Species Status Assessment

Class: Birds
Family: Laniidae
Scientific Name: *Lanius ludovicianus*
Common Name: Loggerhead shrike

Species synopsis:

The loggerhead shrike is a bird of open landscapes, roadsides, golf courses, riparian areas, steppes, deserts, savannahs, prairies, and occasionally, suburban areas. It is most abundant in the southern half of the United States. Across its range, the population is estimated to have declined by 72% since 1967. Declines have been most significant in the Northeast.

In New York, loggerhead shrike historically bred on the Great Lakes Plain, St. Lawrence Plain, and the Champlain Valley. Spahn (1988) referred to loggerhead shrike as, "perhaps the most seriously declining species in New York" and the second Breeding Bird Atlas (2000-05) documented the extirpation of the species as a breeder in the state, marking the end of a long decline that began in the 1930s and 1940s (Novak 2008). Loggerhead shrike is now extirpated as a breeder in all northeastern states. Remaining populations in Ontario and Quebec are declining.

I. Status

a. Current and Legal Protected Status

i. Federal Not Listed **Candidate?** No

ii. New York Endangered; SGCN

b. Natural Heritage Program Rank

i. Global G4

ii. New York S1B **Tracked by NYNHP?** Yes

Other Rank:

Loggerhead shrike was listed as a Nongame Migratory Bird of Management Concern by the U.S. Fish and Wildlife Service in 1982 and 1987. It is listed as Endangered in New Hampshire, Vermont, Massachusetts, New York, Pennsylvania, Maryland, and Virginia.
Species of Northeast Regional Conservation Concern (Therres 1999)

Status Discussion:

The loggerhead shrike is now extirpated as a breeder in New York. It is a rare migrant—primarily in spring—and an occasional summer visitant. Individuals occur less than annually.

II. Abundance and Distribution Trends

a. North America

i. Abundance

__X__ **declining** ____**increasing** ____**stable** ____**unknown**

ii. Distribution:

__X__ **declining** ____**increasing** ____**stable** ____**unknown**

Time frame considered: _____2000-2010_____

b. Regional

i. Abundance

__X__ **declining** ____**increasing** ____**stable** ____**unknown**

ii. Distribution:

__X__ **declining** ____**increasing** ____**stable** ____**unknown**

Regional Unit Considered: _____Eastern BBS_____
Time Frame Considered: _____2000-2010_____

c. Adjacent States and Provinces

CONNECTICUT **Not Present** ___X___ **No data** _____

i. Abundance

____ declining ____increasing ____stable ____ unknown

ii. Distribution:

____ declining ____increasing ____stable ____ unknown

Time frame considered: _____
Listing Status: _____Extirpated_____ SGCN? ___No_____

MASSACHUSETTS **Not Present** ___X____ **No data** _____

i. Abundance

____ declining ____increasing ____stable ____unknown

ii. Distribution:

____ declining ____increasing ____stable ____unknown

Time frame considered: _____
Listing Status: _____Extirpated_____ SGCN? ___No___

NEW JERSEY **Not Present** _____ **No data** _____

i. Abundance

____ declining ____increasing ____stable __X__ unknown

ii. Distribution:

____ declining ____increasing ____stable __X__ unknown

Time frame considered: _____
Listing Status: _____Endangered_____ SGCN? ___Yes_____

ONTARIO **Not Present _____** **No data _____**

i. Abundance

__X__ **declining** **____increasing** **____stable** **____unknown**

ii. Distribution:

__X__ **declining** **____increasing** **____stable** **____unknown**

Time frame considered: ____1981-85 to 2001-05_____
Listing Status: _____Endangered_____

PENNSYLVANIA **Not Present _____** **No data _____**

i. Abundance

__X__ **declining** **____increasing** **____stable** **____unknown**

ii. Distribution:

__X__ **declining** **____increasing** **____stable** **____unknown**

Time frame considered: ___1984-89 to 2004-08_____
Listing Status: _____Endangered_____ SGCN? __Yes___

