# BIODIVERSITY INFORMATION FOR DECISION-MAKERS:
# A CONSERVATION PARTNERSHIP IN NEW YORK

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**Abstract:** The New York Natural Heritage Program (NYNHP) tracks over 12,500 locations of rare and endangered species and significant natural communities in New York in a complex tabular and spatial database format. The New York State Department of Transportation (NYSDOT) is responsible for approximately 15,000 miles of highways in the state, of which about 8,300 miles intersect with NYNHP rare species and natural community locations.

NYNHP has for years provided NYSDOT with Geographic Information Systems (GIS) digital spatial data of its precise locations.  However, knowing these locations is of limited benefit if the data users don't know exactly what kind of habitat is used by that species or how DOT activities could impact it.  It had become apparent to both partners that many NYSDOT staff, including those making decisions that could potentially result in on-the-ground impacts to biodiversity, had little awareness of the NYNHP dataset, nor how to interpret and apply the data to their daily operations. To address this gap in understanding, NYSDOT funded a 5-year project entitled Biodiversity Information for Decision-Makers (BIDM).

The overall objective of this project was to provide NYSDOT with powerful new conservation tools that would assist their staff in both project site-level planning and planning in a broader context. These new tools should help staff make better decisions about how to design and modify activities that might affect rare species and natural communities.

This objective was achieved through three primary procedures: 1) Improved mapping of selected Heritage locations; 2) Modeling the landscape surrounding known Heritage locations (Important Areas); and 3) Creating online fact sheets of NYNHP's listed species and communities (Conservation Guides).

Over 400 Natural Heritage locations were screen-digitized to increase the precision of their spatial representation, and these locations were an essential input for the next procedure, Important Area modeling.

Important Areas (IAs) are the areas around known observed locations that have conservation importance, and are modeled by enlarging or buffering the observation locations based on natural history requirements of a species, species guild, or natural community. For example, while a turtle might have only been observed in a specific wetland, the IA would also include upland habitat that the turtle needs for breeding and for dispersing between wetlands. Forty-seven (47) IA models (automated in Python script tools in ArcGIS) have been developed in New York State through this project. GIS datasets of Natural Heritage locations and of IAs, along with documentation and training in applying them, have been provided to NYSDOT staff having direct responsibility for potential ecological impacts on the ground.

NYNHP has also posted on its public website online "Conservation Guides" for over 200 rare species and natural communities. These guides provide concise, easily accessible information about habitat, why the species and ecosystems are rare, threats to their viability, management considerations, and other information that NYSDOT planners and managers can use to make informed decisions regarding land use, natural resources, and transportation infrastructure. The guides offer insight that translates a catalogue of NYNHP locations into a conservation tool understandable to anyone.

**POWERFUL NEW CONSERVATION & PLANNING TOOLS**

The New York Natural Heritage Program (NYNHP) tracks over 12,500 locations of 1,078 rare and endangered species and significant natural communities in New York in a complex tabular and spatial database format. Most partners that use New York Natural Heritage Program (NYNHP) data for planning and conservation do not have technical science training. As such, sharing raw NY Natural Heritage data with them is not necessarily providing the information they really need for effective action. NY Natural Heritage has therefore partnered with the New York State Department of Transportation (DOT) to develop interpreted information that DOT planners and project managers can use to further conservation of New York's most imperiled animals, plants, and ecosystems.

This interpreted information (a) shows the areas important to each rare species and significant ecosystem (not just where they were found); and (b) explains how they are threatened and what management considerations will help ensure their survival. The information has been developed in two formats – Geographic Information Systems (GIS) digital spatial data and online conservation guides. These resources will provide important technical information early in decision-making processes. This information will enable users to:

- understand the implications of rare species and significant ecosystems at different sites
- make better decisions about how to design and modify activities that may affect them
- put the rare species and significant ecosystems into a broader context for planning

These resources have just recently been rolled out to the DOT, but we expect that ultimately they will result in more complete DOT project plans, faster project reviews, and more informed land-use decisions that will help ensure the conservation of these imperiled resources.

