



## Appendix A6:

# **Comprehensive Wildlife Conservation Strategy Species Group Reports for Mammals**

Prepared by New York State Department of Environmental Conservation staff in cooperation with Cazenovia College and the Riverhead Foundation for Marine Research in support of the Comprehensive Wildlife Conservation Strategy prepared for New York as required by the United States Fish and Wildlife Service's State Wildlife Grants Program

*27-Sep-05*

## **Taxa Group: Mammal**

### **Species Group: Allegheny Woodrat**

#### **Threats:**

An experimental release and radio-tracking project conducted by DEC at two sites at the Mohonk Preserve, Ulster County, in 1990 resulted in the recovery of 22 of the 50 animals that were monitored. All died within one year of the release. Twelve animals were suitable for complete necropsies. Of these 11 contained at least one raccoon roundworm *Baylisascaris procyonis* larvae in the brain, which was determined to be the cause of death. The 12th had sign of infection but no worm was located. Subsequent surveys revealed that parasite levels at other extirpated sites were similar or higher than those at the study sites (McGowan 1993).

It appears that the widespread contamination of woodrat habitat by infected raccoon feces, in combination with both raccoon and woodrat behavior, is the primary cause of extirpation in New York and a major component of the decline in other portions of its range ((McGowan 1993 , Logiudice 2003, Owen et al 2004)

#### **Trends:**

Although not widely distributed in the state, this species has a long history here. There is a carbon dated record as early as 25,000 years B.P. from a specimen collected within a cave in the town of Bethlehem Albany County (David Steadman, Florida Museum of Natural History, pers com) and there is a regular record of occurrence at archeological sites in southeastern NY (Funk and Steadman 1974, Funk 1976 ). Within historical times the first museum specimen was collected near Piermont, Rockland county, in 1855 (US National Museum accession # 375, 38468). Existing records suggest that woodrats inhabited islands of habitat formed by the talus slopes and creviced rocky outcropping, of southeastern NY primarily within the Hudson Highlands and the Schuanguk ridge. The species distribution appears to have been bounded to the east by the Hudson River although Goodwin (1935) reported seeing a specimen collected at Skunemunk Mt. on the NY CT border that apparently no longer exists. It seems unlikely that the species could have existed on the east side of the Hudson on a regular basis without being more widely known from that region.

Woodrats were documented throughout its historical range as recently as the mid 1960's and appears to be occupying all available habitat at that time. The first evidence of decline was noted by Daniel Smiley (Mohonk NY) in 1977 in and around what is now the Mohonk Preserve, Ulster County. Surveys initiated by DEC in 1979 found old evidence of occupation wherever suitable habitat existed within the historical range but found only 5 sites occupied. Staff were able to live capture more than two animals at only one site, Storm King Mountain, Orange county. By the spring of 1987 only 2 males could be captured there. Both were removed and provided to the Baltimore zoo (Baltimore MD) for captive propagation (DEC files).

Currently, the only woodrats in the state are immigrants which occasionally occupy a small patch of habitat on the New York- New Jersey border. This is the northern extreme of the habitat for the last remaining New Jersey woodrat population.

A similar decline is noted throughout the northern portions of the species range New Jersey has just one population but that appears to be persisting. (Melissa Craddock New Jersey Fish and Game, pers com). The woodrat in Maryland has been in decline for over two decades and continues to decline (Dan Feller, Maryland Natural Heritage Program, pers com). Pennsylvania's population is still widely distributed but is increasingly more fragmented and slowly declining (Cal Butchcoski Pennsylvania Game Commission, pers com.). The West Virginia population appears to be stable in most areas (Craig Stihler, West Virginia Department of Natural Resources, pers com ).

#### **SEQR - No Action Alternative:**

It appears that the woodrat continues to decline slowly throughout the region. A lack of action to repopulate currently

suitable, but historically extirpated sites, will eventually result in a lack of source populations to sustain the species in the Northeast. Regional extirpation is likely to result in the species becoming a candidate for federal listing and extirpation from all nearby states.

### Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Allegheny woodrat ( <i>Neotoma magister</i> )		X	S1	G3G4	E	Resident

### Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Allegheny woodrat ( <i>Neotoma magister</i> )	Upper Hudson  Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing

### Species Distribution - Ecoregion

Species	Historical	Current	Stability
Allegheny woodrat ( <i>Neotoma magister</i> )	Lower New England Piedmont	Lower New England Piedmont	Decreasing

### Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Allegheny woodrat ( <i>Neotoma magister</i> )	all	Terrestrial	alpine/mountain	cliffs & open talus

### Goal and Objectives for Allegheny Woodrat

**Goal: To restore a secure breeding population of the Allegheny woodrat within the state of New York.**

**Objective 1 :** Determine if apparently suitable woodrat sites can sustain a population by conducting and monitoring an experimental release.

**Measure:** *Monitor survival and reproductive success of released animals.*

**Objective 2 :** Determine if suitable sites (low raccoon latrine densities) remain favorable over multiple years

**Measure:** *Resurvey apparently suitable sites for two additional years*

**Objective 3 :** Determine when, or if, historical sites are again suitable for occupation by woodrats

**Measure:** *Compare raccoon latrine densities and roundworm infection rates with rates at extant sites at the five largest (or otherwise most suitable) historical woodrat sites in the state.*

## Recommended Actions

### Habitat monitoring:

- \* Monitor raccoon latrine densities within historical woodrat sites following the protocol designed by DEC in 1990 (DEC files)

### Relocation/reintroduction:

- \* Conduct a experimental release of woodrats at appropriate sites and monitor the results through radio tracking and live trapping.

## References

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**Taxa Group: Mammal**

**Species Group: Extirpated large mammals**

**Threats:**

All large mammals that were extirpated from all or large portions of the state were perceived as particularly desirable as a source of food or income, or particularly undesirable as a potential threat to life or livelihood and were unable to cope with changes associated with European intrusions. Those considered particularly desirable have largely returned (white-tailed deer, moose, beaver). Of those that have not, the wolf, cougar are still perceived as threats. The elk today is considered largely incompatible with all but low density human populations. The lynx was likely on the edge of its range in New York and probably could not adjust to the additional pressure from trapping and hunting. The issues for all extirpated species remain the same today. Is there enough habitat for them to meet their needs and, equally important, is the public willing to accept and accommodate their presence?