QUEBEC **Not Present _____** **No data _____**

i. Abundance

__X__ **declining** **____increasing** **____stable** **____unknown**

ii. Distribution:

__X__ **declining** **____increasing** **____stable** **____unknown**

Time frame considered: ___1984-89 to 2012_____
Listing Status: _____Endangered_____

VERMONT **Not Present** __X____ **No data** _____

i. **Abundance**

____ declining ____increasing ____stable ____ unknown

ii. **Distribution:**

____ declining ____increasing ____stable ____ unknown

Time frame considered: ___1976-81 to 2003-07_____
Listing Status: _____Extirpated_____ SGCN? __No____

d. NEW YORK **No data** _____

i. **Abundance**

__X__ **declining ____increasing ____stable ____unknown**

ii. **Distribution:**

__X__ **declining ____increasing ____stable ____unknown**

Time frame considered: ____1980-85 to 2000-05_____
*Extirpated as a breeder

Monitoring in New York.

None.

Trends Discussion:

Declines were observed in the United States breeding population beginning in the late 1960s and continuing to the present. Declines were also observed on the wintering areas of shrikes from the late 1950s. The Breeding Bird Survey detected a significant annual decline of 3.4% per year in the Eastern region from 2000 to 2010 (Sauer et al. 2011). Numbers of wintering shrikes detected on Christmas Bird Counts in the Northeast significantly declined survey-wide from 1959 to 1988 (Sauer et al. 1996). In the Northeast, loggerhead shrikes now breed only in Quebec and Ontario.

New York's second Breeding Bird Atlas (2000-05) documented the extirpation of loggerhead shrike from New York since the early 1980s. The first Atlas (1980-85) reported ten confirmed records and showed occupancy in a total of 24 survey blocks in the Great Lakes Plain, St. Lawrence Plains, and Champlain Valley. Loggerhead shrike was not found during the second Atlas in any of those blocks. Only four survey blocks had records, all of which were only of possible breeding.

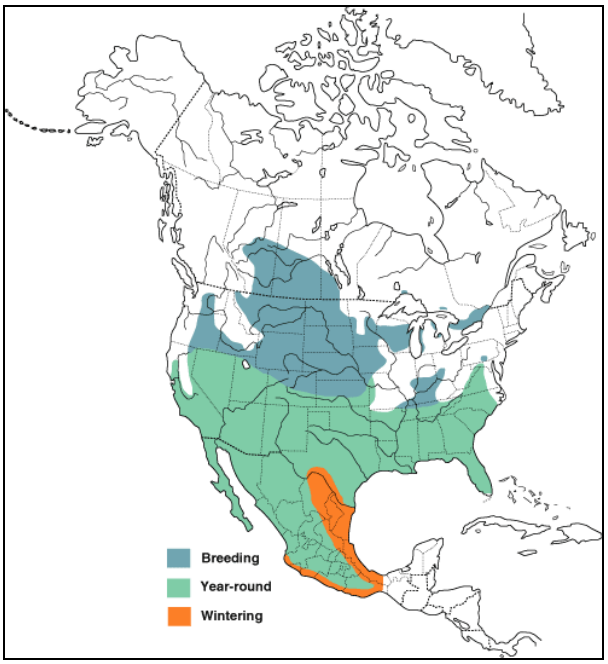

Figure 1. Range of the loggerhead shrike in North America (Birds of North America Online 2013).

