

## SPECIES PROFILE

# Nelson's Sharp Tailed Sparrow

*Ammodramus nelsoni*

**Federal Listing:** Not listed

**State Listing:** Special Concern

**Global Rank:** G5

**State Rank:** S3B

**Authors:** Megan J. McElroy and Kimberly J. Babbitt, University of New Hampshire

## ELEMENT 1: DISTRIBUTION AND HABITAT

### 1.1 Habitat Description

In New Hampshire, Nelson's sharp-tailed sparrows (hereafter, Nelson's sparrow) inhabit salt marshes, which are grass-dominated tidal wetlands existing in the transition zone between ocean and upland (Niering and Warren 1980) (see Salt Marshes habitat profile). They breed in marshes where smooth cordgrass, saltmeadow grass, and blackgrass are bordered by cattail, reed, and marsh elder (Greenlaw and Rising 1994). Sparrows forage on the ground in dense, wet grasses (e.g., cordgrass, blackgrass), areas of wrack, and edges of ditches, pools, and salt pannes (Greenlaw and Rising 1994). Their diet consists mainly of adult and larval insects, spiders, and amphipods. Grass seeds and herbaceous plants become an important part of their diet during fall migration (Greenlaw and Rising 1994).

### 1.2 Justification

Nelson's sharp-tailed sparrow has been designated a species of high conservation priority (Breeding Tier I) by Partners in Flight. In New Hampshire, Nelson's sparrow is a species of special concern. Few data exist on population trends, estimates, and threats in the state, and a long-term study of this species in New Hampshire has not been conducted. Ongoing and historical habitat loss and degradation are probably the most pressing threats to Nelson's sparrow popula-

tions in the Northeast. Protecting breeding habitat and Nelson's sparrow populations in New Hampshire is important to regional survival of this species.

High-quality salt marsh habitat available in large patches across a landscape is required for a population's persistence and growth. Degradation and loss of salt marsh habitat caused by tidal restrictions have resulted in the replacement of typical salt marsh vegetation with invasive reeds and grasses, such as cattails and common reed (Sinicrope et al. 1990, Burdick et al. 1997, Brawley et al. 1998). Areas of invasive plants in and around salt marshes decrease available habitat for breeding Nelson's sparrows because they are not suitable habitat.

The current lack of knowledge regarding Nelson's sparrow populations in New Hampshire and threats to these populations is similar to that for other closely related salt marsh birds, such as salt marsh sharp-tailed sparrow and seaside sparrow. With further research and monitoring, this salt marsh guild may serve as an indicator of marsh health, the effects of marsh degradation, and the success of management practices.

### 1.3 Protection and Regulatory Status

- The Migratory Bird Treaty Act of 1918 legally protects Nelson's sparrows from the take, transport, and use of the species, including eggs, nests, and feathers.
- NHDES regulates human impacts on salt marshes. Any activity that may involve filling, dredging, or destroying wetlands is subject to strict guidelines and requires approved permits before work can commence (RSA-A).

### 1.4 Population and Habitat Distribution

Nelson's sparrow is a northern species that breeds in the Gulf of Maine and Nova Scotia west to Alberta

(Sibley 1996), and much of its breeding populations occur in the Northeast (Hodgman et al. 2002). New Hampshire is the southern periphery of the breeding range, yet they do breed in salt marshes in southeastern New Hampshire (Gavutis 1994, NHBR, McElroy and Babbitt, unpublished data). Any of these marshes can be used as migratory habitat for Nelson's sparrows; however, the largest breeding population occurs at sites around Great Bay (NHBR, McElroy and Babbitt, unpublished data).

### 1.5 Town Distribution Map

*Not completed for this species.*

### 1.6 Habitat Map

### 1.7 Sources of Information

A literature review was conducted on Nelson's sparrows to obtain habitat, population distribution, and status data. NHA database of Bird Records was used for historical information on the distribution of Nelson's sparrows. Detailed information on current population distribution and status was obtained from data collected in 2004 by researchers from UNH.

