

A photograph of a pond with a turtle in the center. The turtle has a dark shell and a red stripe on its head. It is surrounded by green algae and reeds. In the background, a small blue frog is visible on the left side. The water is calm, reflecting the surrounding greenery.

Natural Resource Guide

**Village of Union Springs
Local Waterfront
Revitalization Program**



Prepared for the Village of Union Springs by a Local Waterfront Advisory Committee with assistance from the Cayuga County Department of Planning & Economic Development



This waterfront revitalization project was prepared with funding provided by the New York State Department of State under Title 11 of the Environmental Protection Fund.

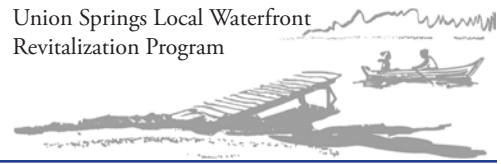


TABLE OF CONTENTS

NYS CONSERVATION RESOURCE GUIDES- FISH & MAMMALS	pg. 1
NYS CONSERVATION RESOURCE GUIDES- BIRDS	pg. 15
NYS CONSERVATION RESOURCE GUIDES- PLANTS	pg. 83



NYS CONSERVATION RESOURCE GUIDES- FISH & MAMMALS

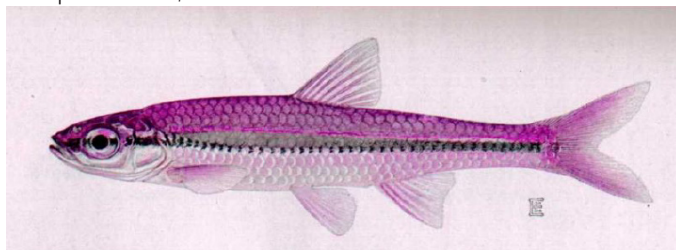
This section contains conservation resource guides from the NY Natural Heritage Program for the Blackchin Shiner fish and the Northern Long-eared Bat which have been found in the Village of Union Springs Local Waterfront Revitalization Area.

Note: The format and pagination of the conservation guides has been modified to reduce the number of overall pages in this document; however, the content of the guides is exactly as produced by the NY Natural Heritage Program including any spelling or grammatical errors.



Blackchin Shiner

Notropis heterodon, blackchin shiner



Scientific Name *Notropis heterodon*
(Cope, 1865)

Family Name Cyprinidae
minnows and carps

Did you know?

A low tolerance to salt makes the blackchin shiner a good indicator of water quality (Smith 1985; Carlson 1998).

Summary

Protection Not listed in New York State, not listed federally.

This level of state protection means: The species is not listed or protected by New York State.

Rarity G5, S1

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery. A state rarity rank of S1 means: Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology makes it especially vulnerable in New York State.

Conservation Status in New York

The Blackchin shiner has all but disappeared from the southern New York watersheds. Their numbers are declining in the Susquehanna and Allegheny watersheds. Currently they are frequently found in the lakes and streams of the St. Lawrence watershed and bays of eastern Lake Ontario. More information is needed regarding the ecological requirements of this species (Carlson 1998, 2005; Keeler 2006).

Short-term Trends

Currently found in at least seven New York watersheds (about 25 waters) including a recent discovery in the Niagara River, the blackchin shiner is most abundant in the stream and lakes of Jefferson County, the St. Lawrence River, and several bays of eastern Lake Ontario. They are declining or absent in southern watersheds where this species was once abundant (Carlson 1998, 2005; Bureau of Fisheries, New York State Department of Environmental Conservation 2008; New York Natural Heritage Program 2008). More sampling is needed to determine the status of this species in the southern watersheds, since many of these sites have not been surveyed regularly.

Long-term Trends

Historically found in 11 of 19 watersheds (about 98 waters) including several southern and eastern watersheds where it is currently absent or declining (Lake Erie, Allegheny, and Upper Hudson), as well as the bays and creeks off the southern shore of Lake Ontario (Carlson 1998, 2005).

Conservation and Management

Threats

Possible threats include fluctuating water levels and habitat loss due to increased siltation (Smith 1985; Carlson 1998, 2005). A better understanding of the life history and ecological requirements of the blackchin shiner is needed.

Conservation Strategies and Management Practices

Survey inland lakes and resurvey historical locations to better determine the status of the blackchin shiner in New York and continue to monitor current populations for changes in abundance (Carlson 1998, 2005).



Research Needs

More information is needed regarding life history, behavior, habitat, and ecological requirements of the blackchin shiner, and the reasons why this species is declining or absent from the southern watersheds of New York (Carlson 1998, 2005).

Habitat

Blackchin shiners can be found in cool, clear, and shallow sections of lakes and slow regions of streams with weedy vegetation, very little siltation, and a sandy substrate (Smith 1985; Page and Burr 1991).

Associated Ecological Communities

Deepwater River

The aquatic community of very large, very deep, quiet, base level sections of streams with a very low gradient. In places the water is deep enough so that light cannot reach the river bottom.

Great Lakes Aquatic Bed

The aquatic community of the protected shoals of the Great Lakes or Lake Champlain. They occur in quiet bays that are protected from extreme wave action by islands, shoals, or barrier bars, and typically support large areas of "weeds" or aquatic macrophytes.

Marsh Headwater Stream

The aquatic community of a small, marshy perennial brook with a very low gradient, slow flow rate, and cool to warm water that flows through a marsh, fen, or swamp where a stream system originates. These streams usually have clearly distinguished meanders (i.e., high sinuosity) and are in unconfined landscapes.

Other Probable Associated Communities

Mesotrophic dimictic lake

Oligotrophic dimictic lake

Associated Species

Iowa Darter (*Etheostoma exile*)

Eastern Sand Darter (*Etheostoma pellucidum*)

Pugnose Shiner (*Notropis anogenus*)

Blackchin Shiner (*Notropis heterodon*)

Identification Comments

Identifying Characteristics

The blackchin shiner is a small minnow, typically five to seven cm in length. A black mid-lateral stripe runs across the body from the base of the tail, through the large eye, to the tip of the pointy snout, lower jaw, and chin. The pores of the lateral line are black, giving the dark line a zigzag pattern. A yellowish stripe runs above the dark stripe. Above the stripe, the body is brown-olive; below the stripe, the belly is pale yellow-white with a few dark speckles. The base of the anal fin is dark and has eight rays. The scales on the back are edged in black. The rays of the fins and forked tail are dark. There is one dorsal fin which is angled posteriorly. The pharyngeal teeth arrangement is 1,4-4,1 (two rows of teeth, four teeth in the inner row and one tooth in the outer row). Males during breeding season become golden yellow and develop tubercles on the top of the head and pectoral fins (Scott and Crossman 1973; Smith 1985; Page and Burr 1991).

Characteristics Most Useful for Identification

The zigzag pattern of the mid-lateral stripe, the stripe extending to the lips and chin, and the pharyngeal teeth arrangement are useful characteristics in distinguishing blackchin shiners from other shiners (Smith 1985; Page and Burr 1991).



Best Life Stage for Identifying This Species

Adults exhibit the characters useful in identifying this species properly.

Behavior

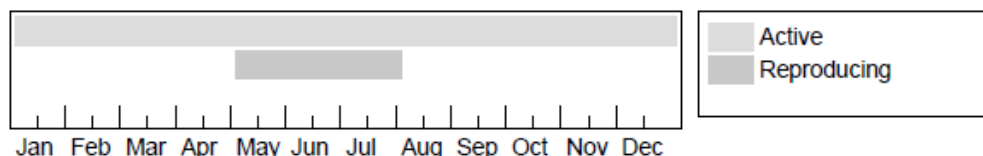
Little is known about the life history and behavior of the blackchin shiner other than spawning times are between May and July (Scott and Crossman 1973; Smith 1985).

Diet

Blackchin shiners feed on small crustaceans in the water column and small flying insects at the water's surface (Scott and Crossman 1973; Smith 1985).

The Best Time to See

Blackchin shiners are present year-round and are spawning from May to the end of July (Scott and Crossman 1973; Smith 1985).



The time of year you would expect to find Blackchin Shiner in New York.

Similar Species

Ironcolor Shiner (*Notropis chalybaeus*): The mid-lateral line on the ironcolor shiner does not extend to the chin. The inside of the mouth is dark (Smith 1985; Page and Burr 1991).

Bridle Shiner (*Notropis bifrenatus*): The bridle shiner has a larger eye than the blackchin shiner, seven rays in the anal fin, and a 4,4 pharyngeal tooth arrangement (Smith 1985; Page and Burr 1991).

Pugnose Shiner (*Notropis anogenus*): The pugnose shiner has a tiny and almost vertically-oriented mouth and more rounded snout (Smith 1985; Page and Burr 1991).

Taxonomy

Kingdom Animalia
└ **Phylum** Craniata
└ **Class** Ray-finned Fishes (Actinopterygii)
└ **Order** Minnows and Suckers (Cypriniformes)
└ **Family** Cyprinidae (minnows and carps)

Additional Resources

Links

NatureServe Explorer

<http://natureserve.org/explorer/servlet/NatureServe?searchName=NOTROPIS+HETERODON>

Google Images

<http://images.google.com/images?q=NOTROPIS+HETERODON>

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- New York State Office of Parks, Recreation and Historic Preservation



Northern Long-eared Bat



Scientific Name *Myotis septentrionalis*
(Trovessart, 1897)

Family Name Vespertilionidae
Evening Bats and Vesper Bats

Did you know?

Northern myotis (*Myotis septentrionalis*), also referred to as the northern long-eared bat, is one of three different species with a similar common name. Long-eared myotis (*Myotis evotis*) occur in western North America and brown long-eared bats (*Plecotus auritus*) occur in Europe. Records previously referring to Keen's myotis (*Myotis keenii*) in New York and eastern North America, are now known to be northern myotis which was first recognized as a distinct species, rather than a subspecies of Keen's Myotis, in 1979 (Van Zyll De Jong 1979).

Summary

Protection Threatened in New York State, Threatened federally.

This level of state protection means: A native species likely to become an endangered species within the foreseeable future in New York (includes any species listed as federally Threatened by the United States). It is illegal to take, import, transport, possess, or sell an animal listed as Threatened, or its parts, without a permit from NYSDEC. 1) Any native species likely to become an endangered species within the foreseeable future in New York. 2) Any species listed as threatened by the U.S. Department of the Interior.

This level of federal protection means: Listed as Threatened in the United States by the US Department of Interior.

Rarity G1G2, S1

A global rarity rank of G1G2 means: Critically Imperiled or Imperiled globally - At very high or high risk of extinction due to rarity or other factors; typically 20 or fewer populations or locations in the world, very few individuals, very restricted range, few remaining acres (or miles of stream), and/or steep declines. More information is needed to assign a single conservation status. A state rarity rank of S1 means: Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology makes it especially vulnerable in New York State.

Conservation Status in New York

Northern myotis were relatively common in New York prior to the first appearance of white-nose syndrome (WNS) in 2006. They have since declined dramatically with only an estimated 2% of the pre-WNS population numbers remaining in 2012 (NYSDEC 2012). The northern myotis is now one of the least commonly encountered species during winter hibernacula surveys (NYSDEC unpublished data).

Short-term Trends

Northern myotis have declined approximately 99% since white-nose syndrome began in New York in 2006 through 2015. Similar declines have occurred in the northeastern part of their range (Turner et al. 2011; U.S. Fish and Wildlife Service 2013). Numbers dropped from 911 to only 18 individuals counted among 36 hibernacula sites repeatedly surveyed from 2007-2012 (NYSDEC 2012). These numbers do not represent complete counts of the statewide population, however, since this species may roost individually and in crevices prohibiting a complete count of the remaining population.

Long-term Trends

The long-term trends were presumed to be stable or increasing prior to the appearance of white-nose syndrome in 2006 (C. Herzog pers. comm.).

Conservation and Management

Conservation Overview

The northern myotis is primarily associated with uplands and mature interior forests. Populations in New York and the eastern U.S. are threatened by white-nose syndrome. Due to the potential for continued rangewide declines from white-nose syndrome, the northern myotis has been proposed for listing as an endangered species under the Endangered Species Act (U.S. Fish and Wildlife Service 2013). Other threats to this species include incompatible forest management practices, development, habitat fragmentation, and environmental toxins.

Threats

By far the largest threat to northern myotis in New York is white-nose syndrome (WNS) which was first discovered among bats in a cave in Schoharie County, New York in 2006. White-nose syndrome is caused by a fungus *Pseudogymnoascus destructans* (previously *Geomyces destructans*) that is often visible on the bats' muzzle and wings (Blehert et al. 2009). The fungus may invade hair follicles and cause lesions under the skin (Blehert et al. 2009). Bats wake from hibernation to groom and consequently burn fat reserves that are needed to survive the winter and they become emaciated (Blehert et al. 2009). Extensive damage to their wing membranes and dehydration may also be contributing factors to mortality (U.S. Fish and Wildlife Service 2013).

Some forest management practices may not be compatible with this species. Since northern myotis are adapted to exploit mature interior forest, harvests that remove significant canopy cover can reduce habitat for this species. The 90-day finding on the petition to list the northern myotis under the Endangered Species Act cited direct and indirect effects of logging as a threat to this species (U.S. Fish and Wildlife Service 2011). Direct mortality could occur when felled live trees contain colonies or roosting individuals and timber management may reduce or fragment the mature interior forest habitat required by this species. Similarly, development can also fragment forests making them unsuitable for this species.

Bats may be particularly sensitive to environmental toxins including those found in herbicides and pesticides. Although no studies have targeted northern myotis directly, elevated levels of persistent organic pollutants including especially PCBs, DDT, Chlordanes, and PBDEs have been found in a similar species, the little brown bat, in the Hudson River Valley in New York (Kannan et al. 2010). The levels found in the bats were only 1 to 3 times less than lethal concentrations reported from previous studies (Kannan et al. 2010). Lesser toxin levels may be expected in northern myotis since little brown bats typically consume a greater percentage of prey with an aquatic life stage. Bats are highly susceptible to DDT residue and this chemical was widely used as a pesticide to control bat infestations in houses in the 1940s (USGS 2013). It was widely used as an agricultural pesticide in the 1950s and 60s until its agricultural use was banned in 1972. Since DDT is highly persistent (soil half-life is 2-15 years, aquatic half-life is about 150 years) (NPIC 1999), it can pose a threat to bats when there is exposure to trace residues in the environment (USGS 2013). Extensive applications of insecticides and some bio control methods, such as Btk, could also pose an indirect risk to northern myotis by reducing availability of prey.

If proper precautions are not used, cavers and researchers entering hibernacula may cause disturbance that rouses bat colonies or transport the fungus that causes WNS on their clothing (NatureServe 2013). Other potential threats may include climate change, commercial cave development, flooding and hibernacula collapse; habitat loss and fragmentation from development, hydraulic fracturing, and construction of new wind facilities; and direct mortality from wind facilities (U.S. Fish and Wildlife Service 2013).



Conservation Strategies and Management Practices

Gating mines and caves can prevent human entry while allowing the bats unobstructed access. Following proper specifications and monitoring bat populations before and after gate installation are important, however, as gating can affect the airflow and temperature in the cave, making areas of the cave uninhabitable for certain species (U.S. Fish and Wildlife Service 2013). Buildup of debris at cave entrance gates may have the same effect (U.S. Fish and Wildlife Service 2013). Retaining large trees and unfragmented blocks of late-seral stage forests of mixed age classes may be important for this species. Harvests that substantially reduce the forest canopy may not be compatible with habitat management for this species.

Development and Mitigation Considerations

Retaining snags and dying trees can provide summer roosting habitat for northern myotis. Retaining overhead canopy, mature trees, and minimizing fragmentation of mature patches may also be important.

Research Needs

Research is needed to document summer roost locations in New York and to determine the extent of local populations. Ongoing winter hibernacula surveys are needed to monitor trends of the remaining populations.

Regional Conservation Needs

Conservation needs have not yet been assessed for this species in New York. The current distribution of northern myotis in the state, as well as identification of summer locations with the highest local abundances are needed prior to determining specific management and conservation needs.

Habitat

Northern myotis are typically associated with mature interior forest (Carroll et al. 2002) and tend to avoid woodlands with significant edge habitat (Yates and Muzika 2006). Northern myotis may most often be found in cluttered or densely forested areas including in uplands and at streams or vernal pools (Brooks and Ford 2005). Northern myotis may use small openings or canopy gaps as well. In one study in northwestern South Carolina, detection of northern myotis was best predicted in mature stands but also in areas with sparse vegetation (Loeb and O'Keefe 2006). Some research suggests that northern myotis forage on forested ridges and hillsides rather than in riparian or floodplain forests (Harvey et al. 1999). Captures from NY suggest that northern myotis may also be found using younger forest types (NYSDEC unpublished data). Northern myotis select day roosts in dead or live trees under loose bark, or in cavities and crevices, and may sometimes use caves as night roosts (U.S. Fish and Wildlife Service 2013). They may also roost in buildings or behind shutters. A variety of tree species are used for roosting. The structural complexity of surrounding habitat and availability of roost trees may be important factors in roost selection (Carter and Feldhamer 2005). Roosts of female bats tend to be large diameter, tall trees, and in at least some areas, located within a less dense canopy (Sasse and Pekins 1996). Northern myotis hibernates in caves and mines where the air temperature is constant, preferring cooler areas with high humidity (U.S. Fish and Wildlife Service 2013).

Associated Ecological Communities

Acidic Talus Slope Woodland

An open to closed canopy woodland that occurs on talus slopes (slopes of boulders and rocks, often at the base of cliffs) composed of non-calcareous rocks such as granite, quartzite, or schist.

Allegheny Oak Forest

A hardwood forest that occurs on well-drained sites in the unglaciated portion of southwestern New York. This is a forest of mixed oaks with a diverse canopy and richer ground flora than other oak communities in the state.



Appalachian Oak-hickory Forest

A hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants. The dominant trees include red oak, white oak, and/or black oak. Mixed with the oaks, usually at lower densities, are pignut, shagbark, and/or sweet pignut hickory.

Appalachian Oak-pine Forest

A mixed forest that occurs on sandy soils, sandy ravines in pine barrens, or on slopes with rocky soils that are well-drained. The canopy is dominated by a mixture of oaks and pines.

Beech-maple Mesic Forest

A hardwood forest with sugar maple and American beech codominant. This is a broadly defined community type with several variants. These forests occur on moist, well-drained, usually acid soils. Common associates are yellow birch, white ash, hop hornbeam, and red maple.

Calcareous Talus Slope Woodland

An open or closed canopy community that occurs on talus slopes composed of calcareous bedrock such as limestone or dolomite. The soils are usually moist and loamy; there may be numerous rock outcrops.

Chestnut Oak Forest

A hardwood forest that occurs on well-drained sites in glaciated portions of the Appalachians, and on the coastal plain. This forest is similar to the Allegheny oak forest; it is distinguished by fewer canopy dominants and a less diverse shrublayer and groundlayer flora. Dominant trees are typically chestnut oak and red oak.

Coastal Oak-beech Forest

A hardwood forest with oaks and American beech codominant that occurs in dry well-drained, loamy sand of morainal coves of the Atlantic Coastal Plain. Some occurrences are associated with maritime beech forest.

Coastal Oak-heath Forest

A low diversity, large patch to matrix, hardwood forest that typically occurs on dry, well-drained, sandy soils of glacial outwash plains or moraines of the Atlantic Coastal Plain. The forest is usually codominated by two or more species of scarlet oak, white oak, and black oak.

Coastal Oak-hickory Forest

A hardwood forest with oaks and hickories codominant that occurs in dry, well-drained, loamy sand of knolls, upper slopes, or south-facing slopes of glacial moraines of the Atlantic Coastal Plain.

Coastal Oak-laurel Forest

A large patch low diversity hardwood forest with broadleaf canopy and evergreen subcanopy that typically occurs on dry, well-drained, sandy and gravelly soils of morainal hills of the Atlantic Coastal Plain. The dominant tree is typically scarlet oak. The shrub layer is well-developed typically with a tall, often nearly continuous cover of the evergreen heath, mountain laurel.