The DOT has provided NYNHP with funding to create GIS data and online conservation guides for the 235 rare species and 48 ecosystem types that occur within New York City and Long Island, with the goal of eventually rolling these products out statewide. There were three main components of this project:

1) Digital re-map of coarsely mapped NYNHP species and natural community (ecosystems) locations on Long Island and in New York City.
2) Develop GIS spatial data that interprets the NYNHP locations to not just the location where an NYNHP animal, plant, or natural community was found, but to also include the area important to the viability of the species or natural community at a given NYNHP location, These areas are referred to as Important Areas (IAs).
3) Develop publicly accessible online fact sheets of NYNHP's listed species and communities. These fact sheets are referred to as Conservation Guides or simply Guides.

**Digital Re-Maps**

During its first 13 years of operation, NYNHP mapped locations of rare species and of significant natural communities on paper USGS 1:24,000 7.5' x 7.5' topographic maps. Each individual location of a given species or community type is called an element occurrence, or occurrence. If the occurrence occupied a very small area, smaller than 100 meters across (such as occurrences consisting of only a few plants), it was represented with a dot on the map, and a mylar grid was used to calculate the latitude and longitude (lat/long) of the dot; this lat/long was then entered into the Natural Heritage database. If the occurrence occupied a larger area (as with almost all natural communities), the boundaries of that area were drawn on the paper topo map, and the mylar grid was used to calculate not only the lat/long of a centrum point, but also the latitudes of the northernmost and southernmost extents and the longitudes of the easternmost and westernmost extents, which again were entered into the database.

The actual locations of many occurrences are not known, because of a lack of detail in the original source documentation. If the actual location of such an occurrence was presumed to be within 1.5 mi (about one minute of latitude or longitude) of a likely point, that point was mapped on the paper topo map, and the occurrence was assigned an M in the database for 'Minutes precision'. If the actual location could only be narrowed down to within 5 miles of a point, that point was mapped and the occurrence was assigned a G for 'General precision'. The lat/long of these points were calculated and entered into the database.

In the late 1990's, NYNHP started digitally mapping occurrences using GIS, and had to convert all the existing occurrences mapped on paper. It was impractical to hand digitize all the occurrences already mapped on paper, so in 1999 some procedures were developed which allowed for the quick conversion of occurrences into GIS, but which in many cases generalized the location of the occurrence.

For occurrences mapped with just a point, the lat/long from the database was used to digitize a point which was then buffered up to 100 meters. For occurrences mapped with hand-drawn boundaries on the map, the latitudes and longitudes of the extents of the boundary were pulled from the database and used to create a rectangle called the 'least rectangle', so named because it was the smallest rectangle that could still contain the full extent of the mapped occurrence.

For occurrences assigned M, the lat/long in the database was used to define a point, which was then buffered by 1.5 miles to form a large M-precision circle. For occurrences assigned G, the lat/long in the database was used to define a point, which was then buffered by 5 miles to form a very large G-precision circle.

The end result of the conversion to GIS of occurrences mapped on paper was a set of occurrences that were accurately mapped (originally mapped to just a very small area), and a set of occurrences whose representation in GIS was generalized with least rectangles or large circles. At the start of this project, 36 rare animal occurrences, 250 rare plant occurrences, and 116 significant community occurrences on Long Island were represented in NYNHP's spatial database (Biotics) as least rectangles. An additional four recent animal occurrences and 17 recent plant occurrences on Long Island were represented with large M- or G-precision circles.

With GIS, we have the ability to accurately digitize the actual boundaries of occurrences known to cover a large area. For occurrences whose precise locations are not known, we have the ability to digitize for each occurrence a custom area, somewhere within which that occurrence is presumed to have actually occurred. However, performing this digitizing on the occurrences converted from paper maps was opportunistic, depending on funding.

One goal of this project was to digitize more accurate spatial representations of these least rectangles and large circle occurrences on Long Island, using existing information and recent aerial photography. Re-maps included a careful review of all associated database records and manual files in order to determine the best available information on the location.

NYNHP has been providing EO data to DOT for years. Now hundreds of them are mapped more precisely, and were available as input for the Important Area mapping. Both the raw EO and interpreted IA data will serve DOT as valuable project planning resources.

**Interpreted NYNHP Data: Important Areas**

Important Areas (IAs) are lands and waters that support the continued presence and quality of known populations of rare animals and rare plants, or of documented examples of rare or high-quality ecological communities. Important Areas include the specific locations where the animals, plants, and/or ecological communities have been observed, but go beyond these to also include:

- additional habitat for the rare animal and plant populations, including areas which may be used by rare animals for breeding, nesting, feeding, roosting, or over-wintering.
- areas that support the natural ecological processes critical to maintaining the habitats of these rare animal and plant populations, or critical to maintaining these significant communities.