**Trends:**

Large mammals were extirpated as the last of their habitat was occupied by Europeans. The last reported elk was shot in Alleghany county in 1834 (Dekay 1842), the last cougar, wolf and lynx disappeared around the turn of the twentieth century from the Adirondack region (Miller 1899, Merriam 1899). These species were extirpated from the entire Northeast and there are no established populations of wolves or cougars in the area today. A large-scale release of lynx into the Adirondacks during the late 1980's failed to result in the establishment of a population (DEC files) although a few of that species have recently been confirmed in Northern Maine. Efforts to gauge public support for wolf restoration in NY during the mid 1990's suggested that opposition was still too strong at that time (Duda 1996, Hodgson 1997, Paquet et al 1999)

**SEQR - No Action Alternative:**

No action in regards to these species will maintain the status quo

Species in the Group and their Management Status						
Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Eastern cougar ( <i>Felis concolor cougar</i> )	E		SX	G5TH	E	Resident
Canada lynx ( <i>Lynx canadensis</i> )	T	X	SX	G5	G	Resident
Gray wolf ( <i>Canis lupus</i> )	E		SX	G4	E	Resident

Species Distribution - Watershed Basin			
Species	Historical	Current	Stability

**Species Distribution - Watershed Basin**

Species	Historical	Current	Stability
Gray wolf (Canis lupus)	Upper Hudson	Unknown	Unknown
	SW Lake Ontario		
	Susquehanna		
	SE Lake Ontario		
	NE Lake Ontario - St. Lawrence		
	Lower Hudson - Long Island Bays		
	Lake Erie		
	Lake Champlain		
	Delaware		
	Allegheny		
Canada lynx (Lynx canadensis)	Upper Hudson	Unknown	Unknown
	Lake Champlain		
	NE Lake Ontario - St. Lawrence		
Eastern cougar (Felis concolor cougar)	Upper Hudson	Unknown	Unknown
	SW Lake Ontario		
	Susquehanna		
	SE Lake Ontario		
	NE Lake Ontario - St. Lawrence		
	Lower Hudson - Long Island Bays		
	Lake Erie		
	Lake Champlain		
	Delaware		
	Allegheny		

**Species Distribution - Ecoregion**

Species	Historical	Current	Stability
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Species Distribution - Ecoregion			
Species	Historical	Current	Stability
Gray wolf ( <i>Canis lupus</i> )	Western Allegheny Plateau	Unknown	Unknown
	St. Lawrence-Lake Champlain Valley		
	Northern Appalachian/Boreal Forest		
	North Atlantic Coast		
	Lower New England Piedmont		
	High Allegheny Plateau		
	Great Lakes		
Canada lynx ( <i>Lynx canadensis</i> )	Northern Appalachian/Boreal Forest	Unknown	Unknown
Eastern cougar ( <i>Felis concolor cougar</i> )	Western Allegheny Plateau	Unknown	Unknown
	St. Lawrence-Lake Champlain Valley		
	Northern Appalachian/Boreal Forest		
	North Atlantic Coast		
	Lower New England Piedmont		
	High Allegheny Plateau		
	Great Lakes		

Critical Habitats for Species in the Group				
Species	Life Stage or Use	System	SubSystem	Habitat
Gray wolf ( <i>Canis lupus</i> )	all	Terrestrial	unknown	unknown
Canada lynx ( <i>Lynx canadensis</i> )	all	Terrestrial	alpine/mountain	northern deciduous
	all	Terrestrial	alpine/mountain	northern deciduous
Eastern cougar ( <i>Felis concolor cougar</i> )	all	Terrestrial	unknown	unknown



### Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Eastern cougar (Felis concolor cougar)				

### Goal and Objectives for Extirpated large mammals

**Goal:** To restore all extirpated mammals to the state of NY when it is biologically feasible and socially acceptable

**Objective 1 :** Implement restoration for appropriate candidates, and monitor the results.

**Measure:** *maintaining a self sustaining population for at least 25 years.*

**Objective 2 :** In the event that social consent is obtained, then a biological assessment of the likelihood of a successful restoration is appropriate.

**Measure:** *Greater than 70% likelihood of there being a self sustaining population over the next 50 years*

**Objective 3 :** Informally monitor public attitudes towards extirpated mammals to determine when a species might become a socially appropriate candidate. Conduct more formal attitude surveys at that time.

**Measure:** *There are no formal measures or specific action levels relating to public consent for restoration; those will be a judgment call by decision makers. Informal measures would include determining the level of consent among an informed public.*

**Objective 4 :** Monitor confirmed reports of currently extirpated species including determining the source of any collected animals.

**Measure:** *Investigate or respond to 100% of reports that are confirmed through indisputable physical evidence.*

**Objective 5 :** Secure habitat patches of sufficient quality, size, and distribution, so as to maintain or improve the potential for future large mammal restoration.

**Measure:** *% of the landscape that is maintained as potential habitat.*

### Recommended Actions

**Habitat research:**

- \* Conduct biological assessment for species shown to be socially acceptable.

## Recommended Actions

### Other action:

- \* Conduct public attitude surveys when decision makers are of the opinion that there is a reasonable chance of public support for the restoration of an extirpated species.

### Relocation/reintroduction:

- \* Restore species believed likely to succeed and that are socially acceptable and monitor their progress.

## References

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- Merriam, C. H. 1899. The vertebrates of the Adirondack region, Northeastern NY. Transactions of the Linnaean society of New York vol 1. 167 pp
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## **Taxa Group: Mammal**

### **Species Group: Furbearers**

#### **Threats:**

American marten and river otter are harvested (trapped) furbearer species. In the case of American marten, their range is generally thought to be restricted to portions of northern New York. Historically (prior to 1990), river otter primarily occupied northern New York, and most of eastern New York, in an area roughly east and southeast of Syracuse. Both marten and otter harvest are carefully regulated and mandatory reporting requirements are in place. Marten trapping is further restricted because special permits are required and submission of biological specimens (carcasses) are required to facilitate population modeling and harvest monitoring. Presently river otter are the most valuable furbearer harvested in New York, with individual animals valued at \$100 or more. Marten are highly valued as well, with the strongest market evidently based on the sale of full taxidermy mounts. Both species require careful monitoring to ensure that sustained yield harvest regimens are in place. In the 1990s, river otter were moved from places where they are abundant to watershed basins where they were absent or scarce. Since that time, the fur market for otter pelts became highly robust and market demands appear very strong. River otter in most of central and western New York require careful monitoring to gauge the effect of potential unlawful or accidental harvesting (primarily in conjunction with beaver trapping), and to evaluate the success of the restoration project. The annually reported harvest of American marten is highly variable with reports ranging from a low of 14 to a high of 225 in the last five years, making an accurate assessment of population status using harvest data is very difficult. In the absence of such assessments, the confidence that martens are managed in a sustained yield manner is weakened. Since martens and their prey consume beechnuts, changes in forest health (e.g., the spread of beech bark disease) may have long term negative consequences on marten populations. Moreover, the potential effects of long-term climate change on forest health and habitat suitability for martens should be monitored. In Central and Western New York, otter/vehicle collisions are a significant source of mortality.