Dwarf Pine Ridges

A woodland community dominated by dwarf individuals of pitch pine and black huckleberry, which occurs on flat-topped summits of rocky ridges. The bedrock is a white quartzite conglomerate; soils are very thin, and they are rich in organic matter from litter that has accumulated on the bedrock.

Hemlock-northern Hardwood Forest

A mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. Eastern hemlock is present and is often the most abundant tree in the forest.



Limestone Woodland

A woodland that occurs on shallow soils over limestone bedrock in non-alvar settings, and usually includes numerous rock outcrops. There are usually several codominant trees, although one species may become dominant in any one stand.

Maritime Beech Forest

A hardwood forest with American beech as a dominant that usually occurs on north-facing exposed bluffs and the back portions of rolling dunes in well-drained fine sands. Wind and salt spray cause the trees to be stunted (average height 4 m to 15 m) and multiple-stemmed with contorted branches, especially on the exposed bluffs.

Maritime Pitch Pine Dune Woodland

A maritime woodland that occurs on stabilized parabolic dunes. The substrate is wind and wave deposited sand that is usually excessively well-drained and nutrient poor. The community is subject to high winds, sand-blasting, salt spray, and shifting substrate.

Maritime Post Oak Forest

An oak-dominated forest that borders salt marshes or occurs on exposed bluffs and sand spits within about 200 meters of the seacoast. The trees may be somewhat stunted and flat-topped from pruning by salt spray and wind exposure. The forest is usually dominated by two or more species of oaks, including post oak, black oak, scarlet oak, and white oak.

Mine/artificial Cave Community

The biota of an abandoned mine or artificial underground excavation. Abandoned mines that are deep enough to maintain stable winter temperatures are important bat hibernacula. Mines, like natural caves, may be terrestrial or aquatic. Wells are also included here.

Oak-tulip Tree Forest

A hardwood forest that occurs on moist, well-drained sites in southeastern New York. The dominant trees include a mixture of five or more of the following: red oak, tulip tree, American beech, black birch, red maple, scarlet oak, black oak, and white oak.

Pine-northern Hardwood Forest

A mixed forest that occurs on gravelly outwash plains, delta sands, eskers, and dry lake sands in the Adirondacks. The dominant trees are white pine and red pine.

Pitch Pine-heath Barrens

A shrub-savanna community that occurs on well-drained, sandy or rocky soils. The most abundant tree is pitch pine and the shrublayer is dominated by heath shrubs.

Pitch Pine-oak Forest

A mixed forest that typically occurs on well-drained, sandy soils of glacial outwash plains or moraines; it also occurs on thin, rocky soils of ridgetops. The dominant trees are pitch pine mixed with one or more of the following oaks: scarlet oak, white oak, red oak, or black oak.

Pitch Pine-oak-heath Rocky Summit

A community that occurs on warm, dry, rocky ridgetops and summits where the bedrock is non-calcareous (such as quartzite, sandstone, or schist), and the soils are more or less acidic. This community is broadly defined and includes examples that may lack pines and are dominated by scrub oak and/or heath shrubs apparently related to fire regime.

Pitch Pine-oak-heath Woodland

A pine barrens community that occurs on well-drained, infertile, sandy soils. The structure of this community is intermediate between a shrub-savanna and a woodland. Pitch pine and white oak are the most abundant trees.



Pitch Pine-scrub Oak Barrens

A shrub-savanna community that occurs on well-drained, sandy soils that have developed on sand dunes, glacial till, and outwash plains.

Rich Mesophytic Forest

A hardwood or mixed forest that resembles the mixed mesophytic forests of the Allegheny Plateau south of New York but is less diverse. It occurs on rich, fine-textured, well-drained soils that are favorable for the dominance of a wide variety of tree species. A canopy with a relatively large number of codominant trees characterizes this forest. Canopy codominants include five or more of the following species: red oak, red maple, white ash, American beech, sugar maple, black cherry, cucumber tree, and black birch.

Rocky Summit Grassland

A grassland community that occurs on rocky summits and exposed rocky slopes of hills. Woody plants are sparse and may be scattered near the margin of the community. Small trees and shrubs may be present at low percent cover.

Shale Talus Slope Woodland

An open to closed canopy woodland that occurs on talus slopes composed of shale. These slopes are rather unstable, and they are usually very well-drained, so the soils are shallow and dry. The canopy cover is usually less than 50%, due to the instability of the substrate.

Spruce-northern Hardwood Forest

A mixed forest that occurs on lower mountain slopes and upper margins of flats on glacial till. This is a broadly defined community with several variants; it is one of the most common forest types in the Adirondacks. Codominant trees are red spruce, sugar maple, American beech, yellow birch, and red maple, with scattered balsam fir.

Terrestrial Cave Community

The terrestrial community of a cave with bedrock walls, including the biota of both solution caves (in limestone) and tectonic caves. Temperatures are stable in deep caves. Small or shallow caves may have a temperature gradient ranging from cold (below freezing) to cool (up to 50 degrees F). Although many caves have ice on the cave floor in winter, the ceiling is warm enough for a bat hibernaculum.

Other Probable Associated Communities

Red cedar rocky summit

Associated Species

Big Brown Bat (*Eptesicus fuscus*)

Eastern Small-Footed Myotis (*Myotis leibii*)

Little Brown Bat (*Myotis lucifugus*)

Indiana Bat (*Myotis sodalis*)

Eastern Pipistrelle (*Perimyotis subflavus*)

Identification Comments

The northern myotis is a medium-sized brown bat with ears that when flattened extend at least 3 mm beyond the tip of its nose. It has a long pointed tragus. It weighs 6-9 g (0.2-0.3 oz) and has a wingspan of 23-26 cm (9-10 in). Its pelage is medium to dark brown on the back and gray to tawny brown underneath.

Identifying Characteristics

Northern myotis can be distinguished from other *Myotis* species by their longer ears, longer pointed tragus, larger wing area, and longer tail. They may also be distinguished acoustically, by analyzing echolocations recorded with a bat detector. Occasionally spectrograms, or visual representations of sound frequencies, of their echolocations could

appear similar to some other *Myotis* species especially small-footed (*M. leibii*) and Indiana bats (*M. sodalis*) in the northeast.

Best Life Stage for Identifying This Species

Adults may be easiest to identify.

Behavior

Northern myotis are nocturnal with periods of heightened activity at pre-dawn and dusk. They maintain large home ranges (although perhaps smaller than some other bat species) to meet their daily energy and resting needs. On study in West Virginia found mean home ranges among females to be 65 ha (range 18-98 ha) (Owen et al. 2003). Northern myotis may roost in small colonies or individually and they switch roosts often (Sasse and Pekins 1996; Carter and Feldhamer 2005).

Northern myotis are short-distance migrants. They have been documented traveling up to 168 miles from hibernacula to summer colonies (Griffin 1945). They have also been documented to move between hibernacula during the winter (U.S. Fish and Wildlife Service 2013).

Genetic research has indicated that there may be male-biased dispersal and site fidelity in females for this species as is common in mammals (Arnold 2007). This means that females often return to the same areas to raise pups and males travel farther than females to find mates. There also appear to be unbalanced sex ratios in favor of males in some regions (NatureServe 2013).

The northern myotis, like most bats, breeds in the fall; they swarm and mate near the cave entrance. Females store sperm over the winter until ovulation occurs in the spring which coincides with emergence from winter hibernacula. Females give birth to one young approximately 50-60 days later (Baker 1983).

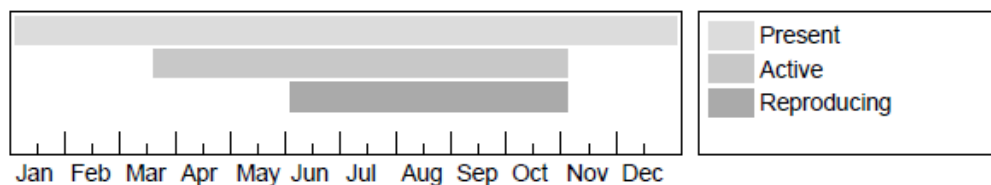
Northern myotis obtain insect prey by capturing them out of the air (aerial hawking) and by gleaning them from vegetation. Locating insects by passive detection and gleaning may allow the northern myotis to obtain a wider variety of insect prey than is typically available to echolocating bats (Faure et al. 1993; Caceres and Barclay 2000). Northern myotis typically forage in forests under the canopy but above the understory, or in small openings, or along streams (U.S. Fish and Wildlife Service 2011).

Diet

Northern myotis have a varied diet. They appear to feed primarily on moths, beetles, and flies although other insect orders are consumed as well, and there are regional differences in major prey items. The diet of northern myotis consisted primarily of beetles (Coleoptera 42%) and moths (Lepidoptera 31%) in one study in West Virginia (Carter et al. 2003). Moths (49%) and beetles (38%) were also the primary prey species found in a larger study in the central Appalachians, with lesser amounts of flies (Diptera) and true bugs (Hemiptera) consumed as well (Dodd et al. 2012). In Indiana, northern myotis preyed primarily on flies (38%) but also beetles (25%) and moths (21%) (Whitaker 2004). Dodd et al. (2012) found that overall, 55% of prey was classified as microlepidoptera, indicating the value of tiny often overlooked moths to this species. Data concerning prey selection are not available specifically for New York.

The Best Time to See

Northern myotis are active at dusk during the spring and summer but they are difficult to distinguish from other *Myotis* species in flight.



The time of year you would expect to find Northern Long-eared Bat in New York.

Similar Species

Eastern Pipistrelle (*Perimyotis subflavus*):

Indiana Bat (*Myotis sodalis*):

Little Brown Bat (*Myotis lucifugus*):

Taxonomy

Kingdom Animalia

└─ **Phylum** Craniata

└─ **Class** Mammals (Mammalia)

└─ **Order** Bats (Chiroptera)

└─ **Family** Vespertilionidae (Evening Bats and Vesper Bats)

Additional Common Names

Northern Bat

Northern Myotis

Additional Resources

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NYS CONSERVATION RESOURCE GUIDES- BIRDS

This section contains a chart with detailed information on all 106 species of birds that have been found in the Village of Union Springs Local Waterfront Revitalization Area (WRA). It includes both the common and scientific name; the legal status in NYS; whether they are found in the WRA as a breeding or migratory species; and an identifying photograph. Also included in this section are conservation resource guides from the NY Natural Heritage Program for the six types birds found in the WRA that are listed as either Threatened or Endangered in New York State.

Note: The format and pagination of the conservation guides has been modified to reduce the number of overall pages in this document; however, the content of the guides is exactly as produced by the NY Natural Heritage Program including any spelling or grammatical errors.



Table 1: Ecological Communities in the WRA- Birds








Name		NYS Legal Status		Image
SWANS, GEESE & DUCKS	Wood Duck (<i>Aix sponsa</i>) ¹	Game Species	Breeding	
	Mallard (<i>anas platyrhynchos</i>) ²	Game Species	Breeding	
	Canada Goose (<i>Branta canadensis</i>) ³	Game Species	Breeding	
	Common Merganser (<i>Mergus merganser</i>) ⁴	Game Species	Breeding	
PARTRIDGES, GROUSE & TURKEYS	Ruffed Grouse (<i>Bonasa umbellus</i>) ⁵	Game Species	Breeding	
	Wild Turkey (<i>Meleagris gallopavo</i>) ⁶	Game Species	Breeding	
	Ring-necked Pheasant (<i>Phasianus colchicus</i>) ⁷	Game Species	Breeding	



Table 1: Ecological Communities in the WRA- Birds (Continued)








Name		NYS Legal Status		Image
BITTERNS, HERONS & ALLIES	Great Blue Heron (<i>Ardea herodias</i>) ⁸	Protected	Breeding	
	Green Heron (<i>Butorides virescens</i>) ⁹	Protected	Breeding	
	Least Bittern (<i>Ixobrychus exilis</i>) ¹⁰	Threatened	Migratory	
VULTURES	Turkey Vulture (<i>Cathartes aura</i>) ¹¹	Protected	Breeding	
KITES, EAGLES, HAWKS & ALLIES	Cooper's Hawk (<i>Accipiter cooperii</i>) ¹²	Protected- Special Concern	Breeding	
	Red-tailed Hawk (<i>Buteo jamaicensis</i>) ¹³	Protected	Breeding	
	Northern Harrier (<i>Circus cyaneus</i>) ¹⁴	Threatened	Breeding	



Table 1: Ecological Communities in the WRA- Birds (Continued)

Name		NYS Legal Status		Image
KITES, EAGLES, HAWKS & ALLIES	Bald Eagle (<i>Haliaeetus leucocephalus</i>) ¹⁵	Threatened	Migratory	
	Peregrine Falcon (<i>Falco peregrinus</i>) ¹⁶	Protected	Migratory	
CARACARAS & FALCONS	American Kestrel (<i>Falco sparverius</i>) ¹⁷	Protected	Breeding	
	Killdeer (<i>Charadrius vociferus</i>) ¹⁸	Protected	Breeding	
SANDPIPERS, PHALAROPES & ALLIES	Spotted Sandpiper (<i>Actitis macularius</i>) ¹⁹	Protected	Breeding	
	Upland Sandpiper (<i>Bartramia longicauda</i>) ²⁰	Protected	Migratory	
	American Woodcock (<i>Scolopax minor</i>) ²¹	Game Species	Breeding	



Table 1: Ecological Communities in the WRA- Birds (Continued)








Name		NYS Legal Status		Image
PIGEONS & DOVES	Rock Pigeon (<i>Columba livia</i>) ²²	Unprotected	Breeding	
	Mourning Dove (<i>Zenaida macroura</i>) ²³	Protected	Breeding	
CUCKOOS, ROADRUNNERS & ALLIES	Black-billed Cuckoo (<i>Coccyzus erythrophthalmus</i>) ²⁴	Protected	Migratory	
TYPICAL OWLS	Short-eared Owl (<i>Asio flammeus</i>) ²⁵	Endangered	Migratory	
	Great Horned Owl (<i>Bubo virginianus</i>) ²⁶	Protected	Breeding	
	Eastern Screech-Owl (<i>Megascops asio</i>) ²⁷	Protected	Breeding	
SWIFTS	Chimney Swift (<i>Chaetura pelagica</i>) ²⁸	Protected	Breeding	

Table 1: Ecological Communities in the WRA- Birds (Continued)








	Name	NYS Legal Status		Image
HUMMINGBIRDS	Ruby-throated Hummingbird (<i>Archilochus colubris</i>) ²⁹	Protected	Breeding	
KINGFISHERS	Belted Kingfisher (<i>Megaceryle alcyon</i>) ³⁰	Protected	Breeding	
WOODPECKERS & ALLIES	Northern Flicker (<i>Colaptes auratus</i>) ³¹	Protected	Breeding	
	Red-bellied Woodpecker (<i>Melanerpes carolinus</i>) ³²	Protected	Breeding	
	Red-headed Woodpecker (<i>Melanerpes erythrocephalus</i>) ³³	Protected-Special Concern	Migratory	
	Pileated Woodpecker (<i>Dryocopus pileatus</i>) ³⁴	Protected	Breeding	
	Downy Woodpecker (<i>Picoides pubescens</i>) ³⁵	Protected	Breeding	



Table 1: Ecological Communities in the WRA- Birds *(Continued)*








Name		NYS Legal Status		Image
WOODPECKERS & ALLIES	Hairy Woodpecker (<i>Picoides villosus</i>) ³⁶	Protected	Breeding	
	Yellow-bellied Sapsucker (<i>Sphyrapicus varius</i>) ³⁷	Protected	Breeding	
TYRANT FLYCATCHERS	Olive-sided Flycatcher (<i>Contopus cooperi</i>) ³⁸	Protected	Migratory	
	Eastern Wood-Pewee (<i>Contopus virens</i>) ³⁹	Protected	Breeding	
	Alder Flycatcher (<i>Empidonax alnorum</i>) ⁴⁰	Protected	Breeding	
	Least Flycatcher (<i>Empidonax minimus</i>) ⁴¹	Protected	Breeding	
	Willow Flycatcher (<i>Empidonax traillii</i>) ⁴²	Protected	Breeding	



Table 1: Ecological Communities in the WRA- Birds (Continued)








	Name	NYS Legal Status		Image
TYRANT FLYCATCHERS	Great Crested Flycatcher (<i>Myiarchus crinitus</i>) ⁴³	Protected	Breeding	
	Eastern Phoebe (<i>Sayornis phoebe</i>) ⁴⁴	Protected	Breeding	
	Eastern Kingbird (<i>Tyrannus tyrannus</i>) ⁴⁵	Protected	Breeding	
VIREOS	Warbling Vireo (<i>Vireo gilvus</i>) ⁴⁶	Protected	Breeding	
	Red-eyed Vireo (<i>Vireo olivaceus</i>) ⁴⁷	Protected	Breeding	
JAYS, MAGPIES & CROWS	American Crow (<i>Corvus brachyrhynchos</i>) ⁴⁸	Protected	Breeding	
	Blue Jay (<i>Cyanocitta cristata</i>) ⁴⁹	Game Species	Breeding	



Table 1: Ecological Communities in the WRA- Birds (Continued)







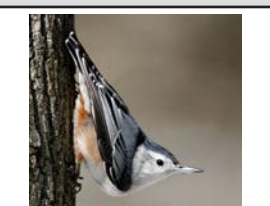
Name		NYS Legal Status		Image
SWALLOWS	Purple Martin (<i>Progne subis</i>) ⁵⁰	Protected	Breeding	
	Barn Swallow (<i>Hirundo rustica</i>) ⁵¹	Protected	Breeding	
	Northern Rough-winged Swallow (<i>Stelgidopteryx serripennis</i>) ⁵²	Protected	Breeding	
	Tree Swallow (<i>Tachycineta bicolor</i>) ⁵³	Protected	Breeding	
CHICKADEES & TITMICE	Tufted Titmouse (<i>Baeolophus bicolor</i>) ⁵⁴	Protected	Breeding	
	Black-capped Chickadee (<i>Poecile atricapillus</i>) ⁵⁵	Protected	Breeding	
NUTHATCHES	White-breasted Nuthatch (<i>Sitta carolinensis</i>) ⁵⁶	Protected	Breeding	

Table 1: Ecological Communities in the WRA- Birds *(Continued)*








Name		NYS Legal Status		Image
CREEPERS	Brown Creeper (<i>Certhia americana</i>) ⁵⁷	Protected	Breeding	
WRENS	Marsh Wren (<i>Cistothorus palustris</i>) ⁵⁸	Protected	Breeding	
	House Wren (<i>Troglodytes aedon</i>) ⁵⁹	Protected	Breeding	
	Winter Wren (<i>Troglodytes troglodytes</i>) ⁶⁰	Protected	Breeding	
OLD WORLD WARBLERS & GNATCATCHERS	Blue-gray Gnatcatcher (<i>Poliophtila caerulea</i>) ⁶¹	Protected	Breeding	
THRUSHES	Veery (<i>Catharus fuscescens</i>) ⁶²	Protected	Breeding	
	Wood Thrush (<i>Hylocichla mustelina</i>) ⁶³	Protected	Migratory	



Table 1: Ecological Communities in the WRA- Birds (Continued)

	Name	NYS Legal Status		Image
THRUSHES	Eastern Bluebird (<i>Sialia sialis</i>) ⁶⁴	Protected	Breeding	
	American Robin (<i>Turdus migratorius</i>) ⁶⁵	Protected	Breeding	
MOCKINGBIRDS, THRASHERS & ALLIES	Gray Catbird (<i>Dumetella carolinensis</i>) ⁶⁶	Protected	Breeding	
	Northern Mockingbird (<i>Mimus polyglottos</i>) ⁶⁷	Protected	Breeding	
	Brown Thrasher (<i>Toxostoma rufum</i>) ⁶⁸	Protected	Breeding	
STARLINGS & ALLIES	European Starling (<i>Sturnus vulgaris</i>) ⁶⁹	Unprotected	Breeding	
WAXWINGS	Cedar Waxwing (<i>Bombicilla cedrorum</i>) ⁷⁰	Protected	Breeding	