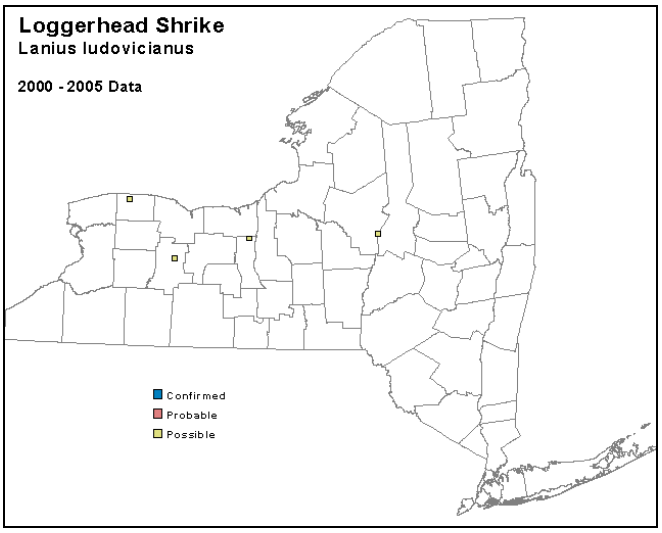

Figure 2. Loggerhead shrike occurrence in New York State during the second Breeding Bird Atlas (McGowan and Corwin 2008).

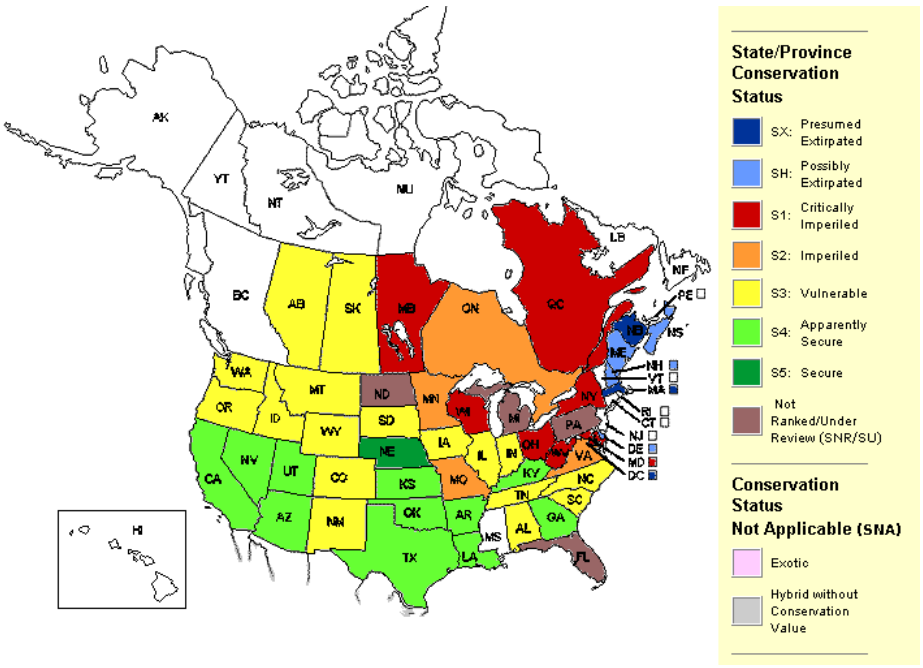

Figure 3. Conservation status of the loggerhead shrike in North America (NatureServe 2012).

III. New York Rarity, if known:

Historic	# of Animals	# of Locations	% of State
prior to 1970	_____	168 records	_____
prior to 1980	_____	_____	_____
prior to 1990	_____	24 blocks	<1

Details of historic occurrence:

Novak (1989) gathered historic breeding data for loggerhead shrike in New York from 1869 to 1985, listing 168 confirmed breeding records and 186 probable breeding records. The first Breeding Bird Atlas (1980-85) documented occupancy in 24 survey blocks statewide (<1%). Of these, ten blocks had Confirmed breeding (though three adjacent blocks are thought to represent one breeding event) and three had Probable breeding.

Current	# of Animals	# of Locations	% of State
	_____	4 blocks	<1

Details of current occurrence:

The second Breeding Bird Atlas (2000-05) documented Possible records in only four survey blocks statewide. No Confirmed or Probable records were reported. The species is considered to be extirpated as a breeder.