Important Areas are digitally delineated using Geographic Information System (GIS) geo-processing tools and models (ESRI ArcGIS and Python scrimping language), based on methodologies developed by NYNHP biologists. For rare animals, the models are based on knowledge of the animal's habitat and life history. For example, the Important Area for a Southern Leopard Frog (*Lithobates sphenocephalus*) would extend beyond the wetland where it was found (the EO) to include the various breeding wetlands during nocturnal rains.

Important Areas also include land around these animal habitats, and around rare plant populations and significant ecological communities that sustain ecological processes and that provide a buffer against disturbance. For example, for the wetland habitats identified for the Southern Leopard Frog above, the Important Area would also include an area around the wetlands that would contribute to maintaining favorable water quality and flow in the wetlands. The size of these surrounding areas can vary depending on the steepness and aspect of slopes, the type of soils, and the surrounding land cover.

Important Areas do not include all potential habitat for the species within its range; rather, they are the areas important to known populations and locations. Important Areas are based on best

available information, but do not represent a comprehensive inventory of resources or habitats. Lands outside the Important Areas on these maps may also support rare animals and plants and significant ecosystems, or provide ecological benefits.

With funding from New York State Department of Transportation (DOT), NYNHP has completed a set of 47 Important Area models around more than 2,444 individual locations of about 73 animal species (1093 occurrences), about 125 plant species (1090 occurrences), and about 37 ecological community types (261 occurrences), in New York City and Long Island. Please see Appendix A for a table of the Important Area models developed for this project. The Important Area data layers will be used by DOT staff to incorporate more biodiversity information in planning and project management. Important Area data layers will also be provided to New York State Department of Environmental Conservation (DEC) staff and other state agencies, and to conservation partners for use in biodiversity protection and conservation.

**Conservation Guides**

Conservation Guides (Guides) ([www.guides.nynhp.org](www.guides.nynhp.org)) are online fact sheets for the species and natural communities whose locations NYNHP tracks in its database, Biotics. The Guides that existed before this project were completed under an earlier project funded by the New York State Department of Environmental Conservation (NYSDEC) Hudson River Estuary Program (HREP), to assist land use planning and decisions. Development of these Guides has been an ongoing task for the Program. As a result of funding provided by DOT through this project, Guides for 73 animals, 125 plants, and 37 natural communities have been created. These Guides explain basic ecological information, including identifying characters, life history information, and distribution. The Guides also contain information on conservation issues, including trends, threats, management implications, and research needs. Please see Appendix B for an example of the Guides.

In creating new and revising existing guides there was a focus on consistency, both in how the information is presented and in the level of detail the Guides contain. Where possible, redundancy was reduced by addressing conservation issues for groups of ecologically similar species and by linking threats and management considerations for individual species back to the community (or habitat) within which they reside. Specifically, the Guides include the following:

- specific and detailed information on management practices/techniques for use by decision-makers and conservation practitioners;
- information addressing both biodiversity considerations, development considerations, and impact abatement;
- more links to and references for successful species-specific management techniques and scientific research;
- more links to other resources, including other conservation programs, permits, agency contacts, and conservation issues such as invasive species;
- research needs for better management and protection; and
- improved look and functionality.

While the scope of the previous Guides had been limited to those species and communities found in the lower Hudson River Basin, the study area for this project focused on Long Island and New York City. The first step of this project was for NYNHP to develop a prioritized list of Conservation Guides that needed to be revised or created.  Once the list was established, available data was synthesized, scientific literature was reviewed, and NYSDEC staff and other experts were consulted to create draft revised/new Conservation Guides.   These draft guides were reviewed by NYSDEC staff.  Once approved, New York Natural Heritage Program posted them on the Guides website (www.guides.nynhp.org).

