

Natural Heritage Important Areas

Overview

What Important Areas are

Natural Heritage Important Areas (IAs) are lands and waters that support the continued presence and quality of populations of rare animals and rare plants, and of rare or high-quality ecological communities. Important Areas are designed to assist local land use decision makers in their planning by delineating those areas that can play a role in the protection and conservation of biological resources.

IAs are derived using GIS Important Area models applied to known locations of rare plants and animals and significant natural communities that are documented as element occurrences in the New York Natural Heritage (NYNHP) database, or applied to observation locations of other species obtained from other sources. IA models are specific to a species or species group, and are based on the life histories, movement patterns, and habitat requirements of that species or species group; for natural communities, models are based on the community type's size and natural ecological processes. The IA models generate Important Areas around the specific locations where the animals, plants, and/or ecological communities have been observed. The IAs include:

- additional habitat for the rare animal and plant populations, including areas which may be used by rare animals for breeding, nesting, feeding, roosting, over-wintering/hibernating, or daily or seasonal movement.
- areas that support the natural ecological processes critical to maintaining the quality of these plant and animal habitats and of these significant communities.
- areas where human activities could impact these species or significant communities.

Documentation of the methodologies and justifications (based on the life histories and habitats of each species or species group) used for each animal IA model and for the plant and natural community IA models are available upon request.

In 2018, NYNHP generated Important Areas (IAs) for 1901 rare animal, rare plant, and significant natural community occurrences within the full extent of the ten counties in the Hudson River Valley and within the full extent of the tidal Hudson River watershed, including 306 occurrences that were entered since 2013. NYNHP also generated IAs for 674 locations of two other herp species and for 2263 locations of wild brook trout.

The Town of Highlands in Orange County has 68 species and community types generating IAs, the highest number in the project area.



What Important Areas are not -- Limitations

Important Areas:

- Are developed only around known locations of rare species and significant communities, but include areas where these species and communities have not been observed.
- Do not include all potential habitat that may exist in an area. IAs are based on best available information, but do not represent a comprehensive inventory of an area's resources or habitats. Lands outside IAs may also support rare animals and plants and significant communities, or provide ecological benefits.
- Do not include all ecologically significant resources in an area, such as large forest blocks (they include only rare species and natural communities).
- Do not have crisp boundaries. The boundary of a GIS feature does not translate to a definite clear boundary on the ground.
- Do not mean that no human activity should occur within them; some parts of the IAs may support some human activities with little or no impact to rare species or significant communities.
- Have no regulatory or permitting authority.

Important Area GIS Data

The Important Area spatial layers are organized into the following 8 feature classes in a file geodatabase. Each of these feature classes has Important Areas generated by a different set of IA models. In the version available for public download, the individual Important Areas in each feature class have been dissolved, and there are no attributes indicating the specific species or community type contributing to a given IA.

Important_Areas_HRV_2018_diss_public.gdb

- **IA_Plants** – IAs generated by rare plant occurrences
- **IA_Natural_Communities** – IAs generated by natural community occurrences
- **IA_Animals_Aquatic** – IAs generated by rare animal occurrences using aquatic habitat-based models
- **IA_Animals_Wetland** – IAs generated by rare animal occurrences using wetland habitat-based models
- **IA_Animals_Terrestrial** – IAs generated by rare animal occurrences using terrestrial habitat-based models
- **IA_Animals_Bat_Foraging** – IAs generated for Indiana and Northern long-eared bat foraging, staging, and swarming areas
- **IA_Animals_Coldwater_Stream_Habitat** – IAs generated from wild brook trout locations
- **IA_Animals_Diadromous_Fishes** – IAs generated from diadromous (migrating) fish locations



The assignment of an animal IA into one of either aquatic, wetland, or terrestrial feature classes is based on the IA model used, not on the specific species itself. For example, Northeastern tiger beetle is a terrestrial animal but lives on the cobble shores and islands of rivers; therefore, its IAs are modeled by a riverine model and are included in the IA_Animals_Aquatic feature class.

The feature class IA_Animals_Bat_Foraging includes the full (dissolved) IAs for Indiana and Northern long-eared bat summer foraging, spring staging and fall swarming areas. Since these IAs cover such large areas, it was decided to place them into their own feature classes.

One use of the IA_Animals_Bat_Foraging feature class is to display it with lighter, more transparent symbology to indicate there is still conservation value to those areas without overwhelming the entire map area or the other Important Areas.

Due to the distinctive and extensive nature of the Important Areas generated for wild brook trout (coldwater stream habitat) and for diadromous fishes not tracked as occurrences by NYNHP, these IAs have been separated into their own feature classes to aid in display on maps and on screen.

Background Information

Occurrences used to generate Important Areas

(For an explanation of Natural Heritage occurrences, or EOs, and methodology, see *Appendix A: Natural Heritage Methodology, and Rare Species and Significant Natural Community Occurrences*).