### 1.8 Extent and Quality of Data

Historical bird records from NHA include sightings reported by birders. Although this information is vital to knowledge of historical distribution, it does not give an accurate account of population size or confirmed breeding locations throughout the state. In addition, the American Ornithologists' Union Committee in 1995 redefined the sharp-tailed sparrow (*Ammodramus caudacutus*) into two separate species: Nelson's sharp-tailed sparrow and saltmarsh sharp-tailed sparrow (*Ammodramus caudacutus*). Therefore, historical records prior to the split do not distinguish these 2 species. The most extensive dataset comes from UNH researchers. It includes confirmed breeding locations and population estimates throughout the state for the breeding season in 2004. Significant gaps exist in knowledge of breeding populations and long-term trends in abundance throughout the state.

### 1.9 Distribution Research

A long-term survey of salt marsh habitat (i.e., point

counts conducted during breeding season at established points) is needed to determine the distribution of Nelson's sparrow in New Hampshire. It is essential that this effort be long-term because the quality of salt marsh habitat changes over time, potentially affecting Nelson's sparrow populations from one breeding season to the next.

## ELEMENT 2: SPECIES/HABITAT CONDITION

### 2.1 Scale

The New Hampshire conservation unit for Nelson's sparrow is Great Bay and Portsmouth.

### 2.2 Relative Health of Populations

In New Hampshire, the abundance of the Nelson's sparrow population during the breeding season is estimated at approximately 50-75 individuals (McElroy and Babbitt, unpublished data). Because a sufficient long-term survey for Nelson's sparrows has not yet been implemented and Breeding Bird Survey routes do not sufficiently cover salt marshes, population trend data are not available. In 2004, a complete survey of all potential breeding salt marshes in New Hampshire was conducted for the presence and abundance of Nelson's sparrows.

Data collected during the 2004 breeding season showed sparrow activity in the following locations, categorized by breeding status (Confirmed Breeding = nests found and/or fledglings observed; Possible Breeding = adults present throughout season, singing activity, no evidence of nests and/or fledglings; Potential Breeding = a few birds present feeding at some point in the season, no evidence of any current breeding activity) (table 1). Estimated Relative Abundance (ERA) categories are also included.

### 2.3 Population Management Status

There are currently no ongoing population management efforts for Nelson's sparrows in New Hampshire (see Salt Marsh Habitat Profile, Element 2.3). All populations should be considered priorities for conservation.

## 2.4 Relative Quality of Habitat Patches

Currently in New Hampshire, Nelson's sparrows breed in *Spartina*-dominated salt marshes on Great Bay that are approximately 20-30 hectares in size (McElroy and Babbitt, unpublished data). Shriver et al. (2004) found that the occurrence of Nelson's sparrows in the Gulf of Maine was correlated with marsh size, proximity to other marshes, and road density surrounding the marsh. However, all New Hampshire salt marshes have the potential to fulfill key ecological functions (e.g., small marshes may not provide suitable nesting habitat, but may be important stopover sites). Research is needed to fully understand habitat quality with respect to Nelson's sparrow ecology.

## 2.5 Habitat Patch Protection Status

See *Salt Marshes habitat profile (element 2.5)*

## 2.6 Habitat Management Status

See *Salt Marshes habitat profile (element 2.6)*

## 2.7 Sources of Information

A literature review provided information on research and habitat management. Research conducted by UNH scientists was used to determine the current health of the population and population management status. The New Hampshire Coastal Program (NHCP) website was used to obtain habitat protection and management information and articles on habitat restoration.

## 2.8 Extent and Quality of Data

Currently, the most extensive dataset comes from researchers at the University of New Hampshire and includes confirmed breeding locations and population estimates throughout the state. However, this dataset is only from one field season. Therefore, a long-term study is needed for an adequate assessment of population health and habitat suitability. There are still significant gaps in knowledge and understanding of Nelson's sparrow populations and the effects of habitat restoration.

## 2.9 Condition Assessment Research

Long-term monitoring of these populations is es-

sential to knowledge of population dynamics, trends, and ecology. Monitoring will provide valuable data to increase understanding of threats to Nelson's sparrow and effects of habitat management efforts.