#### **Trends:**

The population trend of American marten is poorly understood because only harvest-based indices are currently available. Martens in New York are an isolated population within the geographic (northeast) region. New York's population is not contiguous with other populations. Furthermore, since most martens are harvested through the use of food attractants (i.e., baits), the harvest is greatly affected by temperatures (energy requirements) and the availability of natural marten foods such as small mammals and beechnuts. While their population in the core range appears to be stable, or even possibly increasing, their population density or population trend has not been fully documented. The high variation in reported harvest means that those data are not useful for population monitoring. Additional harvest-independent data are required to draw sound conclusions about the status of martens in New York. Since the historical date selected for this assessment (1990), the river otter range has expanded because of the Department of Environmental Conservation's actions to establish river otter in central and western New York. However, since the restoration effort was completed (2000), active monitoring has not been thorough enough to establish a clear picture of their population status. While otters are reported in the restoration area, reliable measures of population trend are not available. In the Northern Atlantic Coast ecoregion (Lower Hudson River and Long Island Bays), river otters are occasionally reported. These anecdotal and poorly documented sightings lead to uncertainty about their status in saltwater, estuarine, and brackish environments.

#### **SEQR - No Action Alternative:**

Failure to monitor population status of river otter and American marten may result in failure to detect significant population change, and to match management actions to population status.

**Species in the Group and their Management Status**

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
American marten ( <i>Martes americana</i> )			S3	G5	G	Resident
River otter ( <i>Lontra canadensis</i> )			S5	G5	G	Resident

**Species Distribution - Watershed Basin**

Species	Historical	Current	Stability
River otter ( <i>Lontra canadensis</i> )	Delaware	Lake Champlain	Stable
	Upper Hudson	Susquehanna	Stable
	NE Lake Ontario - St. Lawrence	Delaware	Stable
	Lake Champlain	Upper Hudson	Stable
	Susquehanna	SW Lake Ontario	Unknown
	SE Lake Ontario	NE Lake Ontario - St. Lawrence	Stable
	Allegheny	Allegheny	Unknown
	Lake Erie	Lake Erie	Unknown
	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	SW Lake Ontario	SE Lake Ontario	Stable
American marten ( <i>Martes americana</i> )	NE Lake Ontario - St. Lawrence	Upper Hudson	Unknown
	Lake Champlain	Lake Champlain	Unknown
	Upper Hudson	NE Lake Ontario - St. Lawrence	Unknown

**Species Distribution - Ecoregion**

Species	Historical	Current	Stability
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Species Distribution - Ecoregion			
Species	Historical	Current	Stability
River otter ( <i>Lontra canadensis</i> )	Great Lakes	Northern Appalachian/Boreal Forest	Stable
	Lower New England Piedmont	Lower New England Piedmont	Stable
	St. Lawrence-Lake Champlain Valley	St. Lawrence-Lake Champlain Valley	Stable
	Northern Appalachian/Boreal Forest	Western Allegheny Plateau	Unknown
	High Allegheny Plateau	North Atlantic Coast	Unknown
	North Atlantic Coast	High Allegheny Plateau	Unknown
	Western Allegheny Plateau	Great Lakes	Unknown
American marten ( <i>Martes americana</i> )	Northern Appalachian/Boreal Forest	Northern Appalachian/Boreal Forest	Unknown

Critical Habitats for Species in the Group				
Species	Life Stage or Use	System	SubSystem	Habitat
River otter ( <i>Lontra canadensis</i> )	all	Estuarine	unknown	unknown
	all	Lacustrine	cold water deep	mud bottom
	all	Lacustrine	cold water deep	rocky bottom
	all	Lacustrine	cold water deep	sand/gravel bottom
	all	Lacustrine	cold water deep	SAV
	all	Lacustrine	cold water shallow	mud bottom
	all	Lacustrine	cold water shallow	rocky bottom
	all	Lacustrine	cold water shallow	sand/gravel bottom
	all	Lacustrine	cold water shallow	SAV
	all	Lacustrine	warm water deep	mud bottom
	all	Lacustrine	warm water deep	rocky bottom
	all	Lacustrine	warm water deep	sand/gravel bottom
	all	Lacustrine	warm water deep	SAV
	all	Lacustrine	warm water shallow	mud bottom
	all	Lacustrine	warm water shallow	rocky bottom
	all	Lacustrine	warm water shallow	sand/gravel bottom
	all	Lacustrine	warm water shallow	SAV
	all	Riverine	coldwater stream	mud bottom
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom

American marten (*Martes americana*)

### Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
American marten ( <i>Martes americana</i> )	all	Terrestrial	alpine/mountain	northern coniferous
	all	Terrestrial	forested	mixed deciduous/coniferous
	all	Terrestrial	forested	northern coniferous

### Goal and Objectives for Furbearers

**Goal:** Establish or maintain river otter and American marten populations in all areas of suitable habitat.

**Objective 1 :** On an annual and long term basis, determine the population status (distribution and population trend) of river otter and American marten in watershed basins where population status is unknown by April 1st of each year.

**Measure:** *Population status trends will be reported and used in support of the development of statewide management plans, and implementation of regulatory decisions to ensure population viability in support of the goal.*

### Recommended Actions

**Habitat research:**

- \* Monitor production of important food supplies for marten via regional (northeastern) mast monitoring project (I.e., beechnuts) to evaluate relationships between food availability, marten populations, and marten harvest.
- \* Assess potential marten habitat outside of the core marten range in the central Adirondacks, and evaluate limiting factors affecting range expansion.

**Life history research:**

- \* For American marten, evaluate through research relationships between home range and population dynamics related to fluctuations in food resources and forest health (e.g., beech bark disease).

**Other action:**

- \* Develop methods to mathematically model available harvest-based information to predict marten and river otter population trends, and to define sustainable harvest levels. For river otter, analyze DNA samples from restored otters and compare that data with all otter recovered from the restoration area.

## Recommended Actions

### Population monitoring:

- \* The primary conservation need for river otter and American marten is the development of robust measures of population status to inform management actions, primarily adjustment of trapping regulations and reporting requirements. Moreover, non-harvest-based data are needed to develop harvest independent measures of population status. The potential to develop methods to "mark" marten through unique "fingerprints" should be assessed (this technique appears valid for fisher studies).

### Statewide management plan:

- \* Based on the development of robust measures of population status, statewide management plans will be established and implemented, including identification of watershed basins where marten or river otter populations should be augmented through direct action.

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**Taxa Group: Mammal**

**Species Group: Game species of concern**

**Threats:**

We do not know why this species is in decline. It is clear that the New England cottontail is continuing to decrease in distribution and is being replaced by the eastern cottontail (*Sylvilagus floridanus*). However, it is not certain that there is a causal relationship, or if there is, the degree of causality. Changing habitat and development within its historical range may be a contributing factor (Amaral 2004).