In the NYNHP database, as of April 15, 2018, there were 1313 occurrences of rare and listed animals, 1260 occurrences of rare plants, and 479 occurrences of significant natural communities within the full extent of the ten counties in the Hudson River Valley and within the full extent of the tidal Hudson River watershed.

All occurrences were assessed for appropriateness as valid input for an IA model. Occurrences were eliminated for the following reasons.

- Uncertainty about current presence: extirpated and historical records (historical generally defined as last observed before 1980).
- Low likelihood of current presence: last observed since 1980, but more recent surveys have failed to find the species (for birds, e-Bird records were consulted to assist in this assessment); or habitat at site is significantly degraded or altered.
- Low mapping precision.
- Occurrence of a species is an observation in unsuitable habitat, such as a turtle found crossing a road or a dragonfly found on the deck of a private residence.
- Identification of the species is uncertain or not confirmed.
- Information on the occurrence is otherwise incomplete.

Following the precedent set in the two previous Hudson River Valley Important Area projects, mosses, waterfowl winter concentration areas, and anadromous fish concentration areas in the Natural Heritage database were not included in IA modelling.



For timber rattlesnakes, only hibernacula occurrences were used as input to models. Other types of occurrences include foraging areas, basking/shedding areas, and gestation/birthing areas. No separate IAs were generated for these other types of occurrences because the IA model for rattlesnake hibernacula provides for habitat for these other types of areas around hibernacula; the documented locations of these types of areas are generally captured within the IAs generated around hibernacula; and it is not feasible to model an isolated area without a known nearby hibernaculum to serve as a source of the snakes.

For breeding bald eagles, only nest locations were modeled. There are also some eagle occurrences in the Natural Heritage database depicting foraging areas around a nest. However, the IA model for bald eagle nests already includes surrounding area for foraging, so it was not necessary to also model the few foraging occurrences.

Following the review of occurrences and elimination of unsuitable ones, 1892 occurrences remained as input to IA models. Nine additional occurrences of timber rattlesnakes very close to the New York border in adjacent states were obtained from New Jersey, Connecticut, and Massachusetts in 2008; these were again used as input to the timber rattlesnake IA model.

NYNHP also generated Important Areas for selected species for which NYNHP does not maintain occurrences: wood turtle, eastern box turtle, wild brook trout, and diadromous fishes. (Wild brook trout are defined as trout that are successfully reproducing and maintaining a population without stocking.) IAs had been generated for these species in 2011 for another project.

For the two turtles, observation data from the New York State Amphibian & Reptile Atlas Project (NYSDEC) and the Metropolitan Conservation Alliance was reviewed. Additional wood turtle locations were provided by NYSDEC. For this project, 386 observations of eastern box turtle and 288 observation of wood turtle were used as input to IA models.

NYSDEC Bureau of Fisheries provided locations of wild brook trout and diadromous fishes in 2011 for the culverts project. The Bureau of Fisheries provided additional wild brook trout locations for the project area for this project. 2263 observations of brook trout (many from the same locations) were used as input to the wild brook trout IA model.

No additional observations of diadromous fish (blueback herring, alewife, American shad, and American eel) were obtained for this project. The diadromous fish IAs derived for the 2011 project are included in the IA geodatabase for this project.

Important Area Models

Important Areas are delineated using GIS models that use the specific locations (occurrences) where animals, plants, and/or ecological communities have been observed as input.

Documentation of the methodologies and justifications (based on the life histories and habitats of each species or species group) used for each animal IA model and for the plant and natural community IA models are available upon request.

For natural communities, there are six IA models for different ecological systems: terrestrial, palustrine (freshwater non-tidal wetland), riverine, estuarine, marine, and one just for



the Hudson River tidal river. In general, an IA for a natural community is a buffer around the community occurrence designed to include areas that support the natural ecological processes contributing to the quality of that natural community and that act as a buffer to the impacts of human disturbance. The buffer distance is not constant around the occurrence, but varies depending on wetland vs. upland habitat, proportion of forest land cover around the occurrence, slope and aspect, and soil erodibility.

The IA for a plant or animal is generated by capturing all the appropriate habitat or land cover (e.g. wetlands) within a certain distance of the occurrence, and all similar habitat or land cover contiguous to that within the buffer, and then buffering those areas with the distances used in the corresponding natural community IA models. Models for animals in aquatic habitat pull in areas upstream and downstream of the occurrence, plus adjacent riparian areas out to a distance determined by the community models.

Animal occurrences are also buffered where appropriate by a distance that incorporates areas used by the species for breeding, nesting, feeding, roosting, over-wintering/hibernating, or daily or seasonal movement (based on how far individuals of that species move on a regular basis).