New York's Contribution to Species North American Range:

Distribution (percent of NY where species occurs)

- X 0-5%
- ___ 6-10%
- ___ 11-25%
- ___ 26-50%
- ___ >50%

Abundance (within NY distribution)

- ___ abundant
- ___ common
- ___ fairly common
- ___ uncommon
- X rare

NY's Contribution to North American range

- X 0-5%
- ___ 6-10%
- ___ 11-25%

___ 26-50%

___ >50%

Classification of New York Range

____ Core

__X__ **Peripheral**

__X__ **Disjunct**

Distance to core population:

__<100 mi to Ontario pop___

IV. Primary Habitat or Community Type:

1. Pasture/Hay

2. Native Barrens and Savanna

3. Old Field Managed Grasslands

4. Cultivated Crops

Habitat or Community Type Trend in New York:

__X__ **Declining** **____Stable** **____ Increasing** **____Unknown**

Time frame of decline/increase: ____Since 1950s_____

Habitat Specialist? __X__ **Yes** _____ **No**

Indicator Species? _____ **Yes** __X__ **No**

Habitat Discussion:

Novak (1989) documented habitat use in New York. Pasture with less than 20% cover of woody vegetation and saplings at densities of three to forty-one plants per hectare was a preferred breeding habitat. Nests were more frequently placed in single trees (or shrubs) or clumps of trees rather than a continuous line of trees such as a hedgerow or wind break. Hawthorn was the most commonly-used nest tree, but this may reflect the availability of this species rather than the shrike's preference for it.

According to Spahn (1988), loggerhead shrikes in New York are found in open fields and scrubby clearings with thickets and hedgerows having hawthorn and apple among the tree species. Its habitat must contain trees or shrubs with thorns or a multitude of small crotches, to accommodate the feeding mechanism of impaling or wedging larger prey items.

In general, loggerhead shrikes live in a variety of semi-open habitats that are dominated by short vegetation. Those native to Illinois, New York, and Maryland frequent pastures, while those endemic to western states prefer sagebrush, desert scrub, and pinyon-juniper woodlands with small shrubby trees. Residential areas with suitable perches often have a number of loggerhead shrikes occupying them, and the birds have been recorded in mountainous areas up to 6,600 feet (2,000 meters) as well (Yosef 1996).

V. New York Species Demographics and Life History

__X__ **Breeder in New York** (*Extirpated as breeder*)

__X__ **Summer Resident**

____ **Winter Resident**

____ **Anadromous**

____ **Non-breeder in New York**

____ **Summer Resident**

____ **Winter Resident**

____ **Catadromous**

__X__ **Migratory only** (*currently migrant*)

____**Unknown**

Species Demographics and Life History Discussion:

Loggerhead shrikes generally breed at a year old, during their first spring after hatching (Miller 1931, Collister 1994). A hatching success (% eggs laid that hatch) rate of >80% appears to be normal. Large clutch size and relatively high rate of hatching success potentially enable loggerhead shrikes to produce large numbers of offspring, although many young are lost through brood reduction and predation. Observations of food-begging young suggest that those that beg most aggressively are fed most frequently, a situation that can lead to malnourishment and death of the youngest, weakest fledgling, particularly when food is scarce.

In New York, Novak (1989) calculated the mean number of fledglings/successful was 3.5 (n = 5 nests) and the mean number reaching independence at four weeks post-fledging was 2.75 (Yosef 1996).

No systematic study of life span and survivorship had been attempted, and estimates of survivorship (e.g., Miller 1931, Kridelbaugh 1983, Brooks 1988) are confounded by undetermined levels of dispersal between breeding seasons. Mortality during the period from fledging through independence is apparently severe, resulting primarily from exposure. Other causes of mortality include predation associated with use of roadside habitats, which facilitate access by feral cats, and competition with other species that benefit from human-induced changes including European starling and American kestrel. Vehicle strikes are high (see Threats). Overall survival rate to the age of dispersal for juvenile shrikes released over two breeding seasons and monitored by radio-telemetry as part of a captive rearing and release program in Ontario was 75.7% (29 of 38) and cause of death for five birds where cause could be identified was avian predation (Imlay et al. 2010).