For developing the Guides, NYNHP used the following methodology:
1.  Develop management considerations by synthesizing existing information in the NY Natural Heritage database, review of scientific literature, and consultation with experts.  Management considerations combine information on ecological processes, habitat requirements, and points of vulnerability with discussions of threats, such as hydrologic changes or intensive logging. They provide general information that can be integrated into site-specific decisions.
2.  Prepare descriptions with explanations of processes that are geared for municipal and agency planners, and conservation professionals that do not have biological training.  Prepare similar descriptions for groups of species that share a common habitat and are so technical in nature that there is less demand for specifics on each species, such as selected pine barrens moths.
3.  Obtain clear photographs showing species, and natural community type and natural community class.
5.  Develop map templates that pull locational data directly from the NY Natural Heritage database to display locations within the Hudson River Valley and New York for each rare species and natural community type.
6.  Develop conservation guide templates that pull information fields directly from the NY Natural Heritage database, thereby allowing rapid and automatic updates as new information becomes available.
7.  Generate conservation guides for the 198 animal and plant species, and 37 natural community types currently known within the Long Island and New York City study area.  These conservation guides may include, at a minimum: species/natural community name, state rarity rank, global rarity rank, description (including, for natural communities, characteristic plant and animal species), factors that determine quality, distribution map of known exemplary occurrences, best time to see (for rare species), excellent example (only for communities with occurrences on lands open for public visitation), and list of source information.
8.  Prepare hard copy versions of conservation guides and distribute these copies to partners interested in reproducing them and distributing them further. Also, post the conservation guides on the NY Natural Heritage web site in formats that can be downloaded.  Ensure that links to the web-based conservation guides are in partner web sites, particularly NYS DEC's NY Nature Explorer.

In the fall of 2012, NYNHP and DOT conducted a survey to gather feedback on how the Guides are used by DOT staff. Of the 105 invited participants in the survey, 32 responded. Ninety percent of the respondents were very or somewhat familiar with the guides. Figure 1 shows the percent of participants that used the Guides for the purposes shown.
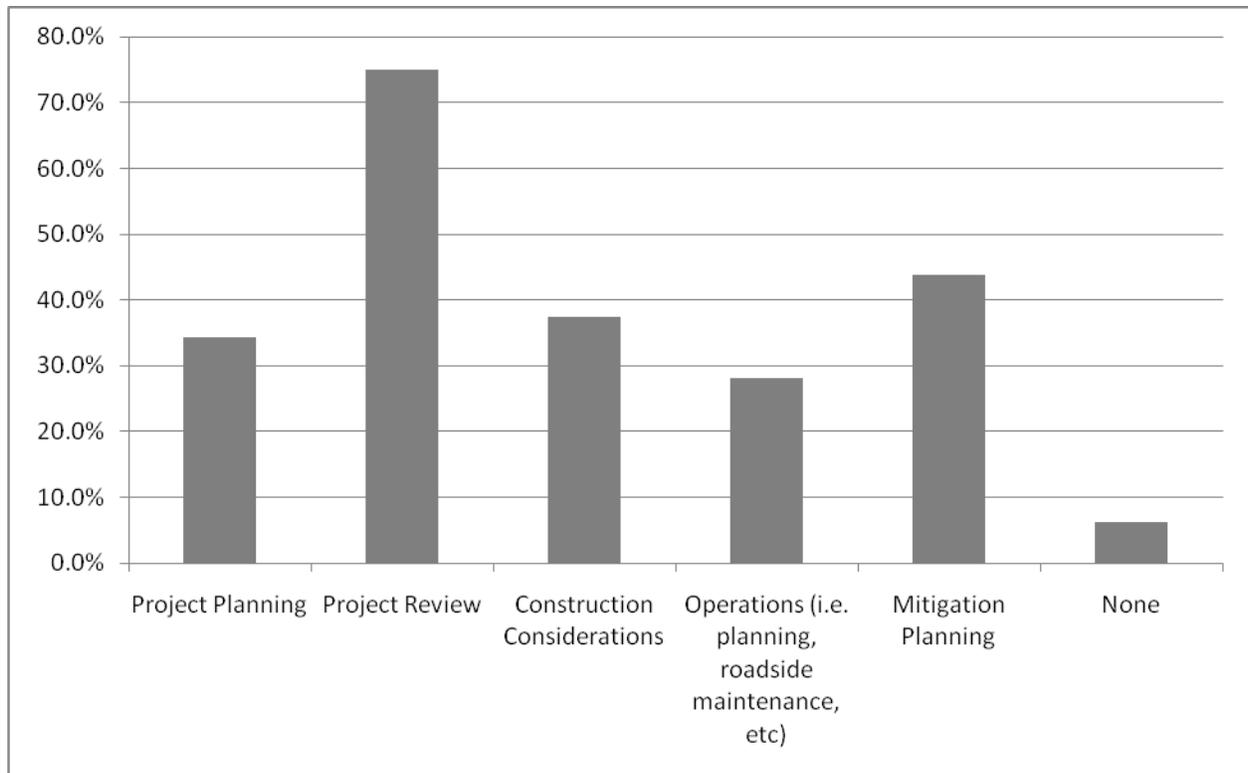
FIGURE 1