Table 1: Ecological Communities in the WRA- Birds (Continued)







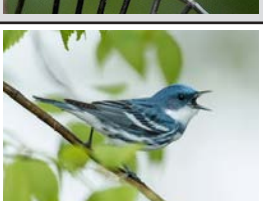
Name		NYS Legal Status		Image
WOOD WARBLERS	Canada Warbler (<i>Cardellina Canadensis</i>) ⁷¹	Protected	Migratory	
	Prairie Warbler (<i>Dendroica discolor</i>) ⁷²	Protected	Migratory	
	Yellow Warbler (<i>Dendroica petechia</i>) ⁷³	Protected	Breeding	
	Common Yellowthroat (<i>Geothlypis trichas</i>) ⁷⁴	Protected	Breeding	
	Ovenbird (<i>Seiurus aurocapilla</i>) ⁷⁵	Protected	Breeding	
	Louisiana Waterthrush (<i>Seiurus motacilla</i>) ⁷⁶	Protected	Breeding	
	Cerulean Warbler (<i>Setophaga creulea</i>) ⁷⁷	Protected- Special Concern	Migratory	



Table 1: Ecological Communities in the WRA- Birds (Continued)







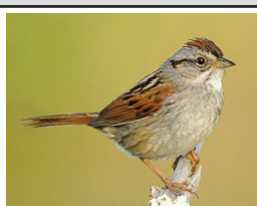
	Name	NYS Legal Status		Image
WOOD WARBLERS	American Redstart (<i>Setophaga ruticilla</i>) ⁷⁸	Protected	Breeding	
	Golden-winged Warbler (<i>Vermivora chrysoptera</i>) ⁷⁹	Protected- Special Concern	Migratory	
	Blue-winged Warbler (<i>Vermivora pinus</i>) ⁸⁰	Protected	Migratory	
TANAGERS	Scarlet Tanager (<i>Piranga olivacea</i>) ⁸¹	Protected	Breeding	
TOWHEES, BUNTINGS, SPARROWS & ALLIES	Grasshopper Sparrow (<i>Ammodramus savannarum</i>) ⁸²	Protected	Breeding	
	Dark-eyed Junco (<i>Junco hyemalis</i>) ⁸³	Protected	Breeding	
	Swamp Sparrow (<i>Melospiza georgiana</i>) ⁸⁴	Protected	Breeding	



Table 1: Ecological Communities in the WRA- Birds (Continued)








Name		NYS Legal Status		Image
TOWHEES, SPARROWS & ALLIES	Song Sparrow (<i>Melospiza melodia</i>) ⁸⁵	Protected	Breeding	
	Savannah Sparrow (<i>Passerculus sandwichensis</i>) ⁸⁶	Protected	Breeding	
	Eastern Towhee (<i>Pipilo erythrophthalmus</i>) ⁸⁷	Protected	Breeding	
	Vesper Sparrow (<i>Pooecetes gramineus</i>) ⁸⁸	Protected- Special Concern	Breeding	
	Clay-colored Sparrow (<i>Spizella pallida</i>) ⁸⁹	Protected	Breeding	
	Chipping Sparrow (<i>Spizella passerina</i>) ⁹⁰	Protected	Breeding	
	Field Sparrow (<i>Spizella pusilla</i>) ⁹¹	Protected	Breeding	



Table 1: Ecological Communities in the WRA- Birds (Continued)








Name		NYS Legal Status		Image
TOWHEES, SPARROWS & ALLIES	White-throated Sparrow (<i>Zonotrichia albicollis</i>) ⁹²	Protected	Breeding	
GROSBEAKS & BUNTINGS	Northern Cardinal (<i>Cardinalis cardinalis</i>) ⁹³	Protected	Breeding	
	Indigo Bunting (<i>Passerina cyanea</i>) ⁹⁴	Protected	Breeding	
BLACKBIRDS	Red-winged Blackbird (<i>Agelaius phoeniceus</i>) ⁹⁵	Protected	Breeding	
	Bobolink (<i>Dolichonyx oryzivorus</i>) ⁹⁶	Protected	Breeding	
	Baltimore Oriole (<i>Icterus galbula</i>) ⁹⁷	Protected	Breeding	
	Brown-headed Cowbird (<i>Molothrus ater</i>) ⁹⁸	Protected	Breeding	



Table 1: Ecological Communities in the WRA- Birds (Continued)









	Name	NYS Legal Status		Image
BLACKBIRDS	Common Grackle (<i>Quiscalus quiscula</i>) ⁹⁹	Protected	Breeding	
	Eastern Meadowlark (<i>Sturnella magna</i>) ¹⁰⁰	Protected	Breeding	
FINCHES	American Goldfinch (<i>Carduelis tristis</i>) ¹⁰¹	Protected	Breeding	
	House Finch (<i>Carpodacus mexicanus</i>) ¹⁰²	Protected	Breeding	
	Purple Finch (<i>Carpodacus purpureus</i>) ¹⁰³	Protected	Breeding	
OLD WORLD SPARROWS	House Sparrow (<i>Passer domesticus</i>) ¹⁰⁴	Unprotected	Breeding	
TURNES, GULLS & ALLIES	Black Tern (<i>Chlidonias niger</i>) ¹⁰⁵	Endangered	Migratory	



Table 1: Ecological Communities in the WRA- Birds (Continued)

Name		NYS Legal Status		Image
GREBES	Pied-billed Grebe (<i>Podilymbus podiceps</i>) ¹⁰⁶	Threatened	Migratory	

Data source: NYS Breeding Bird Atlas (<http://www.dec.ny.gov/cfm/xtapps/bba/legalStatus.cfm>) & U.S. Fish & Wildlife Service IPaC Trust Report prepared for the Union Springs-Springport LWRP on August 1, 2016.

NYS Breeding Bird Atlas

2000-2005

New York State Legal Status Definitions

Endangered Species	Endangered Species are determined by the New York State Department of Environmental Conservation (DEC) to be in imminent danger of extinction or extirpation in New York State, or are federally listed as endangered. All such species are fully protected under New York State ECL 11-0535.
Threatened Species	Threatened Species are determined by the DEC as likely to become endangered within the foreseeable future in New York State, or are federally listed as threatened. All such species are fully protected under the New York State ECL 11-0535.
Special Concern Species	Special Concern Species are those native species which are not yet recognized as endangered or threatened, but for which documented evidence exists relating to their continued welfare in New York State. The Special Concern category exists within DEC rules and regulations, but such designation does not in itself provide any additional protection. However, Special Concern species may be protected under other laws.
Game Species	Game Species are defined as "big game", "small game" or "game bird" species in ECL 11-0103. For some species, there are seasons set when they may be legally hunted. For other species, there are no seasons set and the species may not be hunted or taken at any time in New York.
Protected Species	Protected Species are defined in ECL 11-0103 as all wild birds except those named as unprotected. Some of these birds, such as waterfowl and gallinaceous birds, are also listed as game species with seasons set, while others may not be taken at any time.
Unprotected Species	Unprotected species are those that may be taken at any time without limit. However, a license to take may be required.

<http://www.dec.ny.gov/cfm/xtapps/bba/legalStatus.cfm>



Bald Eagle



Bald Eagle



Photo credits: U.S. Fish and Wildlife Service

Scientific Name *Haliaeetus leucocephalus*
(Linnaeus, 1766)

Family Name Accipitridae
Hawks and Eagles

Did you know?

The word "bald" in bald eagle is shortened from the word "piebald" which means spotted or patched, especially in black and white. Piebald is a fitting description for the bald eagle because of its dark body and white head and tail (Cornell Lab of Ornithology 2003).

Summary

Protection Threatened in New York State, protected federally.

This level of state protection means: A native species likely to become an endangered species within the foreseeable future in New York (includes any species listed as federally Threatened by the United States). It is illegal to take, import, transport, possess, or sell an animal listed as Threatened, or its parts, without a permit from NYSDEC. 1) Any native species likely to become an endangered species within the foreseeable future in New York. 2) Any species listed as threatened by the U.S. Department of the Interior.

This species is protected under the Migratory Bird Treaty Act. The Migratory Bird Treaty Act implements various treaties and conventions between the U. S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under this Act, taking, killing, or possessing migratory birds, including nests or eggs, is unlawful unless specifically permitted by other regulations.

Conservation and Management

Threats

While Bald Eagle breeding and non-breeding populations are increasing in New York, there are still significant threats to the persistence of this species in the state. Habitat loss or alterations are probably the most significant threats. Many parts of New York are under high development pressure. This species prefers relatively undisturbed, wooded areas near wetlands or large bodies of water with abundant prey (fish). Areas with development or other human disturbances would likely be unsuitable for nesting and wintering Bald Eagles. Habitat destruction has been more extensive in the Bald Eagle wintering range (Nye 1994). Disturbance to wintering birds can be especially detrimental because it may deplete the birds' energy reserves. Bald Eagles spend most of the winter sedentary (approximately 99%); energy is reserved for foraging, feeding, thermoregulation, and other essential activities (Nye 1994). Depleted energy may result in a drop in an individual's reproductive rate for the year, or death (Nye 1994). In addition, if a feeding bald eagle is disturbed it may abandon its food and most likely will not return to the area for the rest of the day. Banning DDT has greatly increased the reproductive health of bald eagles, but there are many other contaminants that continue to affect the reproductive success of adult pairs such as lead, mercury, and PCBs. Other threats include vehicular collisions (such as high speed trains), and collisions with towers, wind generators, and electrical lines (McGowan and Corwin 2008 and Nye 2005).

Conservation Strategies and Management Practices

Human disturbances should be minimized at breeding and wintering sites. Pedestrians can be more disturbing to Bald Eagles than some motorized vehicles (Nye 1994). A 500 meter buffer around the nest may be adequate (NatureServe 2005). A minimum buffer of 250-300 meters is recommended for perch and feeding sites; others have recommended a greater distance (Nye 1994). It may be beneficial to post signs and restrict access to areas when breeding or wintering Bald Eagles are present. Vegetative buffer zones may help minimize some disturbances associated with development (Nye 1994). Avoid the addition of new, tall structures such as wind-generators, towers, and electrical lines near breeding and wintering locations.

Research Needs

Determine the essential Bald Eagle breeding and wintering habitats through field observations and radio telemetry. Collect more data about site fidelity, familial relationships to habitat use, migratory patterns/pathways, and home ranges of breeding and wintering Bald Eagles in New York. Sample for contaminant loads periodically (Nye 2005).

Habitat

Bald Eagles are typically found near large bodies of water, such as bays, rivers, and lakes, that support a healthy population of fish and waterfowl, their primary food source. Generally, Bald Eagles tend to avoid areas with human activities. They will perch in either deciduous or coniferous trees. Large, heavy nests are usually built near water in tall pine, spruce, fir, cottonwood, oak, poplar, or beech trees. Non-breeding adults and wintering birds are known to have communal roost sites. During the winter, the roost sites may be farther away from food sources. This may be due to the need for a more sheltered, warmer area. Feeding areas during the winter months usually have a high concentration of fish and waterfowl and open water (NatureServe 2005).

Associated Ecological Communities

Acidic Talus Slope Woodland

An open to closed canopy woodland that occurs on talus slopes (slopes of boulders and rocks, often at the base of cliffs) composed of non-calcareous rocks such as granite, quartzite, or schist.

Allegheny Oak Forest

A hardwood forest that occurs on well-drained sites in the unglaciated portion of southwestern New York. This is a forest of mixed oaks with a diverse canopy and richer ground flora than other oak communities in the state.



Appalachian Oak-hickory Forest

A hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants. The dominant trees include red oak, white oak, and/or black oak. Mixed with the oaks, usually at lower densities, are pignut, shagbark, and/or sweet pignut hickory.

Black Spruce-tamarack Bog

A conifer forest that occurs on acidic peatlands in cool, poorly drained depressions. The characteristic trees are black spruce and tamarack; in any one stand, either tree may be dominant, or they may be codominant. Canopy cover is quite variable, ranging from open canopy woodlands with as little as 20% cover of evenly spaced canopy trees to closed canopy forests with 80 to 90% cover.

Calcareous Talus Slope Woodland

An open or closed canopy community that occurs on talus slopes composed of calcareous bedrock such as limestone or dolomite. The soils are usually moist and loamy; there may be numerous rock outcrops.

Chestnut Oak Forest

A hardwood forest that occurs on well-drained sites in glaciated portions of the Appalachians, and on the coastal plain. This forest is similar to the Allegheny oak forest; it is distinguished by fewer canopy dominants and a less diverse shrublayer and groundlayer flora. Dominant trees are typically chestnut oak and red oak.

Floodplain Forest

A hardwood forest that occurs on mineral soils on low terraces of river floodplains and river deltas. These sites are characterized by their flood regime; low areas are annually flooded in spring, and high areas are flooded irregularly.

Hemlock-northern Hardwood Forest

A mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. Eastern hemlock is present and is often the most abundant tree in the forest.

Oak-tulip Tree Forest

A hardwood forest that occurs on moist, well-drained sites in southeastern New York. The dominant trees include a mixture of five or more of the following: red oak, tulip tree, American beech, black birch, red maple, scarlet oak, black oak, and white oak.

Red Maple-hardwood Swamp

A hardwood swamp that occurs in poorly drained depressions, usually on inorganic soils. Red maple is usually the most abundant canopy tree, but it can also be codominant with white, green, or black ash; white or slippery elm; yellow birch; and swamp white oak.

Red Maple-tamarack Peat Swamp

A swamp that occurs on organic soils (peat or muck) in poorly drained depressions. These swamps are often spring fed or enriched by seepage of mineral-rich groundwater resulting in a stable water table and continually saturated soil. The dominant trees are red maple and tamarack. These species usually form an open canopy (50 to 70% cover) with numerous small openings dominated by shrubs or sedges.

Rich Mesophytic Forest

A hardwood or mixed forest that resembles the mixed mesophytic forests of the Allegheny Plateau south of New York but is less diverse. It occurs on rich, fine-textured, well-drained soils that are favorable for the dominance of a wide variety of tree species. A canopy with a relatively large number of codominant trees characterizes this forest. Canopy codominants include five or more of the following species: red oak, red maple, white ash, American beech, sugar maple, black cherry, cucumber tree, and black birch.



Spruce-fir Swamp

A conifer swamp that typically occurs in a drainage basin but also can occur at the edge of a lake or pond or along gentle slopes of islands. These swamps are usually dense, with a fairly closed canopy (80 to 90% cover). The dominant tree is usually red spruce. Codominant trees include balsam fir and red maple. In the Catskills, balsam fir may be absent, and in the Adirondacks, black spruce or white spruce may replace red spruce as a dominant tree.

Spruce-northern Hardwood Forest

A mixed forest that occurs on lower mountain slopes and upper margins of flats on glacial till. This is a broadly defined community with several variants; it is one of the most common forest types in the Adirondacks. Codominant trees are red spruce, sugar maple, American beech, yellow birch, and red maple, with scattered balsam fir.

Other Probable Associated Communities

Beech-maple mesic forest
Maple-basswood rich mesic forest
Pine-northern hardwood forest
Pitch pine-oak-heath rocky summit
Shale talus slope woodland

Identification Comments

Identifying Characteristics

Adult bald eagles can easily be identified by their white head, white tail, and large, bright yellow bill. The plumage is otherwise dark. Immature bald eagles are dark with variable amounts of light splotching on the body, underwing coverts, flight feathers, and tail base. They have a grey bill. Adult plumage and a yellow bill are attained at four to five years of age. The average size of an adult is 79-94 cm (31-37 inches) long with a wingspan of 178-229 cm (70-90 inches) (National Geographic Society 1987). Bald eagle nests are built near the top of sturdy, tall trees. The nest is a flat-topped mass of sticks that is lined with fine vegetation such as rushes, grasses, and mosses. Each year, the breeding pair adds to the nest resulting in a massive nest that can be seven to eight feet across and weigh up to several tons. Eggs are slightly smaller than a domestic goose egg and are dull white. Their call has been described as a harsh cackle, kleeek-kik-ik-ik-ik or a lower kak-kak-kak.

Behavior

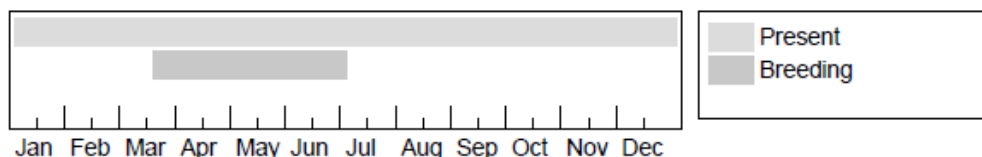
At approximately 5 years of age, Bald Eagles reach sexual maturity. They typically mate for life, but exceptions are noted. Courtship displays can be observed late winter to early spring and involve elaborate aerial displays; the pair will dive with locked talons. Males and females build nests together and continue to add sticks each breeding season. In addition, the pair incubates and cares for young together. However, the female takes on most of this responsibility. After the breeding season, Bald Eagles are often found at communal roosts and feeding areas.

Diet

The Bald Eagle's primary food sources are fishes, injured waterfowl and seabirds, various mammals, and carrion. They are opportunistic feeders; they will hunt live prey, scavenge, and pirate food from other birds.

The Best Time to See

Concentrations of Bald Eagles can be found in New York during the winter months. In southeastern New York, Bald Eagles begin arriving on the wintering area in early November and are most abundant in February. During late February to early March, Bald Eagles are moving to their breeding territories.



The time of year you would expect to find Bald Eagle in New York.

Similar Species

Osprey (*Pandion haliaetus*): Ospreys have a white head like the Bald Eagle, but unlike the Bald Eagle, they have a prominent dark eye stripe. Ospreys are white below and dark brown above. When in flight, ospreys' long, narrow wings are bent back at the wrist.

Golden Eagle (*Aquila chrysaetos*): Immature Bald Eagles differ from immature Golden Eagles in that the Golden Eagle has feathered legs and white is limited to the flight feathers. Also, Golden Eagles soar with the outer part of the wings lifted in a slight dihedral.

Taxonomy

Kingdom Animalia
 └─ **Phylum** Craniata
 └─ **Class** Birds (Aves)
 └─ **Order** Raptors (Ralconiformes)
 └─ **Family** Accipitridae (Hawks and Eagles)

Additional Resources

Links

NatureServe Explorer

<http://natureserve.org/explorer/servlet/NatureServe?searchName=HALIAEETUS+LEUCOC EPHALUS>

Google Images

<http://images.google.com/images?q=HALIAEETUS+LEUCOCEPHALUS>

New York State Department of Environmental Conservation

<http://www.dec.ny.gov/animals/7068.html>

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Black Tern



Black Tern in breeding plumage



Scientific Name *Chlidonias niger*
(Linnaeus, 1758)

Family Name Laridae
Terns, Gulls and Relatives

Did you know?

This species is most appropriately considered a tropical marine bird since it spends nearly two-thirds of the year on salt water in the southern hemisphere, coming north only to breed on freshwater marshes for a brief period in the summer (Nisbet 1997).

Summary

Protection Endangered in New York State, protected federally.

This level of state protection means: A native species in imminent danger of extirpation or extinction in New York (includes any species listed as federally Endangered by the United States). It is illegal to take, import, transport, possess, or sell an animal listed as Endangered, or its parts, without a permit from NYSDEC. 1) Any native species in imminent danger of extirpation or extinction in New York. 2) Any species listed as endangered by the United States Department of the Interior.

Rarity G4, S2B

A global rarity rank of G4 means: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery. A state rarity rank of S2B means: Typically 6 to 20 breeding occurrences or very limited breeding acreage in New York State.