**Trends:**

The historical record of the New England cottontail is clouded because of the similarity of appearance with the eastern cottontail and a lack of museum specimens to confirm what species was being discussed by early authors. We do know of extant specimens collected as far north as Lake George in 1907 (USNM specimen #150680) and west of the Hudson River in the Kaaterskill region of the Catskills in 1896 (USNM specimen #83111). Connor (1971) believed it was historically the predominate species on Long Island. More recent distribution is thought to be limited to the east side of the Hudson River. In the 1960's the species was still found in Rennselaer county (Benton and Atkinson 1964). Low intensity surveys since the 1980's suggests its distribution has declined still further and is now limited to the counties of Dutchess, Putman, Westchester and Columbia where its exists in a few fragmented populations (Clark 2002, 2003, 2004). A greater survey effort may well expand its distribution within the state. There has been a similar decline across the rest of the species range in New England and the species is now under review for listing as threatened or endangered under the endangered species act (Amaral 2004).

**SEQR - No Action Alternative:**

if current trends continue, the species faces certain extirpation from New York State and possible extinction range wide within the next few decades.

Species in the Group and their Management Status						
Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
New England cottontail ( <i>Sylvilagus transitionalis</i> )		X	SH	G4	G SC	Resident

Species Distribution - Watershed Basin			
Species	Historical	Current	Stability
New England cottontail ( <i>Sylvilagus transitionalis</i> )	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing
	Upper Hudson	Upper Hudson	Decreasing
	Lake Champlain		



### Species Distribution - Ecoregion

Species	Historical	Current	Stability
New England cottontail ( <i>Sylvilagus transitionalis</i> )	Lower New England Piedmont	Lower New England Piedmont	Decreasing

### Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
New England cottontail ( <i>Sylvilagus transitionalis</i> )	all	Terrestrial	forested	northern deciduous
	all	Terrestrial	forested	northern deciduous

### Goal and Objectives for Game species of concern

#### Goal: Insure the perpetuation of the New England Cottontail in New York state

- Objective 1 :** Within 5 years resolve the issues of historical distribution and the taxonomic status of *S. transitionalis* verses *S. obscurus* to the extent possible.
- Measure:** *Resolve the confusion surrounding the taxonomic status of S. transitionalis and S. obscurus based on a rigorous review of current information by qualified taxonomists.*
- Objective 2 :** Within the next 5 years gain a thorough understanding of the species current boundaries of its distribution within the state.
- Measure:** *define where the species is and is not located*
- Objective 3 :** Within the next 5 years gain a thorough understanding of the species distribution and density within those boundaries.
- Measure:** *Define population density and distribution with its range*
- Objective 4 :** Within the next 5 years, identify the likely causes of the decline and begin implementing actions to reverse their effects.
- Measure:** *Change in population resulting from the application of various potential remedies.*

### Recommended Actions

## Recommended Actions

### Habitat research:

- \* Compare the habitat within extant and extirpated sites to see if there are significant differences between the two .

### Habitat restoration:

- \* If significant habitat characteristics are found, identify suitable areas within the historical range and modify the habitat to the advantage of the species. Reintroduce the species to that area if necessary.

### Other action:

- \* conduct an investigation into the taxonomic separation of *S. transitionalis* and *S. obscurus* and determine if in fact they deserve separate status.

### Population monitoring:

- \* Conduct high intensity surveys in and around the areas where the species is discovered during low intensity surveys to better understand their local distribution.
- \* Continue low intensity surveys of the distribution of NEC through fecal collections. Conduct follow- up live trapping where animals are detected for confirmation . These surveys will be conducted throughout the region where the species had been detected since the early 1960's. (Washington to Westchester co)

## References

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**Taxa Group: Mammal**

**Species Group: Indiana Bat**

**Threats:**

The reason for the overall decline of this species, and the reason for the decline occurring primarily in the southern regions, continues to be a mystery (US Fish and Wildlife Service 1999). For the time being, the Indiana bat appears to be secure in New York as populations are stable to increasing (Hicks and Novak 2002). The Indiana bat in New York is most important as a standard of a success in the face of a range-wide decline, and as a means of understanding the causes of the decline. The only obvious long term potential threat to the species in the state will likely be widespread development in the lower elevation regions of the lower Hudson Valley, where roughly 70% of the state's population winters. Although apparently capable of doing well in suburban settings, Indiana bats appear to need interspersed patches of undeveloped mature woods as maternity roosts and feeding areas. We do not know how densely developed a region can be before the species is put in jeopardy. Widespread development of wind turbines and other tall structures may also present a risk to migrants, although the degree of risk, if any, is unknown at this time. There is some concern that the warming of hibernacula temperatures may be a cause of decline in the southern portions of the species range.

**Trends:**

Indiana bats is listed as endangered by both the Federal government and the State of New York (US Fish and Wildlife Service 1999). It comprises roughly 7% of the wintering bats counted to date in the state; the second most common species by number (Hicks 2003,Hicks and Novak 2002). However they are found in just 10 of the roughly 140 caves and mines surveyed to date, with 80% wintering in just three mines. (Hicks 2003,Hicks and Novak 2002) New York's wintering population of roughly 33,000 of the federally endangered Indiana bat and numbers within the state appear to be at least stable and probably increasing (Hicks 2003). New York harbors 9% of the range wide population and the fourth largest state total. (Clawson 2002). The state's contribution to the Indiana bat population continues to grow in importance as range wide numbers continue to drop.

**SEQR - No Action Alternative:**

Given recent population trends it seems unlikely that the species will be at risk of extirpation from New York within the next ten years. However, without New York's involvement, it is unlikely that the cause of the overall decline will be identified and addressed. A continued downward trend range wide will continue to elevate the importance of New York's population and the need for more rigorous protective measures.

Species in the Group and their Management Status						
Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Indiana bat ( <i>Myotis sodalis</i> )	E		S1	G2	E	Resident

Species Distribution - Watershed Basin			
Species	Historical	Current	Stability

Species Distribution - Watershed Basin			
Species	Historical	Current	Stability
Indiana bat ( <i>Myotis sodalis</i> )	Lake Champlain	Lower Hudson - Long Island Bays	Increasing
	Lower Hudson - Long Island Bays	Upper Hudson	Increasing
	Upper Hudson	SE Lake Ontario	Increasing
	SE Lake Ontario	NE Lake Ontario - St. Lawrence	Stable
	NE Lake Ontario - St. Lawrence	Lake Champlain	Increasing

Species Distribution - Ecoregion			
Species	Historical	Current	Stability
Indiana bat ( <i>Myotis sodalis</i> )	St. Lawrence-Lake Champlain Valley	St. Lawrence-Lake Champlain Valley	Increasing
	Lower New England Piedmont	Lower New England Piedmont	Increasing
	Great Lakes	Great Lakes	Increasing