Table 1 shows the percent of participants and their determination of the level of usefulness of each section of the Guides.

| | Very Useful | Somewhat Useful | Neutral | Not Useful |
|---|---|---|---|---|
| Summary | 62.5% | 25.0% | 12.5% | 0.0% |
| Conservation & Management | 46.9% | 25.0% | 28.1% | 0.0% |
| Habitat (Animals and Plants Only) | 78.1% | 9.4% | 12.5% | 0.0% |
| Range | 71.9% | 15.6% | 12.5% | 0.0% |
| Identification Comments | 68.8% | 21.9% | 9.4% | 0.0% |
| Taxonomy (Animals and Plants Only) | 25.8% | 45.2% | 25.8% | 3.2% |
| Classification (Communities Only) | 41.9% | 32.3% | 22.6% | 3.2% |
| Additional Resources | 25.8% | 29.0% | 45.2% | 0.0% |

TABLE 1

Extensive comment sections in the survey have provided much desired insight into how users view these guides. NYNHP staff reviewed these comments and plan to implement some changes and revisions as funding becomes available. For example, one of the most common requests from DOT staff has been for some sort of species range map to be available with the Guides, and NYNHP staff have since been working on this task.

NYNHP and DOT have also been discussing augmentation of the management sections of the Guides. It is hoped that the gap between DOT staff knowledge and activities, and NYNHP biological expertise can be bridged by using the Guides to address specific DOT functions as they relate to NYNHP species and natural communities. A frequent example brought up during these discussions is DOT maintenance activities such as mowing roadsides. How does DOT currently schedule mowing roadsides? Once NYNHP knows more about this activity, could there perhaps be a better time to mow – both time of year and time of day? It is believed by both partners that a more specific and detailed management section for the Guides will greatly aid efforts to protect species of greatest conservation need and the habitats that support them.  In addition, completely new guides are needed for the most vulnerable species that only occur outside the Hudson River Basin, Long Island, and New York City.

## ACKNOWLEDGEMENTS

## BIOGRAPHICAL SKETCH

After receiving a Bachelor's degree in engineering and serving a brief stint as a Field Engineer in the semiconductor industry, **John Schmid** despised wearing a clean-suit and therefore went back to school to earn a Master of Science degree in Environmental Science at the University of New Haven. From there he held municipal and regional planning positions in Connecticut and Massachusetts, with an emphasis in environmental planning and geographic information systems (GIS). John has been a GIS Specialist for the New York Natural Heritage Program since 2000. This position has allowed him to utilize a diverse skill-set across the full gamut of GIS technology-tasks, from simple mapping to scripting and modeling.

John lives near extended family in the beautiful landscape of the Hudson Valley in upstate New York, with his wife and two daughters. John enjoys archery, hunting, mechanical tinkering, home improvement, and especially spending time with his girls - camping, fishing, and dressing up like a princess (but not usually all at the same time).