Conservation Status in New York

Black Terns were listed as an endangered species in New York State in 2000 and have been declining since the mid-1960s. Prior to 1980, the tern population was comprised of over 50 different colonies with four containing more than 100 pairs each. By 2007 only 12 different marshes supported colonies, with the largest having fewer than 50 pairs (McGowan and Corwin In Press). The range contraction within New York parallels a wider regional contraction on the species' range margin in the northeastern U.S. and Canada. The causes of this decline are unresolved and ongoing.

Short-term Trends

Since 1989 the state-wide population has been monitored semi-annually (Mazzocchi and Roggie 2004) and has declined at an annual rate of 2.2%. At the beginning of the monitoring program, Black Terns bred in 28 different marshes (44% of those monitored), while in 2007 only 12 different marshes supported breeding colonies (13% of those monitored) and only about half of those were of substantial size. Breeding colonies appear to be coalescing into fewer large wetland complexes on publicly managed lands, with the smaller outlying sites becoming extirpated. In particular, the birds have disappeared entirely from the Lake Ontario Plains in Wayne and Monroe counties in western New York State, which supported over 40 pairs as recently as the late 1980s. Nevertheless, the overall number of breeding pairs throughout the state apparently bottomed out around 2000, and by 2007 had climbed to over 200 pairs for the first time since the late 1990s.

Long-term Trends

Black Terns have nested in New York since at least the early 1900s and while turn-of-the century records are few, Eaton (1910) mentioned 150 pairs at what is now Lakeview WMA in 1903, a site that supported only 2 pairs in 2007. Prior to 1980, the statewide tern population was comprised of over 50 different colonies with four containing more than 100 pairs each. By 2007 only 12 different marshes supported colonies, with the largest having less than 50 pairs (McGowan and Corwin In Press). Montezuma NWR also had a large turn of the century colony and this wetland complex has a fairly complete set of population estimates beginning in the early 1940s; it is likely illustrative of population trends throughout the state. Unpublished data (New York State Department of Environmental Conservation Files) gathered by Refuge staff show a marked population increase from the 1940s to about 1951. During the 1950s the breeding population fluctuated wildly from over 1200 pairs in some years to less than 100 pairs in other years. Beginning in the late 1960s the population crashed to below 150 pairs, again fluctuating quite dramatically from year to year until about 1980 when another crash occurred. Since the early 1980s the breeding population has remained low bottoming out during the 1990s when no terns nested at all in Montezuma; by 2007 18 pairs were counted.

This species is protected under the Migratory Bird Treaty Act. The Migratory Bird Treaty Act implements various treaties and conventions between the U. S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under this Act, taking, killing, or possessing migratory birds, including nests or eggs, is unlawful unless specifically permitted by other regulations.

Conservation and Management

Threats

Current State and Federal regulations (i.e., the Migratory Bird Treaty Act) appear to offer adequate protections to the birds themselves, though habitat protections such as the New York State Wetlands Law, and Section 404 of the Clean Water Act are not adequate to prevent all wetland habitat losses (Holst 2005). Loss, degradation, isolation, and fragmentation of wetlands via drainage for agriculture and/or urbanization are often considered to be the primary factors for the decline of this species and other freshwater marshbirds. For example, in Canada nearly half of the wetlands along the St. Lawrence River were destroyed between 1945-75, and a similar pattern occurred on the U.S. side (Novak 1992). This has left many localized marshes that were too small themselves, or were not part of larger wetland complexes, unsuitable because Black Terns are an areadependent species (Brown and Dinsmore 1984). Water level management on Lake Ontario and the St. Lawrence Seaway has undoubtedly negatively affected lakeshore marsh habitat by allowing succession to proceed, leading to the dominance of wetlands by single species monocultures such as *Typha* and/or *Phragmites*. Since the mid-1980s, virtually all of the Black Tern colonies in lakeshore marshes in Monroe/Wayne and Oswego/Jefferson/St. Lawrence Counties have either disappeared entirely or dramatically declined so that today virtually all Black Terns nest on inland marshes on public lands which have the ability to manipulate water levels. Lake Ontario/ St. Lawrence Seaway water level stabilization, implemented primarily for shipping interests, has curtailed dramatic annual water level fluctuations on these commercial waterways leading to compositional changes in marsh vegetation, diminishing their quality as tern nesting habitat (McGowan and Corwin In press). Because the Black Tern is sensitive to water level fluctuations it has been adopted as a performance indicator species by the International Joint Commission Lake Ontario - St. Lawrence River Study (www.losl.org). At inland marshes, siltation and run-off from intensive agricultural practices and urbanization leads to the eutrophication and chemical contamination of wetlands, affecting habitat quality and diminishing the invertebrate prey base. One study in the northern Great Plains found that wetland invertebrate and seedling emergence was greatly reduced by agricultural sediment loads, hampering successional changes and severely impacting nearly all key ecological functions of wetlands (Gleason et al. 2003). The highly intensive agricultural practices (i.e., large monocultures needing heavy inputs of synthetic chemicals and use of heavy machinery) adopted especially since the 1980s have



been implicated not only in the severe decline of Black Terns in Europe (Bientema 1997), but also in the general decline of a whole suite of agricultural and wetland birds in the St. Lawrence Valley (Jobin et al. 1996), as well in the entire central and eastern U.S. (Murphy 2003). In certain other cases, lack of stochastic flushing events (i.e., flooding) promotes the establishment of large monotypic stands of emergent vegetation (cattails) as well as exotic invasive plants like purple loosestrife and phragmites which can become too dense and crowd out native emergent plants which provide more favorable nesting cover for nesting Black Terns and other marshbirds (Holst 2005). In addition to diminishing the insect and fish prey base and causing dietary problems for Black Terns (Bientema 1997), chemical contaminants, including organochlorines (PCBs, DDT, DDE, Dieldrin) have been detected in Black Tern eggs in Canada (Weseloh et al. 1996) and the U.S. Severe contaminant concentrations, and very poor reproductive success at a site in Monroe County was reported by Firstencel (1987). The levels of contaminants she found were about two times higher than in Black Tern eggs in Ontario and Quebec (Weseloh et al. 1996), likely causing decreases in eggshell thickness and nest failure. Because contaminant concentrations in sediments were low, Firstencel suggested that the high levels of contaminants were coming from fish (greater bioaccumulation than insects) which the terns feed to their young. Because many banned pesticides are still used in South America where the birds spend most of the year feeding on fish, exposure on the wintering grounds must also be considered to be high. Nevertheless, strong circumstantial evidence suggests that the high levels of contamination reported by Firstencel (1987) in western New York may be at least partially responsible for the complete elimination of Black Terns from this (more industrialized) region of the State. The loss of the pre-migratory staging area at the mouth of the Niagara River, another highly polluted waterway, also lends some support to the deleterious role that chemical contamination has played in the severe decline of the Black Tern in New York. Nisbet (1997) reported that population declines in Europe were more pronounced in more highly degraded habitats than in more natural ones. Various types of human disturbance have often been cited as potential threats to nesting Black Terns. Excessive boat traffic as well as waves caused by boat wakes can swamp nests, but boat traffic did not appear to have overtly visible effects on nesting terns at four different colonies in New York (Novak 1992). Canoes moving through areas where terns are nesting produces mobbing behavior by the adults and may increase the likelihood of nest abandonment, predation or exposure to inclement weather (Novak 1992). Shealer et al. (2000) demonstrated that Black Terns have a high tolerance for intensive disturbance (repeated nest visits for trapping and banding) but that these nests suffered high (47%) mortality rates mostly due to predation. Likewise Heath and Servello (2008) documented the importance of nest predation to chick survival, but were unable to identify the predator species. Many different birds and mammals have been implicated as Black Tern nest predators (Heath and Servello 2008), but extreme caution should be taken when high nest mortality rates are provided by researchers visiting nests because both bird and mammal predators can follow human scent trails looking for prey.

Conservation Strategies and Management Practices

A review of management actions at the Iroquois/Tonawanda/Oak Orchard wetland complex in western New York showed a consistent pattern of response by nesting Black Terns (Hickey and Malecki 1997). After the drawdown of water levels in an impoundment, the terns recolonized the wetland the year following re-flooding, reaching peak numbers in the second and third years after the drawdown. In the first year post-inundation, vegetation responded, the muskrat population grew and Black Tern nesting was likely limited by the lack of suitable nest substrates. In the second and third years, muskrat (*Ondatra zibethicus*) feeding and house-building activities removed vegetation from the marsh, improving the interspersed vegetation to water (50:50 ideal) and providing nesting substrates. Because muskrat structures are heavily used as nesting substrates, especially in marshes dominated by less persistent emergents such as bur-reed, their population dynamics (including the effects of trapping), suggests that muskrat ecology is an important feature to Black Tern nesting success (Hickey and Malecki 1997). Thus, a 4-6 year cycle of drawdown should be used, with re-flooding during years 2-5. Water levels should be maintained higher than normal in the first year following re-flooding in order to allow muskrat populations to recover. Removal of vegetation by muskrat herbivory benefits Black Terns by improving the interspersed vegetation cover and open water and by

increasing the availability of nesting substrates (Zimmerman et al. 2002). Because nest substrates are often limiting, the placing of artificial nest platforms, especially in the first year after drawdown, may enhance productivity (Hickey 1997).

This type of management strategy requires at least three nearby marsh impoundments to be managed on a staggered 3 year management cycle, with one of the impoundments being drained, disced, and re-flooded each year. Such a strategy is time and labor intensive, costly, and necessitates a large wetland mosaic amenable to intensive management with heavy machinery to disc up marsh vegetation (Shambaugh 1996). Since many managed areas will not have the resources and area available to implement such an intensive strategy (which also is beneficial to other marshbirds and waterfowl) other, less costly strategies have been attempted in the northern Great Plains (Linz et al. 1994; Linz and Blixt 1997). Because these management strategies involved the application of potentially dangerous herbicides to reduce cattail growth, the authors themselves recommended that manual methods were preferred, and that herbicides be used only as a last resort (Linz and Blixt 1997). Water level control measures, discing, and healthy muskrat populations could potentially all be used in concert to control dense monotypic stands of vegetation and promote the hemi-marsh stage (a 50:50 ratio of well interspersed vegetation and open water) (Zimmerman et al. 2002).

Black Terns use different wetlands or different locations within a wetland mosaic from year to year because suitability varies with yearly fluctuations of water levels and resulting vegetational changes. The presence of Black Terns is related to the total area of wetlands in the surrounding landscape; thus wetland complexes must be maintained because they are more likely to have at least some wetland components with water and plant regimes favorable for nesting. Areas of suitable habitat >10 ha that have equal proportions of well-interspersed emergent vegetation and open water, with stable water levels (> 30 cm depth) throughout the breeding season (May-June). Maintaining stable water levels during the nesting season decreases the probability of nest destruction and decreases the chances of nest predation (Zimmerman et al. 2002).

Research Needs

Nisbet (1997) summarized important research needs for Black Terns: 1) improve ecological understanding on the wintering grounds; 2) monitoring population trends in the main range in the prairie states and provinces; 3) measure factors limiting productivity; 4) study foraging, diet, and nutrition in relation to habitat quality, water quality, and prey populations; 5) study behavioral ecology, including nocturnal incubation, mate fidelity, spacing behavior, coloniality, dispersal, and post-fledging parental care; 6) study the demography of metapopulation dynamics; and 7) implement comparative studies across regions.

In New York specifically, determining the cause of the decline is paramount so that steps can be taken to mitigate limiting factors. Two hypotheses have generally emerged: 1) productivity problems related to contaminant effects on the birds themselves and/or their prey base, or 2) habitat alterations associated with wetland loss and modifications. Declines of this species in Europe (Bientema 1997) have essentially tied these factors together such that land use changes associated with intensive agriculture and urbanization have led to the eutrophication and contamination of wetlands, which in turn collapses the prey base and lowers productivity below that which can sustain the population. This hypothesis has also been invoked to explain ongoing declines in other agricultural avifauna in both Europe and North America (Murphy 2003).

Habitat

Black Terns breed in productive freshwater marshes, typically in sites with mixtures of emergent vegetation and open water. In western New York Hickey and Malecki (1997) found that Black Terns nest primarily in sparse to moderately dense bur-reed about 26-50 cm tall in areas with a 50:50 open water/vegetation ratio, and water depths of about 50 cm. These findings were consistent with other general habitat descriptions throughout the range including in northern



New York. Muskrat structures were used heavily and may reflect the vegetation type and processes that foster nest substrate formation. In marshes with less persistent emergents such as bur-reed, nest substrate formation may depend heavily on muskrat activities. Where terns nest in cattail dominated marshes, such as in northern New York (Mazzocchi et al. 1997), muskrats may not be as important since floating vegetation mats and rootstalks may form more often in marshes dominated by these more persistent emergents (also bulrushes). Exposed perches such as floating logs, fallen trees, and standing dead trees and shrubs are used as stations for resting, copulation and feeding recently fledged young (Novak 1992).

Black Terns are an area dependent species and in addition to marsh size, proximity to other wetlands is a critical factor in habitat selection. Terns favor marshes > 20 ha, but they will nest in marshes between 5-11 ha only if they are part of a larger wetland complex (Brown and Dinsmore 1984; Novak 1992). Characteristics of entire landscapes must be considered in habitat assessments because wetlands that do not correspond to landscape-scale habitat requirements may not be suitable despite favorable local conditions. Suitable nest sites occur within regenerating or degenerating wetlands where vegetation structure, rather than species of vegetation, dictates suitability (Naugle et al. 2000).

Associated Ecological Communities

Deep Emergent Marsh

A marsh community flooded by waters that are not subject to violent wave action. Water depths can range from 6 in to 6.6 ft (15 cm to 2 m). Water levels may fluctuate seasonally, but the substrate is rarely dry, and there is usually standing water in the fall.

Impounded Marsh

A marsh (with less than 50% cover of trees) in which the water levels have been artificially manipulated or modified, often for the purpose of improving waterfowl habitat.

Shallow Emergent Marsh

A marsh meadow community that occurs on soils that are permanently saturated and seasonally flooded. This marsh is better drained than a deep emergent marsh; water depths may range from 6 in to 3.3 ft (15 cm to 1 m) during flood stages, but the water level usually drops by mid to late summer and the soil is exposed during an average year.

Associated Species

American Bittern (*Botaurus lentiginosus*)

American Coot (*Fulica americana*)

Common Moorhen (*Gallinula chloropus*)

Least Bittern (*Ixobrychus exilis*)

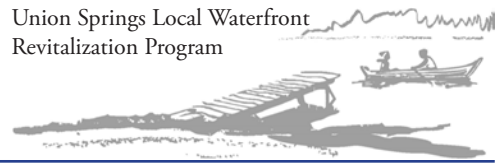
Pied-Billed Grebe (*Podilymbus podiceps*)

Virginia Rail (*Rallus limicola*)

Identification Comments

Identifying Characteristics

The total length of adults is 23-26.5 cm (9-10.5 inches). In breeding plumage the head and body are black, fading to gray on the rump while the undertail coverts are white. The upper surface of the wings and tail are dark gray, and wing linings are pale gray. The bill is black and feet are a dark reddish-purple. Females are somewhat duller than males, but this difference is often difficult to distinguish in the field. The postbreeding molt begins in late June when eggs begin to hatch. White feathers appear first around eyes and cheeks, then on forehead, neck, throat and breast, and finally on the abdomen. Heavily molting adults take on a peculiar, piebald appearance. The prebasic molt is completed during fall migration.



In winter plumage, the underparts are pure white except for a small, dark patch on each side of the breast and the back becomes a shade of gray similar to the wings and tail. A blackish cap joins black ear coverts on the otherwise white head. The juvenile plumage is similar to the winter plumage, but the feathers of the back are darker and the wing coverts and cap are barred and scalloped brown.

VOCALIZATIONS: shrill, somewhat metallic alarm notes, described as “kik” or “keek”, depending upon intensity and level of motivation, and a complex of contact calls described as “kyew”, followed by one to four additional syllables, as “kyew-dik”, “kyew-dik-ik”. The “kik” call commonly serves as a signal of impending danger in the nesting area. It may also be given during the ascent portion of the courtship flight. The “keek” call is similar to, but more shrill and forceful than the “kik” call, and is given during aggressive attacks on enemies in close proximity to the nest. The frequency of repetition increases as the terns become more aggressive. The “kyew” calls are given as parents approach and leave the nest, during foraging flights, by adults accompanied in flight by young, by parents calling to young at or near the nest, by parents at the nest during incubation, brooding and feeding, and during the courtship flights.

EGGS: ovate, ground color varies from dark olive to light buff with markings of dark brown and gray. Markings vary from small dots and scrawls to very large blotches and are often particularly heavy around the larger end of the egg. The average dimensions for 122 eggs in the U.S. National Museum were 34 x 24 mm (Bent 1921).

Nests are typically located in shallow water, close to open water or openings in stands of emergent vegetation. Nests are placed on heaps of floating vegetation, on old muskrat house, old grebe or coot nest, or on floating wood (Novak 1990). Floating mats of muck or algae, mud flats, and mud mounds and islands also have been used. The nest consists of a small gathering of aquatic vegetation with a simple, cup-like bowl (Weller and Spatcher 1965, Bailey 1977).

Characteristics Most Useful for Identification

The overall dark coloration, highly acrobatic flight, and petite size (9-10”, wingspan 2 ft.) distinguish this bird from other gull and tern species.

Best Life Stage for Identifying This Species

Adults in breeding plumage.

Behavior

Black Terns are gregarious throughout the year and are considered a semi-colonial nesting species (Cuthbert 1954, Bergman et al. 1970). Nests may be clumped closely in favorable habitat or more widely scattered in less favorable areas. As is typical of colonial nesting gulls and terns, Black Terns will join together to defend the nesting area from intruders (Cuthbert 1954).

Breeding colonies commonly change their locations if conditions become unfavorable (i.e., slight water level changes). Return rates may vary considerably among specific sites. Stern et al. (1985) found that 67% of recaptured terns nested within the same primary wetlands, while Bailey (1977) and Dunn (1979) reported return rates of 40% and 27% for marshes in Wisconsin and Ontario, respectively. These return rates, which are low in comparison with other gulls and terns, may be the result of the relative instability of their preferred habitat (McNicholl 1975).

Conspicuous aerial courtship displays characterize the courtship period, which begins soon after arrival at the breeding site. In the “high-flight”, a group of 2-20 terns ascend together to a great height then split into smaller groups of two or three and descend in rapid glides (Baggerman et al. 1956). During the “fish-flight”, a male tern carries a small fish or large insect in its bill and is closely followed by a female as the two fly about the marsh. At the close of this aerial display the male follows the female to a perch and feeds her (Baggerman et al. 1956). Similar to some other marsh-nesting birds (i.e., Pied-billed Grebes), brooding Black Terns appear to leave their nest at night, leaving the eggs totally abandoned (Faber and Elbert 1996), or else the males incubate while females and non-breeding males spend the night at communal roosts up to 2-3 km away (Custer and Custer 1996). Eggs in

abandoned nests had high levels of Organochlorine contaminants in them suggesting this may have played a role in this behavior. Black Terns' overall low reproductive rate (< 1 chick fledged/pair), and low nest success rates ($< 50\%$) are often attributed to nest predation, but in some ways may be related to this nocturnal brooding behavior. In order to compensate for such low reproductive rates, Black Terns are relatively long-lived for a bird (~ 8 yr.) and adults have comparatively high annual survival rates (Dunn and Agro 1995).