Critical Habitats for Species in the Group				
Species	Life Stage or Use	System	SubSystem	Habitat
Indiana bat ( <i>Myotis sodalis</i> )	Breeding	Terrestrial	forested	southern deciduous
	Hibernating/Overwintering	Subterranean	cultural	mines
	Hibernating/Overwintering	Subterranean	natural	terrestrial caves
	Roosting/Congregating	Subterranean	cultural	mines
	Roosting/Congregating	Subterranean	natural	terrestrial caves

**Goal and Objectives for Indiana Bat**

**Goal: Assure the perpetuation of the Indiana bat within the state of New York.**

- Objective 1 :** Within 6 months, develop and implement efficient criteria for reviewing applications for residential developments that will identify the likely loss of Indiana bat maternity colonies and result in a decline in the population
- Measure:** *% of likely habitat vs. unlikely habitat that is included in the review.*
- Objective 2 :** Develop a temperature profile for all New York Indiana bat hibernacula within 5 years . This will include at least three years of data with comparative information from existing and historical roosts and a sample of conditions throughout the site.
- Measure:** *% of sites monitored to the above listed standards*
- Objective 3 :** Conduct complete surveys of all hibernacula with greater than 30,000 bats once every 10 years and 5 selected non-sodalis sites every 5 years.
- Measure:** *% of sites with greater than 30,000 bats that are surveyed.*
- Objective 4 :** Conduct semi-annual winter surveys of hibernating Indiana bats at all Indiana bat hibernacula, with counts of all species as sites with less than 30,000 total individuals.
- Measure:** *% of known hibernacula surveyed*
- Objective 5 :** Regulate access to the six largest Indiana bat hibernacula (Barton Hill, Glen Park, Jamesville Quarry, Williams Complex - Preserve, Hotel and Lake Mines) within 5 years.
- Measure:** *The number of hibernacula that are gated.*
- Objective 6 :** Survey new potential hibernacula as they are discovered.
- Measure:** *% of newly discovered sites that are surveyed*
- Objective 7 :** Within 10 years, determine the likely effects of wind turbines on Indiana bats, including but not limited to, identifying migratory corridors, height of travel above the ground, summer distribution of the species, and kill rates at turbines.
- Measure:** *% of the population that uses likely turbine sites and the % of animals on those sites that are likely to be killed .*
- Objective 8 :** Within 3 years, determine the timing of the spring emergence, fall swarm and fall entry into hibernation of Indiana bats at least one new York hibernacula.
- Measure:** *% of the hibernating population that is monitored at the site.*

**Objective 9 :** Within 5 years develop and implement (if feasible ) hydrogen isotope analysis techniques for use with hair samples to identify the broad scale distribution of maternity colonies.

**Measure:** *Using samples of known origin, compare predicted locations based on isotope analysis with the source location.*

**Objective 10 :** Within 5 years radio track no less than 1% of the reproductive females from each of the 5 largest hibernacula to their summer range to determine summer distribution and habitat preferences.

**Measure:** *% of reproductive females in the hibernacula that are successfully tracked to summer range.*

**Objective 11 :** Within 5 years, determine the relationship between the density of development and the abundance and success of Indiana bat populations.

**Measure:** *The difference in abundance (catch /unit effort, density of detections) between heavily developed, lightly developed and intermediately developed areas of the lower Hudson river valley.*

**Objective 12 :** Within 8 years , design and implement field investigations to determine the consequences of the destruction of maternity colonies on the survival and success of the individual bats from that colony.

**Measure:** *survival rates, reproductive success.*

**Objective 13 :** Within 8 years, determine the likely mark retention rates and the effects on survival resulting from the application of wing bands and Passive Integrated Transponders (PIT ) tags to Indiana bats.

**Measure:** *recapture rates for the various treatment methods.*

**Objective 14 :** Within 8 years, develop an alternative means of monitoring Indiana bat populations other than direct counts at hibernacula.

**Measure:** *unknown*

## Recommended Actions

### Habitat management:

- \* Work with landowners to erect gates to regulate access to the selected hibernacula.

### Habitat monitoring:

- \* Complete three years of roost temperature monitoring at all sodalis sites using continually monitoring temperature probes.
- \* Survey for Indiana bats using vocalization detectors and mist netting at sites that are geographically similar but that have differences in the density of development over large areas.

## Recommended Actions

### Habitat research:

- \* Identify the specific summer habitat requirements for the Indiana bats by radio tracking 1% or more of the hibernating reproductive females from winter to summer range.

### Other action:

- \* Conduct marking studies during the summer maternity, fall swarm and spring emergence that will detect differences in mark retention and survival rates for PIT tags, and at least two types of wing bands.

### Population monitoring:

- \* live trap and mark *sodalis* during the fall swarm, fall entry and spring emergence at one hibernacula to determine the arrival and departure periods of the species by age and sex.
- \* Continue to survey new potential hibernacula as they are discovered.
- \* survey winter populations as indicated in the objectives, develop alternative population monitoring techniques

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**Taxa Group: Mammal**

**Species Group: Marine mammals**

**Threats:**

Threats to cetaceans are primarily human interaction such as; boat strikes, pollution and entanglement in fishing gear. It has been documented that the blue, fin, sei, sperm, right, humpback, and harbor porpoise have all experienced some form of human interaction. Through tools such as; aerial surveys, radio and satellite tagging, genetic analysis we would have the opportunity to obtain more stock data and therefore have the ability to maintain the population at or above its current level.

**Trends:**

There is insufficient data to establish a trend for this species. However, with current technology and methodology we should be able to monitor populations and compare results to present broad scale surveys in the Northwest Atlantic.

**SEQR - No Action Alternative:**

If no action is taken we will not know current abundance and distribution. Without more surveys to better understand habitat usage we can not thoroughly assess movement and population levels. The information obtained through aerial surveys, radio and satellite tagging, and genetic analysis will assist in research on these species in New York marine waters.