VI. Threats:

Severe habitat loss (Cade and Woods 1997) and pesticide contamination (Anderson and Duzan 1978) was detrimental to nesting loggerhead shrikes in the northeastern United States beginning in the 1960s. When mechanized agriculture began to expand large monocultures of agriculture operations, high quality shrike habitat was diminished. Many open areas were also lost to development or matured into forests. The heavy use of pesticides, particularly DDT, accumulated in the prey of shrikes and resulted in eggshell thinning, reproductive failure, and contamination of adults and young (Anderson and Duzan 1978). Apple orchards, a formerly favored habitat in New York, are heavily sprayed with pesticides.

The role of contaminants in the decline of this species remains unclear because concentrations required to reduce populations are unknown; loggerhead shrike decline, however, coincides with introduction and increased use of organochlorines in 1940s–1970s. Results imply that loggerhead shrikes may obtain pesticide contamination in wintering areas (Anderson and Duzan 1978) owing to ingestion of prey taken in sprayed areas (Korschgen 1970).

According to Yosef (1996), in many areas, hedgerows, barbed-wire fences, and other habitat features favored by loggerhead shrikes are concentrated along roadways (DeGeus 1990); as a result, fledglings, juveniles, and even adults are frequently killed by automobiles (Robertson 1930, Miller 1931, Luukkonen 1987, Gawlik 1988, Novak 1989).

This shrike typically flies low to the ground, sometimes across roadways; automobiles accounted for 29% of the observed fall and winter mortality among loggerhead shrikes in Virginia, second only to predation (n = 9; Blumton 1989). Exponential increase in roads and vehicular traffic since 1940s could be a major factor in population declines (Flickinger 1995). The areas in Ontario where shrikes

have persisted are rural areas without extensive, heavily traveled roads, and also provide a greater amount of pasture habitat that is less fragmented (P. Novak pers. comm.).

Studies in Ontario indicate that captive-reared juvenile shrikes exhibit typical early migration behavior and movements and do not experience high mortality as they move through heavily populated southern Ontario. Breeding habitat in Ontario is not considered a limiting factor and does not appear to limiting during the juvenile dispersal period (Imlay et al. 2010). These and other recent studies provide support for the idea that suitable habitat on the migration route and wintering grounds, where migratory shrikes may also share habitat with resident birds, may be limiting breeding populations (P. Novak, pers. comm.).

Land-use changes are traditionally believed to be most important in affecting overall grassland bird abundance on regional and continental scales. From 1940 to 1986 in 18 northeastern states, the area in hay fields declined from 12.6 to 7.1 million ha. During the same period, hay fields planted to alfalfa and alfalfa mixtures, a vegetation type not normally used by many species of grassland birds, increased from 20 to 60% (Bollinger and Gavin 1992). Also, hay fields now are cut 2–3 weeks earlier than they were in 1940s and 1950s, with mowing coinciding with the peak nesting period.

Declines in some areas have been attributed to decrease in hayfield area, earlier and more frequent hay-cropping, and shift from timothy and clover to alfalfa; earlier, agricultural practices that converted wooded land to open land resulted in an increase in range (Bollinger et al. 1990, Bollinger and Gavin 1992). In New York, primary disturbance to nesting is hay-cropping; 100% of nests with eggs and young nestlings affected by mowing were abandoned or destroyed, but proportion of young lost declined with age of nestlings (Bollinger et al. 1990).

Since the mid-1940s, the eastward expansion has reversed in northeastern U.S. and southern Ontario as agricultural lands have been abandoned, reverting to deciduous forest (Robbins et al. 1986, Hussell 1987). Sibley (1988) noted that declines had resulted from the replacement of grain crops by corn and alfalfa, despite the use of corn fields for breeding noted by other authors.