Diet

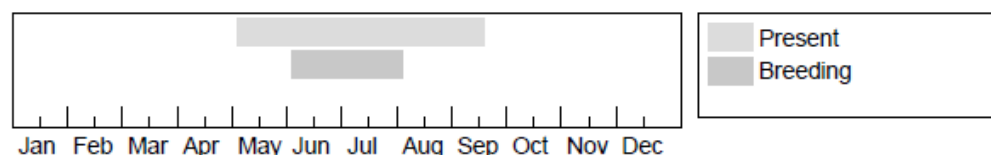
On the breeding grounds Black Terns are primarily insectivorous, although small crustaceans, spiders and small fishes are also regular food items (Bent 1921). The diet may vary depending on habitat and food availability. Fishes may be an especially important food item especially in terms of biomass. Small fish appear to be critical for chick development since chicks cannot develop on insects alone and fish are a key source of calcium. In waters devoid of adequate fish prey calcium deficiency leads to malformation and death in chicks (Bientema 1997). In Maine, Gilbert and Servello (2005) found that chicks could develop normally on insects and/or fish alone, but that the availability and choice of food may affect adults more so than chicks. Because of their higher biomass and nutritional value, adults primarily feeding fish to chicks may have to spend less time and energy feeding the young with positive consequences for their own condition, survival, and future breeding success. The capability to use both fish and insects may reduce potential variability in food availability during the breeding season (Gilbert and Servello 2005).

In wetlands, food is captured in the air, at or just below the water surface, and from the surface of emergent vegetation (Goodwin 1960). In the prairies, much of the food is obtained from plowed land and fields of grain but foraging over agricultural land near marshes has rarely been observed in New York (Novak 1992). In a sample of 376 feedings of young in different nests at North Pond in New York, Goodwin (1960) found that 41% of the items brought by parents were minnows and 59% were insects, including 45% damselflies. Insects comprised 93.6% of 602 feedings to chicks in Michigan while fishes accounted for just 4.9% (Cuthbert 1954). Although many of the insects could not be identified, damselflies, dragonflies, and mayflies were important food items. One study reported that 46 damselflies per hour were fed to chicks (Dunn and Agro 1995).

The Best Time to See

Black terns typically arrive from their South American wintering grounds in early May and begin actively searching for suitable nesting marshes. June is the prime nesting season, but nesting often extends into mid-July. Young of the year are in the air and feeding with adults in late July and August, and the birds begin departing by September. In the northeastern U.S., egg laying begins in late May, but may be initiated as late as the middle of July. Nests with eggs were observed at one site in western New York from 24 May to 12 July (Firstencel 1987). During a 1989 survey of colonies throughout New York, nests with eggs were observed as early as 25 May and as late as 18 July (Novak 1990). Black Terns are not known to be double brooded so later nests probably represent renesting attempts; and they can reneest up to 40 km away (Muller and Roggie 2001).

Spring arrival seems to have advanced by about a month since the turn of the century. Eaton (1910) reported that Black Terns typically arrived around the first of June and nested in July.



The time of year you would expect to find Black Tern in New York.

Similar Species

Common Tern (*Sterna hirundo*): The Common tern is much lighter in overall coloration with a heavier orange (not dark) bill and larger size.



Taxonomy

Kingdom Animalia
└─ **Phylum** Craniata
 └─ **Class** Birds (Aves)
 └─ **Order** Gulls, Plovers, and Shorebirds (Charadriiformes)
 └─ **Family** Laridae (Terns, Gulls and Relatives)

Additional Resources

Links

NatureServe Explorer

<http://natureserve.org/explorer/servlet/NatureServe?searchName=CHLIDONIAS+NIGER>

Google Images

<http://images.google.com/images?q=CHLIDONIAS+NIGER>

The Birds of North America

<http://bna.birds.cornell.edu/bna/species/147/articles/introduction>

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Least Bittern



Least Bittern

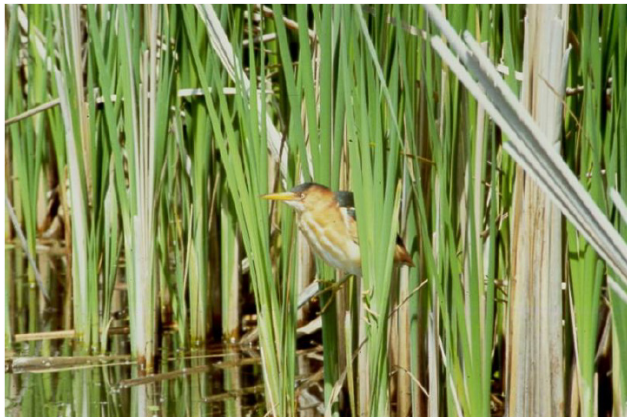


Photo credits: Sandy Muller, Irene Mazzocchi

Scientific Name *Ixobrychus exilis*
(Gmelin, 1789)

Family Name Ardeidae
Herons, Bitterns, and Egrets

Did you know?

When Least Bitterns are alarmed, instead of flying away they often freeze and point their bill upward to blend with the surrounding vegetation.

Summary

Protection Threatened in New York State, protected federally.

This level of state protection means: A native species likely to become an endangered species within the foreseeable future in New York (includes any species listed as federally Threatened by the United States). It is illegal to take, import, transport, possess, or sell an animal listed as Threatened, or its parts, without a permit from NYSDEC. 1) Any native species likely to become an endangered species within the foreseeable future in New York. 2) Any species listed as threatened by the U.S. Department of the Interior.

Rarity G5, S3B, S1N

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery. A state rarity rank of S3B,S1N means: Typically 21 to 100 breeding occurrences or limited breeding acreage and typically 5 or fewer non-breeding (usually winter residents) occurrences in New York State.

Conservation Status in New York

The first Breeding Bird Atlas (1980-1985) reported 142 blocks and the second Breeding Bird Atlas (2000-2005) reported 129 blocks (Andrle and Carroll 1988 and McGowan and Corwin 2008). It appears that populations have declined by about 9% when comparing the two atlases. One of the most significant threats to this species is loss of appropriate habitat. New York State has lost over half of its wetlands since colonization (Tiner 1984 cited in NatureServe 2003).

Short-term Trends

The first Breeding Bird Atlas (1980-1985) reported a total of 142 blocks with 62 of those blocks as probable or confirmed breeding (Andrle and Carroll 1988). The second Breeding Bird Atlas reported Least Bitterns from a total of 129 blocks. Seventy-two of those blocks were reported as probable and confirmed breeding (Andrle and Carroll 1988 and McGowan and Corwin 2008). A comparison of the two atlases shows a 9% decline in blocks in the state (McGowan and Corwin 2008). Least Bitterns are likely overlooked during breeding bird surveys because they rarely vocalize and so, are often not heard. Least Bittern data from the Breeding Bird Survey (BBS) are too few to assess population trends in New York (Sauer et al. 2007).

Long-term Trends

Historically, Least Bitterns were considered locally common in marshes of the Great Lakes Plain, the Coastal Lowlands, and the Hudson Valley, and possibly breeding in the Champlain Valley (Eaton 1910). In the southern and western portions of the state, Least Bitterns were considered uncommon and local (Bull 1974). Generally, this species is absent from high elevations. It is difficult to determine long term trends. This species is protected under the Migratory Bird Treaty Act. The Migratory Bird Treaty Act implements various treaties and conventions between the U. S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under this Act, taking, killing, or possessing migratory birds, including nests or eggs, is unlawful unless specifically permitted by other regulations.

Conservation and Management

Threats

New York State has lost over half of its wetlands since colonization (Tiner 1984 cited in NatureServe 2003). More recently, losses of wetlands in the Lake Plains portion of the state have been offset as agricultural lands revert back to wetlands, although net losses of wetlands in the Hudson Valley continue. Emergent marshes, which constitute only five percent of the state's 2.5 million acres, have declined overall. Equally important, the quality of remaining habitat is often degraded by fragmentation, exotic plants, and nutrient enrichment (Riexinger, personal communication, October 31, 2003). Run-off from development and agricultural practices may also negatively impact prey. Water level management of Lake Ontario may also change the quality of habitat for Least Bitterns (King 2005). Unnaturally high densities of predators may also pose a threat.

Conservation Strategies and Management Practices

Large wetlands (>12 acres) with abundant emergent vegetation need preservation, protection, and improvement (Gibbs and Melvin 1992). Prevent chemical contamination, siltation, eutrophication, and other forms of pollution in marsh habitats. Control invasive species (such as purple loosestrife) and predators at breeding sites. When managing large wetland complexes for waterfowl, consider retaining areas with cattails and bulrush.

Research Needs

Population distribution, size, and trend studies are needed. Additional studies are needed on the species' breeding biology and movements. Evaluate the effects of invasive species such as common reed and purple loosestrife on breeding populations.

Habitat

In New York, Least Bitterns tend to breed in shallow or deep emergent marshes, freshwater tidal marshes (lower Hudson River), or brackish tidal marshes (Long Island). They prefer stands of cattails or bulrush with bur-reed, sedges, or common reed. Stands of cattails are often interspersed with pools of open water or slow-moving channels and some woody vegetation. Large marshes are important breeding areas for this species. Open habitats such as mats of emergent vegetation are rarely used (Frederick et al. 1990 cited in NatureServe 2003).

Associated Ecological Communities

Brackish Tidal Marsh

A marsh community that occurs where water salinity ranges from 0.5 to 18.0 ppt, and water is less than 2 m (6 ft) deep at high tide. The vegetation in a brackish tidal marsh is dense and dominated by tall grass-like plants.

Deep Emergent Marsh

A marsh community flooded by waters that are not subject to violent wave action. Water depths can range from 6 in to 6.6 ft (15 cm to 2 m). Water levels may fluctuate seasonally, but the substrate is rarely dry, and there is usually standing water in the fall.



Freshwater Tidal Marsh

A marsh community that occurs in shallow bays, shoals, and at the mouth of tributaries of large tidal river systems, where the water is usually fresh (salinity less than 0.5 ppt), and less than 2 m (6 ft) deep at high tide. Typically there are two zones in a freshwater tidal marsh: a low-elevation area dominated by short, broadleaf emergents bordering mudflats or open water, and a slightly higher-elevation area dominated by tall grass-like plants.

Shallow Emergent Marsh

A marsh meadow community that occurs on soils that are permanently saturated and seasonally flooded. This marsh is better drained than a deep emergent marsh; water depths may range from 6 in to 3.3 ft (15 cm to 1 m) during flood stages, but the water level usually drops by mid to late summer and the soil is exposed during an average year.

Associated Species

American Bittern (*Botaurus lentiginosus*)

Marsh Wren (*Cistothorus palustris*)

Virginia Rail (*Rallus limicola*)

Identification Comments

Identifying Characteristics

Small size, yellow color, and a dark crown are characteristics that distinguish Least Bitterns from all other bitterns and herons (Hancock and Kushlan 1984 cited in NatureServe 2003). Diagnostic field characteristics include a vivid, greenish-black crown, back, and tail; brownish and white neck, sides, and underparts; and chestnut-colored wings with conspicuous, contrasting, pale-colored wing patches. No other small heron has large buffy patches on the upper side of the otherwise dark wings. Sexes are similar in size, but sexes are dimorphic. Females have a purple-chestnut crown and back and the neck is darkly streaked. Males have a black crown and back. Juveniles are similar to females, but the crown is more brown and paler and the breast and throat are browner and more heavily streaked. Nests are usually built over shallow water 0.3-3.3 ft (0.1-1.0 m) deep (Palmer 1962, Kushlan 1973, Aniskowicz 1981 cited in NatureServe 2003) and tend to be less than 33 ft (10 m) from open water (Weller 1961 cited in NatureServe 2003). A nesting platform with a canopy is made by pulling down and crimping surrounding emergent vegetation, such as cattail or bulrush (Weller 1961 cited in NatureServe 2003). Eggs are elliptical, pale blue or pale green, smooth and non-glossy, averaging 1.2 by 1 in (31 by 24 mm) (Bent 1926, Harrison 1978 cited in NatureServe 2003). The male's advertisement call, most frequently heard in spring, is a dove-like cooing characterized as "uh-uh-uh-uh-uh-oo-oo-oooo-oo-ooah" (Palmer 1962 cited in NatureServe 2003). Females may respond with "ticking" calls (Hancock and Kushlan 1984 cited in NatureServe 2003). When alarmed, three calls may be uttered: a loud, shrieking "quoh," a hissing "hah," or a cackling "tut-tut-tut" (Palmer 1962, Hancock and Kushlan 1984 cited in NatureServe 2003).

Behavior

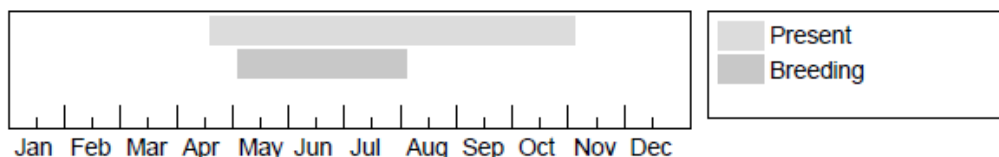
Least Bitterns spend nearly all their time in dense, grass-like vegetation. During the breeding season, the home range of Least Bitterns varies from 4.5-88.2 acres (1.8-35.7 hectares) with an average of 24 acres (9.7 hectares) in New York (Bogner and Baldassarre 2002).

Diet

The Least Bittern diet consists of small fishes, salamanders, tadpoles, frogs, leeches, slugs, crayfishes, dragonflies, and occasionally shrews and mice.

The Best Time to See

Least Bitterns are rarely seen in New York before late April and after September. The best time to see or hear adults is between May and July. This species is often heard and not seen. On rare occasions birds are reported during mid-winter along the coast.



The time of year you would expect to find Least Bittern in New York.

Similar Species

Green Heron (*Butorides virescens*): The Green Heron is similar in height but wider than the Least Bittern and lacks buff color on the head and wings. Green Herons are often found perched in trees.

American Bittern (*Botaurus lentiginosus*): The American Bittern is much larger and has rich brown underparts set off by black neck streaks.

Taxonomy

Kingdom Animalia
 Phylum Craniata
 Class Birds (Aves)
 Order herons, egrets, ibises, storks and spoonbills (Ciconiiformes)
 Family Ardeidae (Herons, Bitterns, and Egrets)

Additional Resources

Links

NatureServe Explorer

<http://natureserve.org/explorer/servlet/NatureServe?searchName=IXOBRYCHUS+EXILIS>

Google Images

<http://images.google.com/images?q=IXOBRYCHUS+EXILIS>

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Northern Harrier



Northern Harrier (*Circus cyaneus*)



Photo credits: Jeff Nadler

Scientific Name *Circus cyaneus*
(Linnaeus, 1766)

Family Name Accipitridae
Hawks and Eagles

Did you know?

Unlike most hawks, harriers can use their sense of hearing to help locate prey. Harriers have an owl-like facial disk to help with directional hearing and soft feathers for a quieter flight.

Summary

Protection Threatened in New York State, protected federally.

This level of state protection means: A native species likely to become an endangered species within the foreseeable future in New York (includes any species listed as federally Threatened by the United States). It is illegal to take, import, transport, possess, or sell an animal listed as Threatened, or its parts, without a permit from NYSDEC. 1) Any native species likely to become an endangered species within the foreseeable future in New York. 2) Any species listed as threatened by the U.S. Department of the Interior.

Rarity G5, S3B, S3N

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery. A state rarity rank of S3B,S3N means: Typically 21 to 100 breeding occurrences or limited breeding acreage and typically 20 to 100 non-breeding (usually winter residents) occurrences in New York State.

Conservation Status in New York

There were 354 probable and confirmed breeding blocks identified during the second Breeding Bird Atlas (McGowan and Corwin 2008) and 355 probable and confirmed breeding blocks identified during the first New York State Breeding Bird Atlas (1980-1985) (Andrle and Carroll 1988). However, these numbers could be deceptive since they are cumulative over several years and the birds occupy large breeding territories (i.e. individuals reported in more than one block). They are widespread in winter, but numbers are highly variable. There is concern about the status of Northern Harrier populations in New York because of the loss of farmland and wetlands throughout the state.

Short-term Trends

Northern Harrier populations vary with rodent populations, peaking about every five years. Breeding populations appear to be fairly stable when comparing the two breeding bird atlases of New York. During the first Breeding Bird Atlas (1980-1985), 355 probable or confirmed blocks were reported (Andrle and Carroll 1988). During the second Breeding Bird Atlas, probable or confirmed breeding was reported in 354 blocks (McGowan and Corwin 2008). Since Northern Harriers have a large home range, it is possible that individuals were reported in more than one block. Declines were noted by McGowan and Corwin (2008) in the Adirondacks, Coastal Lowlands, St. Lawrence Plains, and Tug Hill Plateau, while the number of reported blocks increased in the Champlain Valley to the northern Hudson Valley, Mohawk Valley, and Appalachian Plateau (McGowan and Corwin 2008). Breeding Bird Survey data show a possible decline of 3.8% per year between 1980 and 2006. Although, these findings were not found to be statistically

significant (Sauer et al. 2007). Non-breeding populations appear to be their highest during spring and fall migration (Levine 1998). Wintering populations fluctuate with prey abundance and snow cover, but appear to be fairly stable.

Long-term Trends

Until about the 1950s, breeding Northern Harriers were considered common throughout the state. Between the 1950s and 1960s the population started to decline for unknown reasons (Andrle and Carroll 1988, Levine 1998). The downward trend may be attributed to habitat loss ranging from reforestation and filling of wetlands to urban and industrial development (Serretino 1992). Although it is not certain, pesticide use may have also played a role in the population decline (Levine 1998). Breeding Bird Survey data show a possible decline of 3.0% per year from 1966 to 2006. Although, these findings were not determined to be statistically significant (Sauer et al. 2007). Wintering populations appear to be fairly stable. Northern Harriers have been known to winter in areas where they are locally extirpated as breeders (Serrentino 1992).

This species is protected under the Migratory Bird Treaty Act. The Migratory Bird Treaty Act implements various treaties and conventions between the U. S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under this Act, taking, killing, or possessing migratory birds, including nests or eggs, is unlawful unless specifically permitted by other regulations.

Conservation and Management

Threats

One of the most significant threats to Northern Harrier populations in New York is the loss of suitable grassland habitat. Economic factors have affected the viability of farms in New York. Many farmers have intensified their farming practices, converted hayfields to row crops, or abandoned farming altogether (Andrle and Carroll 1988, Post 2005). Remaining hayfields are often mowed earlier and more frequently to increase production. As a result, the mortality rate of young in those fields is high and sometimes adults are killed during mowing. As farms are abandoned they are lost to development or the land reverts to shrublands and forests. Grasslands are becoming more scattered and isolated thereby reducing connectivity (Post 2005). Another significant threat to Northern Harriers is the loss of wetland habitat by draining, dredging, and filling marshes (Evers 1992 cited in NatureServe 2003). New York State has lost over half of its wetlands since colonization (Tiner 1984 cited in NatureServe 2003). More recently, losses of wetlands in the Lake Plains portion of the state have been offset as agricultural lands revert back to wetlands, although net losses of wetlands in the Hudson Valley continue. Emergent marshes, which constitute only five percent of the state's 2.5 million acres, have declined overall. Equally important, the quality of remaining habitat is often degraded by fragmentation, exotic plants, and nutrient enrichment (Riexinger, personal communication, October 31, 2003). Ditching of salt marshes for mosquito control may have negative effects on breeding populations (Serrentino and England 1989).

Conservation Strategies and Management Practices

Large areas of open habitat in breeding and wintering areas need to be maintained in order to ensure the persistence of this species in New York. Potential management practices include burning, mowing, and plowing of fields after the breeding season. Use Landowner Incentive Program funds to conserve privately-owned grasslands. Coordinate conservation efforts with other agencies and organizations and initiate an outreach program (Post 2005). It may also be possible to design a management plan that would include other threatened species with similar habitat requirements, such as the Short-eared Owl.

Research Needs

Implement accurate and standardized survey methods to determine the population size in New York. Data should be collected on hunting habitat and roost site selection in various habitats such as salt marshes, freshwater wetlands, agricultural habitats, and maritime heaths. Determine the sizes of hunting ranges of birds during the breeding and non-breeding season at sites with varying densities and habitat types. Determine the causes of breeding failure



and mortality in young and adults. Conduct studies on the techniques used to maintain early successional habitats. Comparisons between treatments and the cost-effectiveness of each treatment are especially needed. Determine the amount and type of disturbances that breeding Northern harriers will tolerate. In coastal areas, determine the effect of salt marsh ditching on populations and their major prey species.