As an example of an animal IA, the IAs for bog turtle and Blanding's turtle include the full extent of all wetlands that are within or partially within 1 km of the known occurrence, plus a buffer around these wetlands of at least 163 m that would contribute to maintaining favorable water quality and flow in the wetlands. (Even if the wetland is only partially within 1 km, the whole wetland will be included in the Important Area, even those portions more than 1 km away.) In addition, Blanding's turtles Important Areas include all uplands within 1 km of the known location, since this species leaves wetlands to nest in adjacent uplands. For both species, areas separated from the occurrence by major roads that can act as barriers are not included.

There is one IA model for rare plants, which handles both wetland and terrestrial species.

There are many IA models for rare animals. Some species, such as bog turtle and Blanding's turtle, have their own IA model. Other IA models apply to species groups, such as wetland birds or floodplain forest Lepidoptera. Some species have different models for different life history types of occurrences; e.g., Indiana and Northern long-eared bat each have different IA models for hibernaculum locations vs. summer roost locations, and bald eagles have different IA models for nest locations vs. wintering locations.

Indiana and Northern Long-eared bats (IA_Animals_Bat_Foraging): The base distance used in IA models for these species are 2.5 miles around Indiana bat hibernacula and summer roosts; 1.5 miles around Northern long-eared bat summer roosts; and 5 miles around Northern long-eared bat hibernacula. These distances capture those areas used for foraging by bats at the summer roosts; and those areas around hibernacula used by bats for spring staging just after emerging from the hibernaculum and for autumn swarming just before entering the hibernaculum for the winter. The main impact of concern for bats within these areas is the removal of potential roost trees. (To protect the mine or cave itself that serves as a hibernaculum, or the tree itself that serves as a summer roost, NYSDEC recommends protecting the area within .25 mile of the hibernaculum or roost.)



Appendix A: Natural Heritage Methodology, and Rare Species and Significant Natural Community Occurrences

In its work facilitating the conservation of New York’s biodiversity, the New York Natural Heritage Program collects and manages data on certain “elements of biodiversity”: rare animal species, rare plant species, and significant natural community types. These elements comprise a “coarse filter/fine filter” approach to identifying and prioritizing the protection of special biological resources. Natural Heritage Programs, NatureServe, and The Nature Conservancy have spent more than two decades developing and refining this approach, which is used internationally by the Natural Heritage Network.

An ecological community is an assemblage of interacting plant and animal populations that share a common environment; the particular assemblage of plant and animal species occurs across the landscape in areas with similar environmental conditions. A natural community is an ecological community that occurs naturally in the landscape, and is not created, maintained, or substantially modified by human activity. Examples of natural community types include deep emergent marsh, red maple-hardwood swamp, dwarf shrub bog, hemlock northern-hardwood forest, and tidal creek. New York Natural Heritage has classified the natural landscape of New York into 181 natural community types (Reschke 1990, Edinger *et al.* 2014). Freshwater wetland, estuarine, and upland ecological community types are classified according to their dominant vegetation and their physical setting; aquatic, marine, and cave ecological community types are classified according to their physical setting and their dominant flora and fauna. Descriptions of many of New York’s natural community types are available in our Conservation Guides at www.guides.nynhp.org. More technical descriptions of all community types are in the most recent edition of *Ecological Communities of New York State* (Edinger *et al.* 2014) at www.dec.ny.gov/animals/97703.html.

Natural communities serve as habitat for a wide range of plants and animals, both rare and common, and therefore represent a “coarse filter” for biodiversity conservation. The conservation of the highest-quality remaining examples of natural communities in an area will also conserve most of the species that make up the biological diversity of that area. (Natural communities in good condition also support intact ecological processes and provide ecological services.)

Rare animals and plants often have narrow or unusual habitat requirements. These species may “fall through” the coarse filter, and are sometimes not protected within representative communities. Identifying and documenting viable populations of each of the rare species in the state serves as the “fine filter” for protecting New York’s biological diversity.

In documenting and managing information on the locations of natural communities, rare animals, and rare plants (our target elements of biodiversity), New York Natural Heritage uses *element occurrences*. An element occurrence is an area of land and/or water in which a species or community has been documented as regularly occurring over a period of time. An element occurrence is made up of one or more individual observations, which are mapped to the most accurate locational information available.

New York Natural Heritage collects, maps, and maintains records of all occurrences of the state’s rarest and most imperiled plants and animals. These include species listed as Endangered and Threatened by New York State and/or the federal government, as well as



species that have not yet gone through the regulatory listing process, but have been determined by Natural Heritage biologists to be rare or imperiled in New York. New York Natural Heritage also maintains records of selected significant concentration areas of groups of animal species, such as colonies of hibernating bats and raptor wintering areas.

New York Natural Heritage also collects, maps, and maintains occurrences of natural communities that meet documented, objective criteria for significance from a statewide perspective. These include occurrences of rare community types, and occurrences of more common community types that are of high quality in terms of size, undisturbed and intact condition, and landscape context (see below).

New York Natural Heritage's database now has more than 14,100 element occurrences.