**Species in the Group and their Management Status**

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Northern right whale ( <i>Eubalaena glacialis</i> )	E		SNA	G1	E	Migratory
Humpback whale ( <i>Megaptera novaeangliae</i> )	E		SNA	G3	E	Migratory
Blue whale ( <i>Balaenoptera musculus</i> )	E		SNA	G3G4	E	Migratory
Sei whale ( <i>Balaenoptera borealis</i> )	E		SNA	G3	E	Migratory
Fin whale ( <i>Balaenoptera physalus</i> )	E		S1	G3G4	E	Migratory
Harbor porpoise ( <i>Phocoena phocoena</i> )		X	S4	G4G5	U SC	Migratory
Sperm whale ( <i>Physeter catodon</i> )	E		SNA	G3G4	E	Migratory

**Species Distribution - Watershed Basin**

Species	Historical	Current	Stability
Sperm whale ( <i>Physeter catodon</i> )	Atlantic Ocean - NY Bight	Atlantic Ocean - NY Bight	Unknown

<b>Species Distribution - Watershed Basin</b>			
<b>Species</b>	<b>Historical</b>	<b>Current</b>	<b>Stability</b>
Harbor porpoise ( <i>Phocoena phocoena</i> )	Atlantic Ocean - NY Bight	Atlantic Ocean - NY Bight	Unknown
	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Fin whale ( <i>Balaenoptera physalus</i> )	Atlantic Ocean - NY Bight	Atlantic Ocean - NY Bight	Unknown
Sei whale ( <i>Balaenoptera borealis</i> )	Atlantic Ocean - NY Bight	Atlantic Ocean - NY Bight	Unknown
Blue whale ( <i>Balaenoptera musculus</i> )	Atlantic Ocean - NY Bight	Atlantic Ocean - NY Bight	Unknown
Humpback whale ( <i>Megaptera novaeangliae</i> )	Atlantic Ocean - NY Bight	Atlantic Ocean - NY Bight	Unknown
Northern right whale ( <i>Eubalaena glacialis</i> )	Atlantic Ocean - NY Bight	Atlantic Ocean - NY Bight	Unknown

<b>Species Distribution - Ecoregion</b>			
<b>Species</b>	<b>Historical</b>	<b>Current</b>	<b>Stability</b>
Sperm whale ( <i>Physeter catodon</i> )	North Atlantic Coast	North Atlantic Coast	Unknown
Harbor porpoise ( <i>Phocoena phocoena</i> )	North Atlantic Coast	North Atlantic Coast	Unknown
Fin whale ( <i>Balaenoptera physalus</i> )	North Atlantic Coast	North Atlantic Coast	Unknown
Sei whale ( <i>Balaenoptera borealis</i> )	North Atlantic Coast	North Atlantic Coast	Unknown
Blue whale ( <i>Balaenoptera musculus</i> )	North Atlantic Coast	North Atlantic Coast	Unknown
Humpback whale ( <i>Megaptera novaeangliae</i> )	North Atlantic Coast	North Atlantic Coast	Unknown
Northern right whale ( <i>Eubalaena glacialis</i> )	North Atlantic Coast	North Atlantic Coast	Unknown

<b>Critical Habitats for Species in the Group</b>				
<b>Species</b>	<b>Life Stage or Use</b>	<b>System</b>	<b>SubSystem</b>	<b>Habitat</b>

### Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Sperm whale ( <i>Physeter catodon</i> )	Feeding	Marine	deep subtidal	pelagic
Harbor porpoise ( <i>Phocoena phocoena</i> )	Feeding	Marine	deep subtidal	pelagic
Fin whale ( <i>Balaenoptera physalus</i> )	Feeding	Marine	deep subtidal	pelagic
Sei whale ( <i>Balaenoptera borealis</i> )	Feeding	Marine	deep subtidal	pelagic
Blue whale ( <i>Balaenoptera musculus</i> )	Feeding	Marine	deep subtidal	pelagic
Humpback whale ( <i>Megaptera novaeangliae</i> )	Feeding	Marine	deep subtidal	pelagic
Northern right whale ( <i>Eubalaena glacialis</i> )	Feeding	Marine	deep subtidal	pelagic

### Goal and Objectives for Marine mammals

**Goal:** To study abundance and habitat usage.

**Objective 1 :** Obtain baseline data on seasonal variation in abundance and distribution.

**Measure:** *Aerial and shipboard surveys*

**Objective 2 :** Obtain data on habitat selection and usage, along with information on inshore and offshore movements.

**Measure:** *Radio and satellite tag*

**Objective 3 :** Use stranding data to compare work being done on stock structure and provide insight on movements on a broad scale.

**Measure:** *Genetic analysis*

### Recommended Actions

## Recommended Actions

### Curriculum development:

- \* To provide public outreach programs about local species and their environment within the Long Island Sound and the New York Bight. Partnering with agencies such as the New York State Marine Mammal and Sea Turtle Rescue Program, NY DEC, NOAA, U.S. Coast Guard and local law enforcement, will assist the Riverhead Foundation's educational efforts of informing the public about the marine environment and how they can aid in its preservation.

### Fact sheet:

- \* To provide literature for local communities, as well as law enforcement agencies, regarding marine mammals and their environment within the Long Island Sound and the New York Bight. The information distributed by the Riverhead Foundation to these people will provide a more effective response to strandings and sightings of animals.

### Habitat monitoring:

- \* Genetic analysis on stranding data can be compared to work being done on stock structure and provide insight on movements on a broad scale. Thereby revealing the scope of the management initiative required.

### Population monitoring:

- \* Radio and satellite tags can be combined with aerial and shipboard survey work to study abundance, distribution, and movements of habitat as they are coupled with seasonal changes.

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**Taxa Group: Mammal**

**Species Group: Small mammals of uncertain/questionable residency**

**Threats:**

None have been identified. Neither species (least weasel or least shrew) has been reported frequently enough within the state to determine if there are any threats. The least shrew generally inhabits old, fallow, and mixed species hay fields. The continuing loss of these habitat types across the state have undoubtedly decreased the amount of available habitat.

**Trends:**

The least shrew is so rarely encountered in the state (only about a dozen specimens exist) that it is impossible to identify a population trend.

Earliest records for New York include a specimen from West Point, Orange County in 1900 ( USNM No. 254049) and North Rose , Wayne County in October 1913 (USNM No. 197050). More recent records occur from Staten Island, Tompkins county and Long Island. To our knowledge none have been reported in the state since the 1930's. There has not been large scale or wide spread surveys to locate Least shrews in the state since then. The one exception was during the 1950's, when John Whitaker (Indiana state University pers com) set thousands of traps in fields in New York without collecting any. He has subsequently captured over 150 in Indiana. There has not been sufficient effort dedicated to this species to determine its current status.

New York is on the northern fringe of the species distribution and it is not known to be at risk over the majority of its range, although it is rarely encountered in some areas. It is listed as endangered in Connecticut and Pennsylvania. It has apparently diminished substantially in Pennsylvania and is now known from only one location in the south- central portion of the state (Cal Butchkoski, Pennsylvania Game Commission pers. com.).

The least weasel has only been reported on five occasions in New York State , Four were reported taken by trappers in the Pennsylvania border regions of Chautauqua County in the late 1940's, of which one was examined and its identification was confirmed (Cook 1951). Another was collected within a mile of Fredonia, Chautauqua County in 1981. That specimen is currently in the collection of the New York State Museum, Albany. The species is widely distributed, occurring to the south west and north of New York State, although it is sporadically distributed or rarely encountered across much of its range (Svendsen1982).

**SEQR - No Action Alternative:**

Without an understanding of either species' current status and population trends, it is impossible to determine the consequences of no action.