Habitat

Northern Harriers use a wide range of open grasslands, shrubland, and salt and freshwater marshes (Andrie and Carroll 1988, McGowan and Corwin 2008). Nests are placed on the ground, usually in dense cover.

Associated Ecological Communities

Brackish Meadow

A moist, moderately well-drained brackish (salinity 0.5-18 ppt) perennial grassland with occasional isolated shrubs that is typically situated in a belt at the upper edge of salt marshes bordering sandy uplands, but may occupy large portions of interdunal basins. The community usually develops in areas with a unique combination of soils and hydrology, on deep deposits of periodically windblown or overwashed gleyed sands that are usually flooded only during spring tides and during major coastal storms, approximately two to three times per year.

Brackish Tidal Marsh

A marsh community that occurs where water salinity ranges from 0.5 to 18.0 ppt, and water is less than 2 m (6 ft) deep at high tide. The vegetation in a brackish tidal marsh is dense and dominated by tall grass-like plants.

Deep Emergent Marsh

A marsh community flooded by waters that are not subject to violent wave action. Water depths can range from 6 in to 6.6 ft (15 cm to 2 m). Water levels may fluctuate seasonally, but the substrate is rarely dry, and there is usually standing water in the fall.

Dwarf Pine Plains

A woodland community dominated by dwarf individuals of pitch pine and scrub oak that occurs on nearly level outwash sand and gravel plains in eastern Long Island. The soils are infertile, coarse textured sands that are excessively well-drained.

Freshwater Tidal Marsh

A marsh community that occurs in shallow bays, shoals, and at the mouth of tributaries of large tidal river systems, where the water is usually fresh (salinity less than 0.5 ppt), and less than 2 m (6 ft) deep at high tide. Typically there are two zones in a freshwater tidal marsh: a low-elevation area dominated by short, broadleaf emergents bordering mudflats or open water, and a slightly higher-elevation area dominated by tall grass-like plants.

Hempstead Plains Grassland

A tall grassland community that occurs on rolling outwash plains in west-central Long Island. This community occurs inland, beyond the influence of offshore winds and salt spray.

High Salt Marsh

A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide up to the limit of spring tides. It is periodically flooded by spring tides and flood tides. High salt marshes typically consist of a mosaic of patches that are mostly dominated by a single graminoid species.

Low Salt Marsh

A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide down to mean sea level or to about 2 m (6 ft) below mean high tide. It is regularly flooded by semidiurnal tides. The mean tidal range of low salt marshes on Long Island is about 80 cm, and they often form in basins with a depth of 1.6 m or greater.



Maritime Grassland

A grassland community that occurs on rolling outwash plains of the glaciated portion of the Atlantic coastal plain, near the ocean and within the influence of offshore winds and salt spray.

Maritime Shrubland

A shrubland community that occurs on dry seaside bluffs and headlands that are exposed to offshore winds and salt spray.

Medium Fen

A wetland fed by water from springs and seeps. These waters are slightly acidic (pH values generally range from 4.5 to 6.5) and contain some dissolved minerals. Plant remains in these fens do not decompose rapidly and thus the plants in these fens usually grow on older, undecomposed plant parts of woody material, grasses, and mosses.

Salt Panne

A shallow depression in a salt marsh where the marsh is poorly drained. Pannes occur in both low and high salt marshes. Pannes in low salt marshes usually lack vegetation, and the substrate is a soft, silty mud. Pannes in a high salt marsh are irregularly flooded by spring tides or flood tides, but the water does not drain into tidal creeks. After a panne has been flooded the standing water evaporates and the salinity of the soil water is raised well above the salinity of sea-water.

Shallow Emergent Marsh

A marsh meadow community that occurs on soils that are permanently saturated and seasonally flooded. This marsh is better drained than a deep emergent marsh; water depths may range from 6 in to 3.3 ft (15 cm to 1 m) during flood stages, but the water level usually drops by mid to late summer and the soil is exposed during an average year.

Shrub Swamp

An inland wetland dominated by tall shrubs that occurs along the shore of a lake or river, in a wet depression or valley not associated with lakes, or as a transition zone between a marsh, fen, or bog and a swamp or upland community. Shrub swamps are very common and quite variable.

Successional Old Field

A meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned or only occasionally mowed.

Successional Shrubland

A shrubland that occurs on sites that have been cleared (for farming, logging, development, etc.) or otherwise disturbed. This community has at least 50% cover of shrubs.

Other Probable Associated Communities

Alvar grassland
Calcareous pavement barrens
Dwarf shrub bog
Inland salt marsh
Salt shrub
Successional northern sandplain grassland

Associated Species

Short-Eared Owl (*Asio flammeus*)

Identification Comments

Identifying Characteristics

The Northern Harrier is a slim, medium-sized hawk with long, broad wings and long legs and tail. There are two



features that are useful in identifying this species: a facial ruff that gives them an owl-like appearance and a white rump that is visible when in flight. Northern Harriers are known to fly low over fields and to hover in flight over prey. Sexes are dimorphic. Adult females are dark brown above and buffy below. There is some streaking in the underparts. The tail is barred. Males differ in that they are gray above and white below. Underparts have reddish spots. Wingtips are black. Males have brown dorsal markings until three to four years of age. Immature harriers are similar in appearance to females except they have a cinnamon-colored breast and the back and wings are darker brown. Immature plumage is retained until the following spring or summer. When laid, eggs are pale blue, but turn white after a few days. Some eggs have brown markings. Nests are built of grasses and sticks on the ground in thick vegetation of grassland or marshes. Northern harriers have a few vocalizations that are used in various situations. In general, the call is a weak, nasal whistle (“pee, pee, pee”). A “wailing squeal” is used by females to males and young to adults when begging for food. The same call can be heard during courtship. Incubating females may use a “quip, quip, quip” call.

Behavior

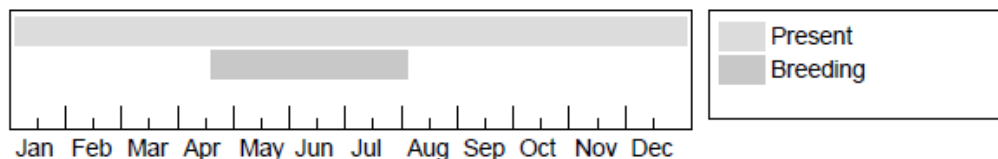
During the breeding season, males hunt farther away from the nest site than females. Northern Harriers are known to congregate during the winter months in open habitats with high rodent populations. They usually abandon wintering grounds with deep snow cover. They are known to share wintering grounds with other bird species, such as Short-eared Owls and Rough-legged Hawks.

Diet

Northern Harriers prey upon rodents and small birds.

The Best Time to See

Northern Harriers are found in New York throughout the year. During the breeding season, the best time to look for Northern Harriers is May through June. Concentrations of birds may be found in suitable habitat with abundant prey during the winter months.



The time of year you would expect to find Northern Harrier in New York.

Similar Species

Rough-Legged Hawk (*Buteo lagopus*): Northern Harriers and Rough-legged Hawks are found in similar habitats during the winter. Rough-legged Hawks are larger and have a white tail with dark bands. They lack the white rump patch that is present on Northern Harriers. Northern Harriers also have an owl-like facial ruff. Both species are known to hover in flight.

Short-Eared Owl (*Asio flammeus*): Northern Harriers have an owl-like facial disk which may cause some confusion when initially trying to distinguish them from Short-eared Owls. Short-eared Owls lack the distinctive white rump patch of Northern Harriers.

Taxonomy

Kingdom Animalia
 └─ Phylum Craniata
 └─ Class Birds (Aves)
 └─ Order Raptors (Falconiformes)
 └─ Family Accipitridae (Hawks and Eagles)

Additional Common Names

Marsh Hawk

Additional Resources

Links

NatureServe Explorer

<http://natureserve.org/explorer/servlet/NatureServe?searchName=CIRCUS+CYANEUS>

Google Images

<http://images.google.com/images?q=CIRCUS+CYANEUS>

New York State Department of Environmental Conservation

<http://www.dec.ny.gov/animals/7090.html>

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- Division of Lands & Forests, Department of Environmental Conservation
- New York State Office of Parks, Recreation and Historic Preservation



Pied-billed Grebe



Pied-billed Grebe (fall plumage)



Photo credits: Lee Karney, USFWS

Scientific Name *Podilymbus podiceps*
(Linnaeus, 1758)

Family Name Podicipedidae
Grebes

Did you know?

Both sexes build a large sodden, floating nest of rotting and green plant material and mud. The decomposition of plant material generates substantial quantities of heat, up to 11-13C higher than the surrounding water, providing enough heat to incubate the eggs in the adults' absence (Davis et al. 1984). Like other grebe species (Nuechterlein and Buitron 2002) this may afford the adults the ability to roost communally at night to minimize predation risk.

Summary

Protection Threatened in New York State, protected federally.

This level of state protection means: A native species likely to become an endangered species within the foreseeable future in New York (includes any species listed as federally Threatened by the United States). It is illegal to take, import, transport, possess, or sell an animal listed as Threatened, or its parts, without a permit from NYSDEC. 1) Any native species likely to become an endangered species within the foreseeable future in New York. 2) Any species listed as threatened by the U.S. Department of the Interior.

Rarity G5, S3B, S1N

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery. A state rarity rank of S3B,S1N means: Typically 21 to 100 breeding occurrences or limited breeding acreage and typically 5 or fewer non-breeding (usually winter residents) occurrences in New York State.

Conservation Status in New York

The pied-billed grebe was recorded as a probable or confirmed breeder in 150 USGS topographical quads during the second New York State Breeding Bird Atlas (2000-2005), and as a possible breeder in an additional 115 quads. Overall, the species is considered a rare to uncommon, local breeding species with many of the records clustered in areas of large wetland complexes. Although it was recorded in significantly more quads during the Atlas 2000 project in comparison with the first New York State Breeding Bird Atlas in the mid-1980's, Breeding Bird Survey records indicate a - 2.0% annual trend between 1980 and 2002 (New York State Department of Environmental Conservation 2006) and the species is state listed as Threatened. Loss of wetlands and other factors continue to pose threats to the species although a number of excellent occurrences are on protected state and federal wetland complexes.

Short-term Trends

Although Breeding Bird Survey data for 12 survey routes in New York between 1966-1989 showed a non-significant 0.6% decrease in abundance (Gibbs and Melvin 1992) another analysis shows a - 2.0 % annual trend from 1980-2002 (New York State Department of Environmental Conservation 2006). An increase in the number of Breeding Bird Atlas blocks where the species was either a probable or confirmed breeder from the first Atlas to the second (86 to 184) Atlas could reflect population increases, range expansion, or increased surveys efforts for marshbird species.

Long-term Trends

There is little data on which to base a long-term trend. However, considering the massive loss of wetlands in New York State over the past 100 years, it seems that pre-European population sizes must have been substantially higher. Heavy historical exploitation by humans, namely shooting for feathers and egg collecting, have abated since the turn of the 20th century. In the late 1800's large numbers were shot and sold to milliners and furriers who fashioned ear-muffs and hat ornaments from the silver-white breast and abdomen feathers (Bent 1919).

This species is protected under the Migratory Bird Treaty Act. The Migratory Bird Treaty Act implements various treaties and conventions between the U. S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under this Act, taking, killing, or possessing migratory birds, including nests or eggs, is unlawful unless specifically permitted by other regulations.

Conservation and Management

Threats

Currently, the greatest threat to this species is the ongoing alteration and loss of wetlands through draining, dredging, filling, pollution, invasive species and siltation from agricultural practices and roads. These threats lead to the degradation, isolation, and fragmentation of wetlands and have left many marshes that were too small, or were not part of larger marsh complexes, unsuitable for grebes and other marshbirds (New York State Department of Environmental Conservation 2006). Pollution and environmental contamination degrades the food web of wetland ecosystems and can impair the reproductive capacity of pied-billed grebes through the process of biomagnification. Popular organophosphate pesticides used heavily for agriculture have been directly implicated in the death of this species and elevated mercury levels have been detected in some individuals (Gibbs and Melvin 1992). Siltation and runoff from development and agriculture may also negatively impact populations of important prey species. Water level management on Lake Ontario and other large water bodies can alter marsh habitat and decrease the quality of historically utilized sites. In other cases, lack of stochastic events that produce a flushing effect may negatively impact marshbirds by promoting large monotypic stands of emergent vegetation. Invasive aquatic plants such as purple loosestrife crowd out native emergents and form stands too dense, and lacking sufficient open water interspersions, for some marshbird species including pied-billed grebes. Small, localized breeding populations are extremely vulnerable to stochastic events, such as storms, habitat loss, or human disturbance. (New York State Department of Environmental Conservation 2006). Grebes are sometimes mistaken for ducks by hunters and are accidentally shot. Television and cell towers pose an extreme danger to nocturnally migrating individuals, for example 65 pied-billed grebes died at a television tower in Florida between 1955 to 1980 (Muller and Storer 1999).

Conservation Strategies and Management Practices

Restoration of wetland habitat, improvement of water level control at managed wetlands, promotion of the Farm Bill Landowner Incentive Program to manage and restore appropriate habitat, reducing the spread of invasive exotic species, and controlling invasive species where they occur at sites occupied by grebes and other rare marshbirds, are all identified as important management actions beneficial to pied-billed grebes (New York State Department of Environmental Conservation 2006). Because pied-billed grebes will readily colonize wetland impoundments managed primarily for waterfowl, there is ample opportunity to make minor alterations to existing management schemes to improve nesting and foraging habitat for grebes. Since other secretive, rare marshbird species such as American bitterns, least bitterns, and black terns share habitat preferences with pied-billed grebes, management strategies could benefit multiple species of management concern. The conservation of relatively large (5-75 ha) wetlands with roughly a 50/50 interspersions of moderately shallow emergent vegetation and open water (the "hemi-marsh") is the most urgent management need for pied-billed grebes and other marsh-nesting birds. Dense stands of vegetation therefore need to be periodically opened up to retard succession. Properly managed muskrat populations often fulfill this role, but the process may need to be augmented by cutting, burning or flooding. Herbicide treatments are not recommended. Manipulation of water levels provides a cost-effective method for establishing moderately



dense stands of emergent vegetation while retaining open water areas preferred by grebes. However, water levels need to be maintained at a stable level during the nesting season to prevent flooding of nests and predator access. Complete drawdown should be avoided so as not to destroy major fish and odonate food items. The floating nests of grebes are easily washed over and capsized by wave action, so large motorized boats should be excluded from occupied marshes, and nesting areas should be protected from heavy recreational use to prevent disturbance of incubating birds (Gibbs and Melvin 1992). In general, pied-billed grebe's high reproductive potential (large clutch size, ability to re-nest following nest loss), in addition to its tolerance of a wide range of freshwater marsh habitats, suggests that management potential is high.

Research Needs

A number of research needs have been identified including: 1) Evaluation of habitat characteristics at multiple scales to better understand micro and macro habitat features important for nest site selection; 2) Conducting controlled experiments to see which management actions are effective locally in producing suitable habitat; 3) Conduct demographic studies at selected sites to identify source and sink populations; 4) Determine major migration stop-over sites and conduct studies of habitat use, prey availability, and diet at migratory staging and molting areas, as well as wintering grounds, to assess possible threats and limiting factors; 5) Investigate aspects of behavioral ecology, such as mate selection, mate fidelity, spacing behavior, coloniality, dispersal, and post fledging parental care; 6) Periodically monitor the levels of contaminants in birds and eggs to assess trends and determine effects on eggshell thinning, behavioral modification, chick development, nesting success, and juvenile survival; 7) Refinement of standardized survey techniques and implementation of programs to monitor population trends; 8) Conduct studies of the structural composition of wetland vegetation, water levels and quality, and wetland area and occupancy relationships during nesting and migration; 9) Evaluate the effects of invasion of non-native invasive marsh plants on grebe habitat suitability (Gibbs and Melvin 1992, New York State Department of Environmental Conservation 2006).

Habitat

Pied-billed grebes inhabit quiet marshes, marshy shorelines of ponds, shallow lakes, or marshy bays and slow moving streams with sedgy banks or adjacent marshes; rarely in brackish marshes with limited tidal fluctuation. Although plant species in breeding marshes may vary, a 50/50 combination ("hemi- marsh") of emergent vegetation interspersed with open water is desirable (Andrle and Carroll 1988). Grebes avoid dense emergent vegetation, and muskrats appear to play an important role in opening up dense cattail stands and providing cut stalks for nest construction. Ideal water depths for nesting range from 25 to 50 cm (Seyler 2003). Grebes set up breeding territories more commonly in wetlands impounded by beavers or humans than in those of glacial origin, and individual pairs appear to favor wetlands of intermediate size (0.6 - 7.0 ha) over very large or small wetlands (Gibbs and Melvin 1992).

Associated Ecological Communities

Backwater Slough

The aquatic community of quiet to stagnant waters in sloughs that form in embayments and old meanders that are cut off from an unconfined river or marsh headwater stream only at the upstream end by deposition of a levee.

Deep Emergent Marsh

A marsh community flooded by waters that are not subject to violent wave action. Water depths can range from 6 in to 6.6 ft (15 cm to 2 m). Water levels may fluctuate seasonally, but the substrate is rarely dry, and there is usually standing water in the fall.

Impounded Marsh

A marsh (with less than 50% cover of trees) in which the water levels have been artificially manipulated or modified, often for the purpose of improving waterfowl habitat.



Marsh Headwater Stream

The aquatic community of a small, marshy perennial brook with a very low gradient, slow flow rate, and cool to warm water that flows through a marsh, fen, or swamp where a stream system originates. These streams usually have clearly distinguished meanders (i.e., high sinuosity) and are in unconfined landscapes.

Shallow Emergent Marsh

A marsh meadow community that occurs on soils that are permanently saturated and seasonally flooded. This marsh is better drained than a deep emergent marsh; water depths may range from 6 in to 3.3 ft (15 cm to 1 m) during flood stages, but the water level usually drops by mid to late summer and the soil is exposed during an average year.

Other Probable Associated Communities

Shrub swamp

Associated Species

American Bittern (*Botaurus lentiginosus*)

Black Tern (*Chlidonias niger*)

American Coot (*Fulica americana*)

Common Moorhen (*Gallinula chloropus*)

Least Bittern (*Ixobrychus exilis*)

Identification Comments

Identifying Characteristics

Pied-billed grebes are small, stocky, poorly buoyant waterbirds, about 31-38 cm in length, with small, narrow wings, and feet placed far back, with a blunt-ended posterior. During the non-breeding period, the bill is unmarked, the throat is white, and the white rear becomes more conspicuous. As adults, the sexes are alike, whereas juveniles are distinguished by the lack of a white orbital ring, an unmarked bill, darker brown sides of the head and neck, and a whiter underbelly (Palmer 1962). Downy chicks have a zebra-like pattern of black and white stripes, interspersed with reddish-brown spots (Palmer 1962). VOCALIZATIONS: Territorial males have a distinctive prolonged call, a loud “cow-cow-cow-cow-cowcowp...cowp...cowp...”. Several other calls are also produced during the breeding season, but during the non-breeding season they are mostly silent. NEST: Grebes build sodden, floating nests of rotting and green plant material and mud averaging 38 cm in diameter (Glover 1953), often anchored to growing emergent plants. EGGS: Elliptical to subelliptical, approximately 44 x 30 mm, smooth and nonglossy (Harrison 1978). Although white or tinted bluish when laid, the eggs gather a heavy, brown stain from the wet, organic matter in the nest.

Best Life Stage for Identifying This Species

Mature adults are easiest to identify and the sexes are similar. However, the downy chicks of pied-billed grebes have a striking, zebra-like pattern of black and white stripes, interspersed with reddish-brown spots, that makes them readily identifiable as well.