## APPENDIX A: NYNHP IMPORTANT AREA MODELS

| MODEL NAME | SPECIES |
| --- | --- |
| Basic Lacustrine 1 | Banded Sunfish, Blackwater Bluet, Comet Darner, Common Sanddragon, Eastern Pondmussel, Four-spotted Pennant, Golden-winged Skimmer, Little Bluet, Mantled Baskettail, Needham's Skimmer, New England Bluet, Pine Barrens, Bluet, Rambur's Forktail, Scarlet Bluet, Southern Sprite, Spatterdock Darner, Swamp Darter, Yellow-sided Skimmer |
| Basic Lacustrine 1 (Historical) | Banded Sunfish, Blackwater Bluet, Comet Darner, Common Sanddragon, Eastern Pondmussel, Golden-winged Skimmer, Little Bluet, Mantled Baskettail, Needham's Skimmer, New England Bluet, Pine Barrens, BluetRambur's Forktail, Scarlet Bluet, Southern Sprite, Spatterdock Darner, Swamp Darter, Yellow-sided Skimmer |
| Basic Palustrine | Chain Fern Borer Moth, Hessel's Hairstreak, Marsh Fern Moth, Pitcher Plant Borer Moth, Prothonotary Warbler |
| Common Tern Foraging Area | Common Tern |
| Common Tern Foraging Area (Historical) | Common Tern |
| Ambystoma tigrinum (Tiger Salamander) | Tiger Salamander |
| Ambystoma tigrinum (Tiger Salamander) (Historical) | Tiger Salamander |
| Rana sphenocephala (Southern Leopard Frog) | Southern Leopard Frog |
| Rana sphenocephala (Southern Leopard Frog) (Historical) | Southern Leopard Frog |
| Basic Palustine- 1 km clip | Hessel's Hairstreak, Chain Fern Borer Moth, Pitcher Plant Borer Moth |
| Beaches | Piping Plover |
| Beaches (Historical) | Piping Plover |
| Beaches: Piping Plover (Chick Foraging) | Piping Plover |
| Beaches: Piping Plover (Chick Foraging) (Historical) | Piping Plover |
| Cicindela hirticollis (Hairy-necked Tiger Beetle) | Hairy-neckedTiger Beetle |
| Wetland Birds | Least Bittern, Pied-billed Grebe |
| Kinosternon subrubrum (Eastern Mud Turtle) | Eastern Mud Turtle |
| Grassland/Marsh Raptors | Barn Owl, Northern Harrier, Short-eared Owl |
| Grassland/Marsh Raptors (Historical) | Northern Harrier, Short-eared Owl |
| Beach/Wetland Colonial Waterbirds | Black Skimmer, Common Tern, Gull-billed Tern, Roseate Tern |
| Beach/Wetland Colonial Waterbirds (Historical) | Black Skimmer, Common Tern, Gull-billed Tern, Roseate Tern |
| Least Tern, Roseate Tern, Black Skimmer Foraging Area | Least Tern, Roseate Tern, Black Skimmer |
| Least Tern, Roseate Tern, Black Skimmer Foraging Area (Historical) | Least Tern, Roseate Tern, Black Skimmer |
| Menidia beryllina (Inland Silverside) | Inland Silverside |
| Atlantic Silverside | Atlantic Silverside |
| Scaphiopus holbrookii (Eastern Spadefoot) | Eastern Spadefoot |
| Species Represented by EO Only | A Noctuid Moth, Aureolaria Seed Borer, Marsh Fern Moth, Peregrine Falcon, Richard's Fungus Moth |
| Terrestrial Reptiles 1 | Fence Lizard, Wormsnake |
| Grassland birds | Upland Sandpiper |
| Woodland birds | Kentucky Warbler |

# APPENDIX A: NYNHP IMPORTANT AREA MODELS (CONITINUED)

| MODEL NAME | SPECIES |
|---|---|
| Woodland/Shrubland birds | Chuck-will's-widow |
| Evergreen Forest Lepidoptera | Pine Devil, A Geometrid Moth (Citheronia sepulcralis) |
| Deciduous Forest Lepidoptera | Tawny Emperor, White-m Hairstreak, Red-banded Hairstreak |
| Understory Foodplant Lepitoptera associated with Openings | A Hand-maid Moth, A Moth (Lepipolys perscripta), A Noctuid Moth (Hydraecia stramentosa), An Apamea Moth (Apamea burgessi), An Apamea Moth (Apamea inordinata), Bridgham's Brocade, Coastal Heathland Cutworm, Dusted Skipper, Fawn Brown Dart, Fringed Dart, Frosted Elfin, Golden Aster Flower Moth, Gordian Sphinx, Pink Sallow, Pink Star Moth, Plain Schizura, Spinose Flower Moth, Stinging Rose Caterpillar Moth, Switchgrass Dart, The Pink Streak, Toothed Apharetra, Umber Moth, Violet Dart, Waxed Sallow |
| Oak and Pine Foodplant Lepidoptera | A Prominent Moth (Heterocampa varia), Barrens Dagger Moth, Barrens Itame, Black-eyed Zale, Coastal Barrens Buckmoth, Edwards' Hairstreak, Gray Woodgrain, Herodias or Pine Barrens Underwing, Jersey Jair Underwing, Melsheimer's Sack Bearer, Pine Barrens Zale, Pine Tussock Moth, Spiny Oakworm Moth, Yellow-spotted Graylet |
| Barrens Habitat Lepidoptera | A Noctuid Moth (Chytonix sensilis), Orange Holomelina, Packard's Lichen Moth, Pale Green Pinion Moth, Pin-striped Slug Moth, Projecta Gray |
| Basic Estuarine- Salt Marsh | Forster's Tern, Seaside Dragonlet, Seaside Sparrow, Black Rail, Laughing Gull |
| Basic Estuarine- Salt Marsh (Historical) | Laughing Gull |
| Basic Estuarine- Woody Tidal | Cattle Egret, Glossy Ibis, Little Blue Heron, Snowy Egret, Tricolored Heron, Yellow-crowned Night-Heron |
| Basic Estuarine- Woody Tidal (Historical) | Cattle Egret, Glossy Ibis, Little Blue Heron, Snowy Egret, Tricolored Heron, Yellow-crowned Night-Heron |
| Wading Bird Foraging Area | Cattle Egret, Glossy Ibis, Little Blue Heron, Snowy Egret, Tricolored Heron, Yellow-crowned Night-Heron |
| Wading Bird Foraging Area (Historical) | Cattle Egret, Glossy Ibis, Little Blue Heron, Snowy Egret, Tricolored Heron, Yellow-crowned Night-Heron |
| Plants | ALL |
| Communities - Terrestrial | ALL |
| Communities - Palustrine | ALL |
| Communities - Estuarine | ALL |
| Communities - Marine | ALL |