Therefore , we need that basic information.

**Species in the Group and their Management Status**

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Least weasel ( <i>Mustela nivalis</i> )			SH	G5	G	Resident
Least shrew ( <i>Cryptotis parva</i> )		X	SH	G5	U	Resident

Species Distribution - Watershed Basin			
Species	Historical	Current	Stability
Least shrew (Cryptotis parva)	SW Lake Ontario	Unknown	Unknown
	Susquehanna		
	Allegheny		
	Delaware		
	SE Lake Ontario		
	Lower Hudson - Long Island Bays		
	Lake Erie		
Least weasel (Mustela nivalis)	Allegheny	Unknown	Unknown
	Lake Erie		

Species Distribution - Ecoregion			
Species	Historical	Current	Stability
Least shrew (Cryptotis parva)	North Atlantic Coast	Unknown	Unknown
	Western Allegheny Plateau		
	Great Lakes		
Least weasel (Mustela nivalis)	Western Allegheny Plateau	Unknown	Unknown

Critical Habitats for Species in the Group				
Species	Life Stage or Use	System	SubSystem	Habitat
Least shrew (Cryptotis parva)	all	Terrestrial	open upland	grasslands
Least weasel (Mustela nivalis)	all	Terrestrial	forested	southern deciduous
	all	Terrestrial	open upland	



## Goal and Objectives for Small mammals of uncertain/questionable residency

**Goal:** To insure the perpetuation of the least shrew and least weasel in New York state if populations exist here.

**Objective 1 :** within 6 years determine the current distribution and status of the least shrew

**Measure:** *Captures per unit of effort in suitable habitat within the species historic range.*

**Objective 2 :** Within 6 years determine the current status and distribution of the least weasel in NY

**Measure:** *Captures per unit of effort in suitable habitat within the species historic range.*

## Recommended Actions

### Population monitoring:

- \* if the species is found within the historic range, extend surveys to likely habitat outside of the known historic range
- \* Conduct trapping efforts for both species in likely habitats within their known historic distribution in the state.

## References

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### Originator

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**Taxa Group: Mammal**

**Species Group: Small-Footed Bat**

**Threats:**

Little is known about the true status of this species and too little is known to suggest threats. Our interest is in confirming our suspicion that the species is more common than it currently appears and indeed is facing no threats.

**Trends:**

Based on winter records, the species is rare in New York but the population appears to be stable (DEC files). Other states within the range that express concern about the species, base their concerns on the lack of animals found in hibernacula. Winter surveys suggest that this is the rarest of the cave bats in New York and probably the eastern US, with roughly 4,000 having been detected range wide. Nearly 3,000 have been counted in New York, almost all in just two sites (DEC files). Summer records, particularly in the south, suggest that the species is far more common than winter records would imply (Craig Stihler, West Virginia Department of Natural Resources pers com). This view is supported by the hardy nature of the bat as a hibernator (Barbour and Davis 1969), which probably allows it to winter in relatively unprotected sites in southern areas. It also has a habit of roosting in crevices and under rocks (Martin et al 1966), which would make most individuals hidden from the view of surveyors.

**SEQR - No Action Alternative:**

Conducting the appropriate surveys will likely allow us to confirm the species true status in the state. It will likely remove this species from Department concern and allow us to focus on other species in greater need. A lack of action will prevent us from doing so.

Species in the Group and their Management Status						
Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Small-footed bat ( <i>Myotis leibii</i> )						Resident

Species Distribution - Watershed Basin			
Species	Historical	Current	Stability
Small-footed bat ( <i>Myotis leibii</i> )	Lake Champlain	Lake Champlain	Unknown

Species Distribution - Ecoregion			
Species	Historical	Current	Stability
Small-footed bat ( <i>Myotis leibii</i> )	St. Lawrence-Lake Champlain Valley	St. Lawrence-Lake Champlain Valley	Unknown

### Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Small-footed bat (Myotis leibii)	Feeding	Terrestrial	open upland	cliffs & open talus

### Goal and Objectives for Small-Footed Bat

**Goal:** Insure the perpetuation of the small-footed bat

**Objective 1 :** Monitor populations at selected hibernacula at no greater than 10 year intervals

**Measure:** *% of occupied sites that are surveyed*

**Objective 2 :** Determine the percentage of the wintering population of small-footed bats that is available for counting by surveyors.

**Measure:** *% of transmitter bats that are roosting in various roost types within the hibernacula.*

**Objective 3 :** Determine the summer distribution and habitat preferences of reproductive females within the state .

**Measure:** *Distribution and habitat characteristics of recovered transmitter animals*

### Recommended Actions

**Life history research:**

- \* radio tag , release and track 20 reproductive female M. leibii as they exit the hibernacula and track them to their summer range.
- \* radio tag and release 20 leibii as they enter the largest hibernacula for the winter. Relocate them within the mine to determine their roost selection.

**Population monitoring:**

- \* continue to survey hibernating leibii in conjunction with sodalis hibernacula surveys

### References

Barbour, R.W. and W.H. Davis. 1967. Bats of America. University Press of Kentucky. Pgs 103-105

Martin R.L., J.T. Pawluk, and T.B. Clancy . 1966. Observations on hibernation of Myotis subulatus. J. mamm. 47:348-49

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**Taxa Group: Mammal**  
**Species Group: Tree bats**

**Threats:**

Unknown at this time. Tree bats do migrate seasonally over long distances and seem to be more susceptible to collisions with towers and wind turbines than other species. It is uncertain if this might adversely affect their populations.

**Trends:**

There has never been a systematic survey of any of these species in the state of New York. Most work that has been recently conducted (mist netting) has been limited in extent and would tend to underestimate the abundance of these species, especially hoary and silver-haired. What historical evinces there is suggests that the silver-haired was the most common bat in the Adirondacks during the 1880's, more common than all others combined (Merriam 1884). Outside of the Adirondacks the silver-haired was rarely encountered, but was more common during migration. The hoary bat was uncommon, less so in the Adirondacks. Red bats appear to be more common than the other tree species, especially in warmer regions of the state. (Merriam 1884, Miller 1899, Dekay 1842)

Most work that has been recently conducted in New York has been limited to mist netting at just a few sites. This method would tend to underestimate the abundance of these species as they generally fly above net heights, especially the hoary and silver-haired. Surveys by DEC in the last few years at some of Merriam's primary collecting locations revealed no evidence of the silver-haired bats, suggesting that it has undergone a severe decline over the last century. We know of only four summer records of silver-haired bats in the state in recent decades. The hoary appears to be widely distributed but in low numbers. The red bat does not appear to be common but is more frequently encountered than the other two, especially in warmer portions of the state (DEC files).