Behavior

Grebe's are very secretive birds that will slowly submerge underwater with only their eyes and nostrils showing in order to escape danger. Downy chicks ride on the adults back, even when they dive underwater. Adults consume their own feathers and also feed them to young, presumably to protect the stomach and trap fish bones. Hard indigestible items are felted together with feathers and regurgitated as pellets. Grebes migrate nocturnally, landing before dawn at the nearest waterbody and are more social outside the breeding season. During breeding pied-billed grebes are an aggressive, highly territorial bird, threatening, chasing and attacking conspecifics and other species. They are reluctant to take flight, needing a long running start across open water to become airborne. Seasonally monagamous, both sexes build the nest and add plant material and mud as the season progresses and the nest slowly sinks. Air-pockets and trapped gases generated by the fermenting and rotting vegetation give buoyancy to the



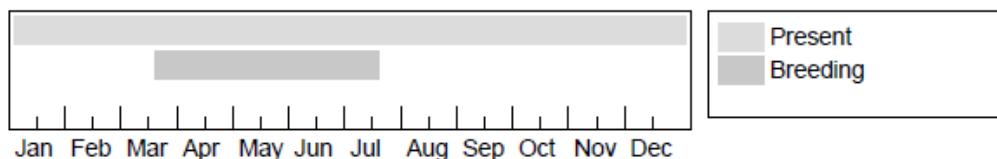
nest. The floating, rotting nest generates substantial quantities of heat (Davis et al. 1985) and may allow the adults to abandon the nest at night to avoid predation risk (Nuechterlein and Buitron 2002). The young are precocial, making their first successful catches of food (fish, insects) at 10-12 days post-hatching and they are capable of flight only 35 days after hatching.

Diet

Pied-billed grebes are opportunistic carnivores, the diet being dominated by crayfish (31% by volume), insects (46%), primarily Odonates (dragonflies), Heteroptera (true bugs), Coleoptera (beetles) and fish (24%), including catfish, eels, perch, sunfish, suckers, carp, sculpins, killifish, sticklebacks, and minnows. There is a strong seasonal shift in the diet, fish being most important during the nonbreeding season, while dragonfly nymphs constituted 34% of the diet in late summer and are an important food item for chicks (Muller and Storer 1999). The diet also includes smaller amounts of snails, small frogs, tadpoles, aquatic worms and leeches. In wetlands where fish are not prevalent, Ambystomatid salamander adults and larvae play a key role in the diet (Osnas 2003).

The Best Time to See

In New York, the pied-billed grebe is a rare to uncommon local breeder; a fairly common migrant, more numerous in the fall; and a rare but regular winter visitant (Levine 1998). Migratory grebes usually arrive on the nesting grounds by early March, shortly after ice out, and courtship commences in early April with nesting activity initiated by mid-April. The peak vocalization period for pied-billed grebes at study sites in western New York was from late-April through mid-May with breeding activity vocalizations dropping off through June (Lor and Maleki 2002).



The time of year you would expect to find Pied-billed Grebe in New York.

Similar Species

Common Moorhen (*Gallinula chloropus*): The moorhen's call can be mistaken for a pied-billed grebe's, but is more nasal. This species has a reddish forehead shield, yellow tipped bill, with a white streak on its flanks.

American Coot (*Fulica americana*): Coots have an all black body and pale bill extending onto the forehead.

Conservation Comments

Grebes are a family of diving birds with no living relatives. They may have once been related to Loons (Cotter and Spencer 1996).

Taxonomy

Kingdom Animalia
 └─ Phylum Craniata
 └─ Class Birds (Aves)
 └─ Order Grebes (Podicipediformes)
 └─ Family Podicipedidae (Grebes)

Additional Common Names

Hell Diver
Water Witch

Additional Resources

Links

NatureServe Explorer

<http://natureserve.org/explorer/servlet/NatureServe?searchName=PODILYMBUS+PODICEPS>

Google Images

<http://images.google.com/images?q=PODILYMBUS+PODICEPS>

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Short-eared Owl



Short-eared Owl (*Asio flammeus*)



Photo credits: A.J. Hand

Scientific Name *Asio flammeus*
(Pontoppidan, 1763)

Family Name Strigidae
Typical Owls

Did you know?

The short-eared owl is unique within its family (Strigidae) in the way it builds a ground nest. The female makes a small scrape in the ground with her body and lines it with nearby material (NatureServe 2003).

Summary

Protection Endangered in New York State, protected federally.

This level of state protection means: A native species in imminent danger of extirpation or extinction in New York (includes any species listed as federally Endangered by the United States). It is illegal to take, import, transport, possess, or sell an animal listed as Endangered, or its parts, without a permit from NYSDEC. 1) Any native species in imminent danger of extirpation or extinction in New York. 2) Any species listed as endangered by the United States Department of the Interior.

Rarity G5, S2

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery. A state rarity rank of S2 means: Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably make it very vulnerable in New York State.

Conservation Status in New York

The Short-eared Owl population is declining in New York, as it is throughout much its range. The second Breeding Bird Atlas reported probable or confirmed breeding in 13 blocks (McGowan and Corwin 2008). In comparison, the first Breeding Bird Atlas (1980-1985) reported probable or confirmed breeding in 14 blocks (Andrle and Carroll 1988). The number of reported possible breeding blocks declined from 22 during the first Atlas to 11 during the second Atlas. It appears that Long Island has lost nearly all breeding locations for Short-eared Owls with one block reported during the second Atlas compared to nine during the first Atlas. Breeding may no longer occur in the lower Hudson Valley as well as a number of other historically known breeding sites in the state. Wintering Short-eared Owl populations are variable, depending on rodent populations and snow cover.



Short-term Trends

Currently, it appears that populations are continuing to decline, although it may be difficult to determine trends due to the lack of precise location data from historical records (Schneider 2003). During the first Breeding Bird Atlas (1980-1985), there were five confirmed breeding records, nine probable breeding records, and 22 possible breeding records (Andrie and Carroll 1988). Data from the second Breeding Bird Atlas seems to indicate a decline with four blocks with confirmed breeding, nine blocks with probable breeding, and 11 blocks with possible breeding (McGowan and Corwin 2008). During the first Atlas, Short-eared Owls were recorded in nine blocks on Long Island, compared to one block during the second Atlas. Breeding may no longer occur in the lower Hudson Valley as well as a number of other historically known breeding sites in the state. Some records may be a single breeding event in an area with unusually high rodent populations. Overall, the distribution in New York is largely unchanged except for the reduction of reports on Long Island. Breeding Bird Survey data is too sparse in New York to determine trends. Wintering populations are variable depending on snow cover and rodent populations. It is difficult to determine winter population trends as few sites are surveyed on a regular basis.

Long-term Trends

During the early 20th century, Eaton (1914) reported short-eared owls as one of our most common owls outnumbering all other owls found in lowlands and marshes, especially in the winter. Approximately 60 years later, Bull (1974) described short-eared owl populations as declining with localized breeding reported.

This species is protected under the Migratory Bird Treaty Act. The Migratory Bird Treaty Act implements various treaties and conventions between the U. S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under this Act, taking, killing, or possessing migratory birds, including nests or eggs, is unlawful unless specifically permitted by other regulations.

Conservation and Management

Threats

The most significant threat to short-eared owls is habitat loss due to development, reforestation, wetland loss, and changes in farming practices such as conversion of hayfields to row crops or more frequent mowing of hayfields (Post 2004). As a ground-nesting bird, eggs and unfledged young are at risk of depredation by mammalian predators such as foxes, raccoons, and skunks. There is also increased risk of depredation by domestic and feral cats and dogs in areas with some development. A limiting factor for short-eared owls is their dependency on microtine rodent populations. Poisoning may be a threat in areas where humans are attempting to control rodent populations. As with many raptors, short-eared owls have been subjected to shooting by humans.

Conservation Strategies and Management Practices

Large areas of open habitat in breeding and wintering areas need to be maintained in order to ensure the persistence of this species in New York. Potential management practices include burning, mowing, and plowing of fields after the breeding season. Use Landowner Incentive Program funds to conserve privately-owned grasslands. Coordinate conservation efforts with other agencies and organizations and initiate an outreach program (Post 2004).

Research Needs

Population monitoring standards need to be developed and implemented to better estimate the local population status (distribution, abundance, and trends) during the breeding and non-breeding seasons. Current methods, such as flushing sitting females or roadside counts, are either labor and time intensive or result in under-estimating population sizes. More could be learned about nocturnal movements, migration patterns, adult and juvenile mortality, and the relationship between rodent abundance and territory size. Studies are needed on the effects of habitat management (i.e. burning, mowing, and plowing) on grassland birds (Post 2004) as well as small mammal populations.



Habitat

Open areas such as grasslands (hayfields, fallow farm lands, and pastures) and fresh and salt water marshes are typically used during the Short-eared Owl breeding season in New York. They tend to prefer habitats with some water which may be due to the habitat preference of voles, their primary prey. Day roosts are typically on the ground, but also may be under low shrubs, in conifers, or low open perches. During the winter months, Short-eared Owls use habitats similar to the those of the breeding season. They also can be found at old dumps where rodent populations may be high. They may move further south during winters with deep snow cover.

Associated Ecological Communities

Cropland/field Crops

An agricultural field planted in field crops such as alfalfa, wheat, timothy, and oats. This community includes hayfields that are rotated to pasture.

High Salt Marsh

A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide up to the limit of spring tides. It is periodically flooded by spring tides and flood tides. High salt marshes typically consist of a mosaic of patches that are mostly dominated by a single graminoid species.

Low Salt Marsh

A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide down to mean sea level or to about 2 m (6 ft) below mean high tide. It is regularly flooded by semidiurnal tides. The mean tidal range of low salt marshes on Long Island is about 80 cm, and they often form in basins with a depth of 1.6 m or greater.

Successional Old Field

A meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned or only occasionally mowed.

Other Probable Associated Communities

Dwarf shrub bog
Salt panne
Successional blueberry heath
Successional fern meadow

Associated Species

Northern Harrier (*Circus cyaneus*)

Identification Comments

Identifying Characteristics

Short-eared Owls are a small to medium-sized owl. They are characterized by their barely visible ear tufts and a whitish facial disk with a dark area around bright yellow eyes. The back and upper wings are tawny brown to buff colored with some streaking. The ventral surface is much lighter with bold vertical streaking on the breast and a pale belly that is lightly streaked. Wings are long with a buffy patch beyond the wrist. They have a distinct black carpal bar. There is a dark patch at the base of the primaries. Legs and feet are feathered. Sexes are similar. Generally, females are darker than males; young birds are darker than older birds. Juveniles have a dark facial disk that lightens with age. They have full adult plumage by October of the first year. Short-eared Owl flight is described as “moth or bat-like”. Wing beats are unhurried and irregular. They fly low over grasslands or marshes. Females make a simple nest by creating a small depression in the ground and lining it with grass, leaves, twigs, or feathers. Eggs are white, short, elliptical, smooth, and non-glossy. Short-eared Owls are generally silent, but do occasionally vocalize. Males will make a muffled “poo, poo, poo” sound. Both sexes have an alarm call that is described as nasal barks and wheezy



notes (“cheef, cheef, cheef” and “cheewaay”). Young owls have a food-begging call (“pssssip”). Both adults and young will clack their bills when annoyed or in defense. In flight, Short-eared Owls will clap their wings making the sound similar to that of a cracking whip.

Behavior

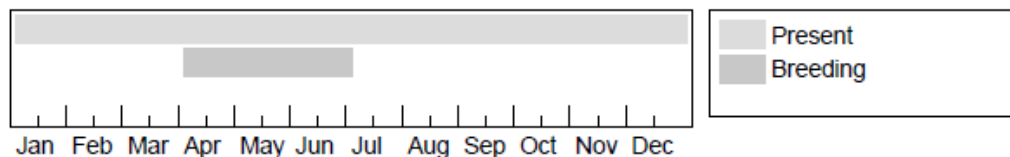
Short-eared Owls detect prey by coursing open areas while flying low to the ground. They may briefly hover over prey before taking it. At times, they hunt from a perch. Short-eared Owls were observed caching prey during the winter in Jefferson County (G.A. Smith, pers. Comm. cited in NatureServe 2003). There are three displays most commonly observed during the breeding season: wing-clapping, exaggerated wing-beats, and skirmishing. These behaviors are usually performed in territorial defense or courtship. Skirmishes can be aggressive in nature. The male Short-eared Owl courtship display is in flight and involves vocalization, a spiraling flight, and wing-clapping (NatureServe 2003).

Diet

Microtine rodents are the preferred prey. However, Short-eared Owl prey also includes other small mammals and sometimes birds. Young may also take insects (NatureServe 2003).

The Best Time to See

During the breeding season, the best time to observe Short-eared Owls would be between March and April when courtship and territorial defense begin. There is an increased likelihood of observing birds during the fall and early winter while birds are migrating to their wintering grounds in the state. Short-eared Owls are found on their wintering grounds from early winter to late winter or early spring.



The time of year you would expect to find Short-eared Owl in New York.

Similar Species

Northern Harrier (*Circus cyaneus*): Northern Harriers have an owl-like facial disk which may cause some confusion when initially trying to distinguish them from Short-eared Owls. Short-eared Owls lack the distinctive white rump patch of Northern Harriers.

Taxonomy

Kingdom Animalia
 Phylum Craniata
 Class Birds (Aves)
 Order Owls (Strigiformes)
 Family Strigidae (Typical Owls)

Additional Resources

Links

NatureServe Explorer
<http://natureserve.org/explorer/servlet/NatureServe?searchName=ASIO+FLAMMEUS>

Google Images
<http://images.google.com/images?q=ASIO+FLAMMEUS>

New York State Department of Environmental Conservation
<http://www.dec.ny.gov/animals/7080.html>



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 36. Hairy Woodpecker photograph by Brian Oyer. Available at: https://www.allaboutbirds.org/guide/Hairy_Woodpecker/id
 37. Yellow-bellied Sapsucker photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#6018283073933378114>
 38. Olive-sided Flycatcher photograph by Michael J. Anderson. Available at: https://www.allaboutbirds.org/guide/Olive-sided_Flycatcher/id
 39. Eastern Wood-Pewee photograph by Luke Theodorou. Available at: https://www.allaboutbirds.org/guide/Eastern_Wood-Pewee/id
 40. Alder Flycatcher photograph by Luke Seitz. Available at: https://www.allaboutbirds.org/guide/Alder_Flycatcher/id
 41. Least Flycatcher photograph by Cameron Rognan. Available at: https://www.allaboutbirds.org/guide/Least_Flycatcher/id
 42. Willow Flycatcher photograph by Kelly Azar. Available at: https://www.allaboutbirds.org/guide/Willow_Flycatcher/id
 43. Great Crested Flycatcher photograph by Cleber Ferreira. Available at: https://www.allaboutbirds.org/guide/Great_Crested_Flycatcher/id
 44. Eastern Phoebe photograph by Kelly Azar. Available at: https://www.allaboutbirds.org/guide/Eastern_Phoebe/id
 45. Eastern Kingbird photograph by Christopher L. Wood. Available at: https://www.allaboutbirds.org/guide/Eastern_Kingbird/id
 46. Warbling Vireo photograph by Alberto Lopez. Available at: https://www.allaboutbirds.org/guide/Warbling_Vireo/id
 47. Red-eyed Vireo photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#6018283169428708658>
 48. American Crow photograph by Kevin J. McGowan. Available at: https://www.allaboutbirds.org/guide/American_Crow/id
 49. Blue Jay photograph by Gary Mueller. Available at: https://www.allaboutbirds.org/guide/Blue_Jay/id
 50. Purple Martin photograph by Cameron Rognan. Available at: https://www.allaboutbirds.org/guide/Purple_Martin/id
 51. Barn Swallow photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#5675790993360632834>
 52. Northern Rough-winged Swallow photograph by Kelly Azar. Available at: https://www.allaboutbirds.org/guide/Northern_Rough-winged_Swallow/id
 68. Tree Swallow photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#5675790838979038770>
 53. Tree Swallow photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#567579083897903877>
 54. Tufted Titmouse photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#5675791229981005074>
 55. Black-capped Chickadee photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#5675790957822679378>
 56. White-breasted Nuthatch photograph by Matt MacGillivray. Available at: https://www.allaboutbirds.org/guide/White-breasted_Nuthatch/id
 57. Brown Creeper photograph by Kelly Azar. Available at: https://www.allaboutbirds.org/guide/Brown_Creeper/id
 58. Marsh Wren photograph by Kelly Azar. Available at: https://www.allaboutbirds.org/guide/Marsh_Wren/id
 59. House Wren photograph by Gary Mueller. Available at: https://www.allaboutbirds.org/guide/House_Wren/id
 60. Winter Wren photograph by Dwayne Java. Available at: https://www.allaboutbirds.org/guide/Winter_Wren/id
 61. Blue-gray Gnatcatcher photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#5749512994232202578>
 62. Veery photograph by Bill Benish. Available at: <https://www.allaboutbirds.org/guide/Veery/id>
 63. Wood Thrush photograph by Eddie Callaway. Available at: https://www.allaboutbirds.org/guide/Wood_Thrush/id
 64. Eastern Bluebird photograph by Beth Donald. Available at: https://www.allaboutbirds.org/guide/Eastern_Bluebird/id
 65. American Robin photograph by Christopher L. Wood. Available at: https://www.allaboutbirds.org/guide/American_Robin/id
 66. Gray Catbird photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#5675790866394157138>
 67. Northern Mockingbird photograph by Brian L. Sullivan. Available at: https://www.allaboutbirds.org/guide/Northern_Mockingbird/id
 68. Brown Thrasher photograph by Ed Schneider. Available at: https://www.allaboutbirds.org/guide/Brown_Thrasher/id
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69. European Starling photograph by L. Massman. Available at: https://www.allaboutbirds.org/guide/European_Starling/id
70. Cedar Waxwing photograph by Ben Thomas. Available at: https://www.allaboutbirds.org/guide/Cedar_Waxwing/id
71. Canada Warbler photograph by Christopher L. Wood. Available at: https://www.allaboutbirds.org/guide/Blue-winged_Warbler/id
72. Prairie Warbler photograph by Andy Jackson. Available at: https://www.allaboutbirds.org/guide/Prairie_Warbler/id
73. Yellow Warbler photograph by Jim Mc Cree. Available at: https://www.allaboutbirds.org/guide/Yellow_Warbler/id
74. Common Yellowthroat photograph by Gerrit Vyn Photography. Available at: https://www.allaboutbirds.org/guide/Common_Yellowthroat/id
75. Ovenbird photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#6018283099981544834>
76. Louisiana Waterthrush photograph by Matt Bango. Available at: https://www.allaboutbirds.org/guide/Louisiana_Waterthrush/id
77. Cerulean Warbler photograph by Bryan Hix. Available at: https://www.allaboutbirds.org/guide/Cerulean_Warbler/id
78. American Redstart photograph by Gerrit Vyn Photography. Available at: https://www.allaboutbirds.org/guide/American_Redstart/id
79. Golden-winged Warbler photograph by Rachel Vallender. Available at: <http://www.acris.nynhp.org/guide.php?id=7044>
80. Blue-winged Warbler photograph by Gerry Dewaghe. Available at: https://www.allaboutbirds.org/guide/Blue-winged_Warbler/id
81. Scarlet Tanager photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#6018283024292127282>
82. Grasshopper Sparrow photograph by Corey Hayes. Available at: https://www.allaboutbirds.org/guide/Grasshopper_Sparrow/id
83. Dark-eyed Junco photograph by Christopher L. Wood. Available at: https://www.allaboutbirds.org/guide/Dark-eyed_Junco/id
84. Swamp Sparrow photograph by Gerrit Vyn Photography. Available at: https://www.allaboutbirds.org/guide/Swamp_Sparrow/id
85. Song Sparrow photograph by Kevin Bolton. Available at: https://www.allaboutbirds.org/guide/Song_Sparrow/id
86. Savannah Sparrow photograph by Michaela Sagatova. Available at: https://www.allaboutbirds.org/guide/Savannah_Sparrow/id
87. Eastern Towhee photograph by Greg Bishop. Available at: https://www.allaboutbirds.org/guide/Eastern_Towhee/id
88. Vesper Sparrow photograph by Gerrit Vyn Photography. Available at: https://www.allaboutbirds.org/guide/Vesper_Sparrow/id
89. Clay-colored Sparrow photograph by Christopher L. Wood. Available at: https://www.allaboutbirds.org/guide/Clay-colored_Sparrow/id
90. Chipping Sparrow photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#5749514928618390162>
91. Field Sparrow photograph by Kelly Azar. Available at: https://www.allaboutbirds.org/guide/Field_Sparrow/id
92. White-throated Sparrow photograph by Jim Paris. Available at: https://www.allaboutbirds.org/guide/White-throated_Sparrow/id
93. Northern Cardinal photograph by Kevin Bolton. Available at: https://www.allaboutbirds.org/guide/Northern_Cardinal/id
94. Indigo Bunting photograph by Kelly Azar. Available at: https://www.allaboutbirds.org/guide/Indigo_Bunting/id
95. Red-winged Blackbird photograph by Laura Erickson. Available at: https://www.allaboutbirds.org/guide/Red-winged_Blackbird/id
96. Bobolink photograph by Jim Mc Cree. Available at: <https://www.allaboutbirds.org/guide/Bobolink/id>
97. Baltimore Oriole photograph by Bryan Hix. Available at: <https://www.flickr.com/photos/bdhixphotos/5806718471/>
98. Brown-headed Cowbird photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#5675791481954458066>
99. Common Grackle photograph by Paul Anderson, Cayuga Bird Club. Available at: <https://picasaweb.google.com/103035821827588507778/CayugaBasinBirds?feat=flashslideshow#5675790887289038834>
100. Eastern Meadowlark photograph by Joe Povenz. Available at: https://www.allaboutbirds.org/guide/Eastern_Meadowlark/id
101. American Goldfinch photograph by Keith Bowers. Available at: https://www.allaboutbirds.org/guide/American_Goldfinch/id
102. House Finch photograph by Richard Lee. Available at: https://www.allaboutbirds.org/guide/House_Finch/id
103. Purple Finch photograph by Nancy Castillo. Available at: https://www.allaboutbirds.org/guide/Purple_Finch/id
104. House Sparrow photograph by Robert J. Baker. Available at: https://www.allaboutbirds.org/guide/House_Sparrow/idd
105. Black Tern photograph by Kurt Kirchmeier. Available at: https://www.allaboutbirds.org/guide/Black_Tern/id
106. Pied-billed Grebe photograph by Gerrit Vyn Photography. Available at: https://www.allaboutbirds.org/guide/Pied-billed_Grebe/id



NYS CONSERVATION RESOURCE GUIDES-PLANTS

This section contains conservation resource guides from the NY Natural Heritage Program for the two types of plants found in the Village of Union Springs Local Waterfront Revitalization Area that are listed as either Threatened or Endangered in New York State.

