community, developers, and others to aid in land-use decisions. Our data are essential for prioritizing those species and communities in need of protection and for guiding land-use and land-management decisions where these species and communities exist. NY Natural Heritage is an active participant in NatureServe (www.natureserve.org), the international network of biodiversity data centers. NatureServe's network of independent data centers collect and analyze data about the plants, animals, and ecological communities of the Western Hemisphere. The programs in the NatureServe Network, known as natural heritage programs or conservation data centers, operate throughout all of the United States and Canada, and in many countries and territories of Latin America. Network programs work with NatureServe to develop biodiversity data, maintain compatible standards for data management, and provide information about rare species and natural communities that is consistent across many geographic scales.