**APPENDIX B: EXAMPLE OF CONSERVATION GUIDES**



The NY Natural Heritage Program facilitates the conservation of New York's biodiversity by providing comprehensive information and scientific expertise on rare species and natural ecosystems to resource managers and other conservation partners. The following conservation guides are designed to help land managers, decision-makers, planners, scientists, consultants, and the interested public better understand the rare species and natural communities that characterize New York. Funding from the Hudson River Estuary Program made the initial development of these guides possible.

**Search Guides**
Search
Advanced Search

**Additional Links**
Rarity Rank Definitions
Community System Descriptions
Key to Systems and Subsystems
Acknowledgements
About Us

**Animal Guides**

**Plant Guides**

**Community Guides**

Home | Advanced Search | About Us
Animal Guides | Plant Guides | Community Guides

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W3C XHTML 1.0    W3C CSS

**APPENDIX B: EXAMPLE OF CONSERVATION GUIDES (CONTINUED)**

**APPENDIX B: EXAMPLE OF CONSERVATION GUIDES (CONTINUED)**

New York **Natural Heritage Program**

HOME | ANIMAL GUIDES | PLANT GUIDES | COMMUNITY GUIDES | ADVANCED SEARCH

Summary | Conservation and Management | Habitat | Range | Identification Comments | Taxonomy | Additional Resources

## Tiger Salamander

*Ambystoma tigrinum* (Green, 1825)

**Amphibians**

🖶 Printer Friendly Version (PDF)

**Family:** Mole Salamanders (Ambystomatidae)

**State Protection:** Endangered
**Federal Protection:** Not Listed

**State Rarity Rank:** S1
**Global Rarity Rank:** G5

**Did you know?**
In addition to producing noxious secretions, tiger salamanders are able to use their tails to lash out at predators (Brodie 1977).

Ambystoma tigrinum

NYS Department of Environmental Conservation

### State Ranking Justification [-]

All tiger salamanders in New York belong to the subspecies Ambystoma tigrinum tigrinum, a unique coastal plain lineage of tiger salamanders that is declining (Church et al. 2003). In addition to being listed as endangered in New York, the subspecies is listed as endangered in the neighboring urbanized states of New Jersey, Delaware, Virginia and Maryland, and it was extirpated from Pennsylvania in the early 1900s (Hulse et al. 2001). In New York, the tiger salamander's range is confined to Long Island, where the development pressure is intense, resulting in highly fragmented islands of suitable habitat. Among the 124 documented breeding locations on the island, surveyors have failed to find tiger salamanders during recent surveys at over a third, another third have viability rankings of fair or poor, and just 13% are considered to support populations with excellent or good viability. The statewide population has been steadily declining since 1980.

### Short-term Trends [-]

The Long Island population of tiger salamanders is one of the most intensively studied animal populations in the state. It has been closely monitored by the NYSDEC with the assistance of independent contractors since the early 1990s, and volumes of data are currently available for approximately 115