Note: The format and pagination of the conservation guides has been modified to reduce the number of overall pages in this document; however, the content of the guides is exactly as produced by the NY Natural Heritage Program including any spelling or grammatical errors.



Copper's Milkvetch



Astragalus neglectus plant in fruit



Photo credits: Stephen M. Young

Scientific Name *Astragalus neglectus*
(Torr. & Gray) Sheldon

Family Name Fabaceae
Pea Family

Did you know?

Asa Gray first named this species *Astragalus cooperi* in honor of William Cooper (1798-1864), noted American naturalist and discoverer of the species (Gray 1859). He was one of the founders of the New York Lyceum of Natural History (later the New York Academy of Sciences), and the first American member of the Zoological Society of London. The Cooper's hawk is named after him (Wikipedia contributors) and he was the person who, in 1830, discovered Hart's-tongue fern at Chittenango Falls.

Summary

Protection Endangered in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 5 or fewer extant sites, or 2) fewer than 1,000 individuals, or 3) restricted to fewer than 4 U.S.G.S. 7 1/2 minute topographical maps, or 4) species listed as endangered by U.S. Department of Interior.

Rarity G4, S1

A global rarity rank of G4 means: This species is apparently secure globally (typically with more than 100+ populations), though it may be quite rare in parts of its range, especially at the periphery. A state rarity rank of S1 means: This plant is endangered/critically imperiled in New York because of extreme rarity (typically 5 or fewer populations or very few remaining individuals) or is extremely vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

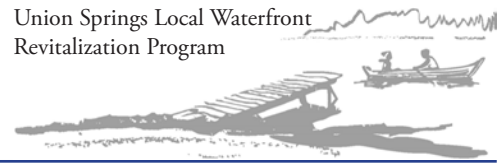
There are three existing populations that have fewer than 50 plants each. There are 23 historical locations, mostly known from the late 1800s and early 1900s up to 1942. Most of these locations have either not been searched in detail for this species or have been extirpated.

Short-term Trends

Existing populations are small and threatened by invasive species.

Long-term Trends

It looks like there has been a substantial decline in populations over the last 100 years. There have been recent botanical inventories in the areas where there are historical populations and no plants have been found. Many of the limestone areas where this plant occurred have been taken over by black swallow-wort and other invasives.



Conservation and Management

Threats

One population is threatened by black swallow-wort, as are many of the limestone areas with historical records of Cooper's Milkvetch.

Conservation Strategies and Management Practices

Infestations of exotic invasive species should be suppressed around known populations.

Research Needs

Research is needed to see if populations can be augmented at known sites.

Habitat

In New York, milk vetch is known from shale cliffs and deep ravines with rich, calcareous forests, with a single historical record from a lakeside shale cliff (New York Natural Heritage Program 2013). River banks and lakeshores, especially on limestone (Gleason & Cronquist 1991). Marshy to dry open, sometimes rocky, clearings, shores, thickets, and river banks; often in calcareous sites (Voss 1985). Calcareous gravels, talus and cliffs (Fernald 1970).

Associated Ecological Communities

Hemlock-northern Hardwood Forest

A mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. Eastern hemlock is present and is often the most abundant tree in the forest.

Maple-basswood Rich Mesic Forest

A species rich hardwood forest that typically occurs on well-drained, moist soils of circumneutral pH. Rich herbs are predominant in the ground layer and are usually correlated with calcareous bedrock, although bedrock does not have to be exposed. The dominant trees are sugar maple, basswood, and white ash.

Shale Cliff And Talus Community

A community that occurs on nearly vertical exposures of shale bedrock and includes ledges and small areas of talus. Talus areas are composed of small fragments that are unstable and steeply sloping; the unstable nature of the shale results in uneven slopes and many rock crevices.

Other Probable Associated Communities

Calcareous cliff community

Calcareous talus slope woodland

Associated Species

Sugar Maple (*Acer saccharum*)

Tall Thimbleweed (*Anemone virginiana*)

Bristleleaf Sedge (*Carex eburnea*)

New Jersey Tea (*Ceanothus americanus*)

Red Cedar (*Juniperus virginiana*)

Pale Vetchling Peavine (*Lathyrus ochroleucus*)

Tulip Tree (*Liriodendron tulipifera*)

Hophornbeam (*Ostrya virginiana*)

Roundleaf Ragwort (*Packera obovata*)

Canadian Lousewort (*Pedicularis canadensis*)

Hoary Mountain-mint (*Pycnanthemum incanum*)

Fragrant Sumac (*Rhus aromatica*)



Purple Flowering Raspberry (*Rubus odoratus*)
American Basswood (*Tilia americana*)
Mapleleaf Viburnum (*Viburnum acerifolium*)
Downy Arrow-wood (*Viburnum rafinesquianum*)

Identification Comments

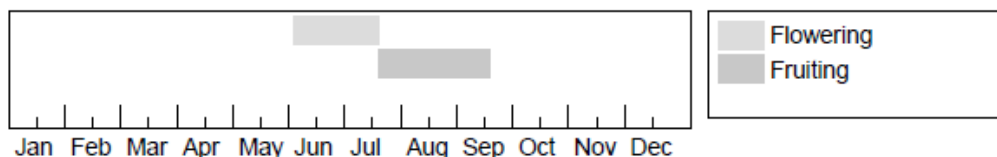
Astragalus neglectus is an erect perennial with hollow branching stems, growing in clusters up to 90 cm tall from the crown of a taproot. The stems are nearly smooth (glabrous) or with only simple hairs and not rhizomatous. The leaves are pinnately compound with 10 to 23 leaflets each. The flowers are shaped like pea flowers, white or tinged with violet, and 1.2 to 1.4 cm long with a short basal ear-shaped appendage (auricle). They are borne in lax racemes (clusters) on stalks which are either shorter than or barely exceeding their subtending leaves. The fruit are erect, one-chambered pods, borne sessilely from a calyx covered in black hairs. The pods themselves are inflated, egg-shaped, and 1.5 to 2 cm long with short beaks (Fernald 1950).

Best Life Stage for Identifying This Species

A complete plant with roots, leaves and either fruit or flowers is needed for a positive identification.

The Best Time to See

Astragalus neglectus typically flowers from June through mid-July, with fruits persisting nearly to the first frost.



The time of year you would expect to find Copper's Milkvetch in New York.

Similar Species

Only two other *Astragalus* species are reported from New York (*A. canadensis* and *A. glycyphyllos*). The fruit of both *A. canadensis* and *A. glycyphyllos* are two-chambered (bilocular), and scarcely inflated, in contrast to the inflated unilocular pods of *A. neglectus*. *A. neglectus* may also appear similar to species of the genus *Vicia*, but these species can be distinguished by their uninflated more pea-like fruits.

Taxonomy

Kingdom Plantae
Phylum Anthophyta
Class Dicots (Dicotyledoneae)
Order Fabales
Family Fabaceae (Pea Family)

Additional Common Names

Cooper Milk-vetch
Milk-vetch

Synonyms

Astragalus cooperi (A. Gray)
Phaca neglecta (Torrey & A. Gray)

Additional Resources

Links

Google Images

<http://images.google.com/images?q=ASTRAGALUS+NEGLECTUS>

NatureServe Explorer

<http://natureserve.org/explorer/servlet/NatureServe?searchName=ASTRAGALUS+NEGLECTUS>

USDA Plants Database

<http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=ASTRAGALUS+NEGLECTUS>

Conservation Assessment of Cooper's Milkvetch - USDA Forest Service Eastern Region

http://www.fs.fed.us/r9/wildlife/tes/ca-overview/docs/plant_Astragalus_neglectus-Coopers_Milkvetch.pdf

NY Flora Atlas

<http://newyork.plantatlas.usf.edu/Plant.aspx?id=1393>

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- New York State Office of Parks, Recreation and Historic Preservation



Handsome Sedge

Carex formosa line drawing



Scientific Name *Carex formosa*
Dewey

Family Name Cyperaceae
Sedge Family

Did you know?

The specific epithet *formosa* means finely formed, handsome, and beautiful (Stearns 2004). While a very beautiful plant, at least to those that enjoy sedges, this plant is perhaps no more handsome than many of its closest relatives. It must be its charisma that brings out its true beauty.

Photo credits: Britton, N.L., and A. Brown (1913); downloaded from USDA-Plants Database.

Summary

Protection Threatened in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 6 to fewer than 20 extant sites, or 2) 1,000 to fewer than 3,000 individuals, or 3) restricted to not less than 4 or more than 7 U.S.G.S. 7 1/2 minute topographical maps, or 4) listed as threatened by U.S. Department of the Interior.

Rarity G4, S2

A global rarity rank of G4 means: This species is apparently secure globally (typically with more than 100+ populations), though it may be quite rare in parts of its range, especially at the periphery. A state rarity rank of S2 means: This plant is threatened/imperiled in New York because of rarity (typically 6-20 populations or few remaining individuals) or is vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There are twelve known populations and at least 20 additional historical locations. Only three populations have more than 100 stems. There is some speculation that this sedge is overlooked, but it also has a very limited habitat and is distinct to those familiar with sedges. More survey work is needed at the various historical sites, as well as other areas with promising habitat.

Short-term Trends

Of the 11 extant sites known about 8 were first documented within the past 20 years. These populations were probably overlooked in the past because this species is similar to other ones, the window for identification is small, and *Carex* species are often overlooked. One known site has recently been impacted by road construction but the full



extent of this impact is unknown. Overall, there is no clear short term trends for this species.

Long-term Trends

Two historical populations are believed to have been extirpated due to housing development and agricultural practices. There are about an additional 15 populations which are only known from over 50 years ago. It is unknown if these populations are still extant. There are at least three populations which have been known for over 50 years. About 8 populations were recently documented but they may have been overlooked in the past. Overall the long term trends are unclear but may represent a slight decline.

Conservation and Management

Threats

Residential development poses a potential threat at a few sites. Exotic species are a potential threat at one site. Logging and changes in hydrology are potential threats although this species may not be negatively impacted by logging if invasive species are kept at bay.

Conservation Strategies and Management Practices

At least six extant populations have under 50 plants present. Regular monitoring of these populations over time will help to understand if these small populations indicate a downward trend, are merely a part of a fluctuating cycle, or represent an average population size for this species.

Research Needs

Surveys need to be conducted to all historical populations.

Habitat

Carex formosa occurs in forests, forest edges, road sides, or less frequently in open meadows. The soils vary from fairly dry to mesic to occasionally seasonally or perennially wet although these wet soils are often actually adjacent to the populations. It occurs in areas where the bedrock is limestone or the soils are calcareous. A good place to look for this species is in limestone forests (New York Natural Heritage Program 2005). Mesic to dry deciduous forests and ravines, moist meadows, usually associated with calcareous soils (Waterway 2002). Dry calcareous woods (Rhoads and Block 2000). Moist soil in woods and thickets (Gleason and Cronquist 1991). Calcareous woods, thickets and meadows (Fernald 1970).

Associated Ecological Communities

Appalachian Oak-hickory Forest

A hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants. The dominant trees include red oak, white oak, and/or black oak. Mixed with the oaks, usually at lower densities, are pignut, shagbark, and/or sweet pignut hickory.

Calcareous Cliff Community

A community that occurs on vertical exposures of resistant, calcareous bedrock (such as limestone or dolomite) or consolidated material; these cliffs often include ledges and small areas of talus.

Calcareous Talus Slope Woodland

An open or closed canopy community that occurs on talus slopes composed of calcareous bedrock such as limestone or dolomite. The soils are usually moist and loamy; there may be numerous rock outcrops.

Hemlock-northern Hardwood Forest

A mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. Eastern hemlock is present and is often the most abundant tree in the forest.



Limestone Woodland

A woodland that occurs on shallow soils over limestone bedrock in non-alvar settings, and usually includes numerous rock outcrops. There are usually several codominant trees, although one species may become dominant in any one stand.

Other Probable Associated Communities

Maple-basswood rich mesic forest
Successional northern hardwoods
Successional old field
Successional southern hardwoods

Associated Species

Red Maple (<i>Acer rubrum</i>)	Hophornbeam (<i>Ostrya virginiana</i>)
Sugar Maple (<i>Acer saccharum</i>)	Buckthorn (<i>Rhamnus cathartica</i>)
Limestone Meadow Sedge (<i>Carex granularis</i>)	Eastern Poison Ivy (<i>Toxicodendron radicans</i>)
Shagbark Hickory (<i>Carya ovata</i>)	American Elm (<i>Ulmus americana</i>)
Silky Dogwood (<i>Cornus amomum</i>)	Southern Arrowwood (<i>Viburnum dentatum</i> var. <i>lucidum</i>)
White Ash (<i>Fraxinus americana</i>)	Northern Prickly-ash (<i>Zanthoxylum americanum</i>)
Herb-robert (<i>Geranium robertianum</i>)	

Identification Comments

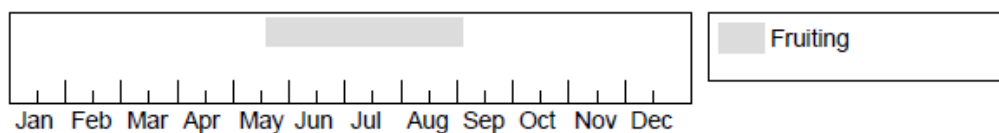
Carex formosa is a densely tufted perennial grass like plant. Its leaves are strap like and 3-7 mm wide. Leaves at the base of the plants have maroon bases. Arising from the leaves at the bases of the plants are stalks that are 30-80 cm tall. Coming off the upper part of the stalks are secondary branches with elongated clusters of small inconspicuous flowers/fruits at the tips. The secondary branches and flower clusters arch. The flowers mature into small green fruits (perigynia) 3.5-5.0 mm long (Waterway 2002).

Best Life Stage for Identifying This Species

This species is difficult to distinguish from many similar species when vegetative. The best time for identification is when the plants are in immature to mature fruit but the fruits are not yet easily shedding.

The Best Time to See

This species is in immature to mature fruit from late May till mid-August or even later, especially in the northern parts of NY. Towards the end of this season the fruits are starting to shed easily and early on in this season the fruits are not ripe enough for easy identification. Therefore, surveys are most successful from early June until early July or a little later in northern New York.



The time of year you would expect to find Handsome Sedge in New York.

Similar Species

Carex formosa is in section Hymenochlaenae affectionately known as the green dangly jobs which characterizes the dangling lateral spikes at maturity. There are numerous other species in this section that occur in New York including *C. aestivalis*, *C. arctata*, *C. castanea*, *C. davisii*, *C. debilis*, *C. gracillima*, *C. prasina*, *C. sprengelii*, *C. sylvatica*, and *C. venusta*. Many of these are superficially similar. *Carex formosa* differs from all of them in having lateral spikes with a few staminate flowers at the base vs. being entirely pistillate or in *C. sylvatica* and *C. sprengelii* being pistillate, staminate, or androgynous (staminate flowers above and pistillate below). Other differences include:



Carex gracillima (one of the most common members in much of NY) and *C. aestivalis* have beakless and shorter perigynia. In addition, *C. gracillima* has generally glabrous foliage.

Carex debilis and *C. arctata* (both fairly common in NY) as well as *C. castanea* mostly have staminate terminal spikes. In addition *C. debilis* and *C. arctata* have glabrous leaf blades.

Carex sylvatica and *C. sprengelii* have brown or non-maroon basal sheath bases as well as elongated beaks (2.0-3.0 mm and 1.7-4.0 mm long respectively.)

Carex davisii like *C. formosa* has a preference for calcareous soils but is more of a southern and midwestern species at the northern edge of its range in NY. It has larger perigynia 4.5-6.0 mm long and pistillate scales with elongated awns (2.5-3 mm long vs. less than 1.0 mm long for *C. formosa*).

Carex prasina is fairly distinct compared to *C. formosa*. It has spikes that are closer together, glabrous blue green foliage, and perigynia with two main veins but otherwise veinless (compared to 7-12 fine veins for *C. formosa*).

Carex venusta is confined to Long Island, in NY, where *C. formosa* is not known to occur. *Carex venusta* has glabrous leaf blades and larger perigynia (4.6-9 mm long) (Gleason and Cronquist 1991, Waterway 2002).

Conservation Comments

Carex formosa is currently placed in section *Hymenochlaenae* but will probably be moved to another section once further studies are completed (Waterway 2002).

Taxonomy

Kingdom Plantae
└─ Phylum Anthophyta
 └─ Class Monocots (Monocotyledoneae)
 └─ Order Cyperales
 └─ Family Cyperaceae (Sedge Family)

Additional Common Names

Sedge

Additional Resources

Links

USDA Plants Database

<http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=CAREX+FORMOSA>

NatureServe Explorer

<http://natureserve.org/explorer/servlet/NatureServe?searchName=CAREX+FORMOSA>

New York Flora Atlas

<http://www.newyork.plantatlas.usf.edu/Plant.aspx?id=1073>

Google Images

<http://images.google.com/images?q=CAREX+FORMOSA>

Flora of North America

http://efloras.org/florataxon.aspx?flora_id=1&taxon_id=242357198

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