A study led by a Canadian toxicologist identified acutely toxic pesticides as the most likely leading cause of the widespread decline in grassland bird numbers in the United States. The 23-year assessment, which looked at five other causes of grassland bird decline besides lethal pesticide risk, including change in cropped pasture such as hay or alfalfa production, farming intensity or the proportion of agricultural land that is actively cropped, herbicide use, overall insecticide use, and change in permanent pasture and rangeland, concluded that lethal pesticides were nearly four times more likely to be associated with population declines than the next most likely contributor, changes in cropped pasture (Mineau and Whiteside 2013).

Are there regulatory mechanisms that protect the species or its habitat in New York?

_____ No **____ Unknown**

_X__ Yes

The loggerhead shrike is listed as an endangered species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species.

Loggerhead shrike is protected under the Migratory Bird Treaty Act of 1918.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

A captive breeding program in Ontario, where the last remaining breeding population in the Northeast exists, has shown some success. A growing population of loggerhead shrike could potentially expand into available habitat in New York, though the availability of suitable pasture habitat away from roads is questionable. The Ontario program also involves land protection efforts, which would be necessary in New York as well. The Landowner Incentive Program encourages cooperative agreements to support local farmland protection. Habitat enhancement might include grazing, hedgerow or shrub planting, and in some cases removal of too dense shrubs on some St. Lawrence Valley state lands (P. Novak, pers. comm.).

The publication, *A Plan for Conserving Grassland Birds in New York* (Morgan and Burger 2008), identifies focus areas for coordinating grassland bird conservation efforts. Because grassland birds are sensitive to landscape-level factors and funding for conservation activities is limited, the best opportunity for achieving success is to concentrate efforts within regions of the state that support key residual populations of grassland birds. Suitable landcover classification datasets are needed to incorporate habitat availability into the delineation process.

Because the vast majority of remaining grassland habitat is privately owned, private lands incentive programs and educational programs should be a major component of the conservation effort. Protection of existing habitat for threatened and endangered species through enforcement of regulations pertaining to the taking of habitat is also a critical component of the conservation effort for these species (Morgan and Burger 2008).

Morgan and Burger (2008) recommend that further research is needed:

1. Methods and data for modeling distributions and abundance of grassland landcover across the landscape.

2. Impacts of management on productivity of grassland birds, to amplify existing information on grassland bird abundances associated with management.

3. Potential benefits of native grass species as grassland habitat in contrast with demonstrated benefit of non-native cool season grasses.

Conservation actions following IUCN taxonomy are categorized in the table below.

Conservation Actions	
Action Category	**Action**
Land/Water Protection	Resource/Habitat Protection
Land/Water Management	Invasive/Problematic Species Control
Land/Water Management	Habitat and Natural Process Restoration
Education and Awareness	Awareness & Communications
External Capacity Building	Alliance & Partnership Development

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for loggerhead shrike.

Captive breeding:

____ Research/learn the techniques employed in Ontario in their captive breeding efforts and either support those efforts in exchange for release of birds in New York or develop a similar program in New York. Work cooperatively with the Eastern Loggerhead Shrike Recovery Team in Canada on this process.

Easement acquisition:

____ Cooperative agreements or easements may be required or desirable in areas that may be suitable for a release effort.

Fact sheet:

____ Prior to any release of birds a fact sheet and landowner educational effort similar to that employed in Ontario should be developed to develop support or acceptance among the local landowners as most shrikes would occur on private lands.

Habitat management:

____ Determine whether specific habitat management such as planting of hedgerows, removal of shrubs in pastures, or former pastures, where they have become too dense, etc. may be desirable or necessary in some areas prior to any release efforts.

Habitat research:

____ Examine habitat data on the three core breeding areas in Ontario and evaluate several areas in New York for similar characteristics. Habitat data should include acreage in various cover types and road density information. Work cooperatively with the Eastern Loggerhead Shrike Recovery Team in Canada on this process.

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