Regionally, the status (or lack of information) of these bats is similar to that in New York except that the red bat is clearly more common to the south (Scott Darling, Vermont Fish and wildlife pers com, Cal Butchkoski Pennsylvania Game Commission pers com, Jenny Dickson Connecticut Fish and Wildlife pers com). The silver haired bat appears to be more common to the west and is one of the most common bats in the prairie parklands (vanZell de Jong 1985)

**SEQR - No Action Alternative:**

Species in the Group and their Management Status						
Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Silver-haired bat ( <i>Lasionycteris noctivagans</i> )		X	S4B	G5	U	Resident
Hoary bat ( <i>Lasiurus cinereus</i> )		X	S4B	G5	U	Resident
Eastern red bat ( <i>Lasiurus borealis</i> )		X	S5B	G5	U	Resident

<b>Species Distribution - Watershed Basin</b>			
<b>Species</b>	<b>Historical</b>	<b>Current</b>	<b>Stability</b>
Eastern red bat ( <i>Lasiurus borealis</i> )	Upper Hudson	Upper Hudson	Unknown
	SW Lake Ontario	SW Lake Ontario	Unknown
	Susquehanna	Susquehanna	Unknown
	SE Lake Ontario	SE Lake Ontario	Unknown
	NE Lake Ontario - St. Lawrence	NE Lake Ontario - St. Lawrence	Unknown
	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	Lake Erie	Lake Erie	Unknown
	Lake Champlain	Lake Champlain	Unknown
	Delaware	Delaware	Unknown
	Allegheny	Allegheny	Unknown
Hoary bat ( <i>Lasiurus cinereus</i> )	Upper Hudson	Allegheny	Unknown
	SW Lake Ontario	Delaware	Unknown
	Susquehanna	Lake Champlain	Unknown
	SE Lake Ontario	Upper Hudson	Unknown
	NE Lake Ontario - St. Lawrence	SW Lake Ontario	Unknown
	Lake Erie	Susquehanna	Unknown
	Lower Hudson - Long Island Bays	SE Lake Ontario	Unknown
	Lake Champlain	NE Lake Ontario - St. Lawrence	Unknown
	Delaware	Lower Hudson - Long Island Bays	Unknown
	Allegheny	Lake Erie	Unknown

<b>Species Distribution - Watershed Basin</b>			
<b>Species</b>	<b>Historical</b>	<b>Current</b>	<b>Stability</b>
Silver-haired bat ( <i>Lasionycteris noctivagans</i> )	Upper Hudson	Upper Hudson	Unknown
	SW Lake Ontario	SW Lake Ontario	Unknown
	Susquehanna	Susquehanna	Unknown
	SE Lake Ontario		
	NE Lake Ontario - St. Lawrence		
	Lower Hudson - Long Island Bays		
	Lake Erie		
	Lake Champlain		
	Delaware		
	Allegheny		

<b>Species Distribution - Ecoregion</b>			
<b>Species</b>	<b>Historical</b>	<b>Current</b>	<b>Stability</b>
Eastern red bat ( <i>Lasiurus borealis</i> )	Great Lakes	Great Lakes	Unknown
	High Allegheny Plateau	High Allegheny Plateau	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
	North Atlantic Coast	North Atlantic Coast	Unknown
	St. Lawrence-Lake Champlain Valley	St. Lawrence-Lake Champlain Valley	Unknown



Species Distribution - Ecoregion			
Species	Historical	Current	Stability
Hoary bat ( <i>Lasiurus cinereus</i> )	Great Lakes	Western Allegheny Plateau	Unknown
	Western Allegheny Plateau	St. Lawrence-Lake Champlain Valley	Unknown
	St. Lawrence-Lake Champlain Valley	Northern Appalachian/Boreal Forest	Unknown
	Northern Appalachian/Boreal Forest	North Atlantic Coast	Unknown
	North Atlantic Coast	High Allegheny Plateau	Unknown
	Lower New England Piedmont	High Allegheny Plateau	Unknown
	High Allegheny Plateau	Great Lakes	Unknown
Silver-haired bat ( <i>Lasionycteris noctivagans</i> )	Western Allegheny Plateau	Western Allegheny Plateau	Unknown
	Great Lakes	St. Lawrence-Lake Champlain Valley	Unknown
	High Allegheny Plateau	Northern Appalachian/Boreal Forest	Unknown
	Lower New England Piedmont	North Atlantic Coast	Unknown
	North Atlantic Coast	Lower New England Piedmont	Unknown
	Northern Appalachian/Boreal Forest	High Allegheny Plateau	Unknown
	St. Lawrence-Lake Champlain Valley	Great Lakes	Unknown

Critical Habitats for Species in the Group				
Species	Life Stage or Use	System	SubSystem	Habitat
Eastern red bat ( <i>Lasiurus borealis</i> )	all	Terrestrial	forested	mixed deciduous/coniferous
	all	Terrestrial	forested	northern deciduous
	all	Terrestrial	forested	southern deciduous
Hoary bat ( <i>Lasiurus cinereus</i> )	all	Terrestrial	forested	mixed deciduous/coniferous
	all	Terrestrial	forested	northern deciduous
	all	Terrestrial	forested	southern deciduous
Silver-haired bat ( <i>Lasionycteris noctivagans</i> )	all	Terrestrial	forested	northern deciduous

**Critical Habitats for Species in the Group**

Species	Life Stage or Use	System	SubSystem	Habitat
Silver-haired bat ( <i>Lasionycteris noctivagans</i> )	all	Terrestrial	forested	southern coniferous
	all	Terrestrial	forested	southern deciduous

**Goal and Objectives for Tree bats**

**Goal:** Insure the perpetuation of the tree bats as resident species in the state of New York

**Objective 1 :** Determine migratory patterns for tree bats through NY state

**Measure:** *unknown*

**Objective 2 :** Determine the level of threat posed to tree bats by wind turbines and other tall structures.

**Measure:** *Mortality rates for animals passing structures, percent of the population likely to be affected. Overall effect on the population.*

**Objective 3 :** Develop and implement a methodology to identify the origin (resident or migrant) of individual tree bats so as to distinguish between residents and migrants among captured animals and recovered mortalities.

**Measure:** *% of animals of known origin that are correctly identified.*

**Objective 4 :** within 8 years determine the current summer status and distribution of each species in NY state.

**Measure:** *% of habitats within the states ecozones that have been adequately sampled.*

**Recommended Actions**

**Other action:**

- \* review and respond to projects involving tall structures that are likely to adversely effect the population.

**Statewide baseline survey:**

- \* Conduct surveys of migrants to determine the timing, distribution, species composition and elevation of migrating bats. This is likely to include combinations of acoustical monitoring , radar, and visual monitoring.
- \* conduct summer surveys of tree bats that will include capturing individuals and acoustical monitoring

## References

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- Dekay James.1842. 1842. Natural History of NY Part 1: Zoology, class 1 :mammals 142 pp.
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