To determine population abundance at sites of known use and therefore a more accurate assessment of marshes of high protection/conservation priority, a more in-depth monitoring of the breeding population—in addition to point count surveys—is needed. Because this species is non-territorial, point-count surveys and similar methods cannot accurately estimate population abundance. A long-term mark-recapture banding effort of the population would provide a more accurate estimate of sparrow abundance.

With a long-term dataset of presence/absence and abundance estimates at marshes throughout New Hampshire, a map could be produced targeting locations with high densities of breeding birds and hot spots for additional research, conservation, and habitat protection. This information is critical for any future conservation efforts and for research into habitat suitability for this species in New Hampshire.

## ELEMENT 3: SPECIES AND HABITAT THREAT ASSESSMENT

### 3.1.1 DEVELOPMENT (HABITAT LOSS AND CONVERSION)

#### (A) Exposure Pathway

See Salt Marsh Habitat Profile

#### (B) Evidence

Habitat loss is a significant factor in the localized extinctions and decline of wetland birds in northern New England, especially species such as the Nelson's sparrow that use salt marshes for nesting (Greenlaw and Rising 1994). Shriver et al. (2004) found that occurrence of Nelson's sparrows around the Gulf of Maine correlated positively with marsh size and the proximity to other marshes. Therefore, continued habitat loss due to land development likely will reduce Nelson's sparrow populations in New Hampshire.

### 3.1.2 Development (Fragmentation)

See *Salt Marsh Habitat Profile*

### 3.1.3 Altered Hydrology (Tidal Restriction), Transportation Infrastructure

*See Salt Marsh Habitat Profile*

### 3.1.4 Introduced Species (Introduced Plants)

*See Saltmarsh Sharp-tailed Sparrow Profile*

### 3.1.5 Altered Hydrology (Mosquito Ditching)

*See Saltmarsh Sharp-tailed Sparrow Profile*

### 3.1.6 Mercury

*See Saltmarsh Sharp-tailed Sparrow Profile*

## 3.2 Sources of Information

Information on threats to Nelson's sparrows was obtained from a literature review, NHCP, NHHNB, and Biodiversity Research Institute in Gorham, Maine.

## 3.3 Extent and Quality of Data

Researchers and managers have recently given significant attention to threats to Nelson's sparrows. It is well documented that historical marsh degradation from human activities is correlated with decreases in sparrow populations. However, researchers studying the effects of mercury are attempting to evaluate the significance of this new threat to Nelson's sparrows and other salt marsh nesting birds, and continued research is warranted.

## 3.4 Threat Assessment Research

Scientists are assessing threats to Nelson's sparrow populations in Maine and New Hampshire (see references for published studies, McElroy and Babbitt, unpublished data). The impacts of invasive plant species and increased human disturbance surrounding marsh habitat (e.g., increased road density and noise) are two important areas for future research.

Of critical importance, more research is needed to determine the effects of methylmercury on Nelson's sparrow populations in New Hampshire. Methylmercury has become a regional ecological and human health concern. Although the Biodiversity Research Institute is investigating the effects of mercury on salt marsh birds in New England, research is needed especially in New Hampshire. Once mercury effects have been assessed through scientific research, con-

servation actions can be implemented to combat the problem.

## ELEMENT 4: CONSERVATION ACTIONS

### 4.1.1 Protecting remaining salt marsh habitat and surrounding upland buffer habitat, Habitat Protection

*See Saltmarsh Habitat Profile and Saltmarsh Sharp-tailed Sparrow Profile*

### 4.1.2 Restoring degraded salt marshes back to Spartina-dominated systems, Restoration and Management

*See Saltmarsh Habitat Profile and Saltmarsh Sharp-tailed Sparrow Profile*

## ELEMENT 5: REFERENCES

### 5.1 Literature:

- Benoit, L. K., and R. A. Askins. 1999. Impact of the spread of Phragmites on the distribution of birds in Connecticut tidal marshes. *Wetlands* 19: 194-208.
- Benoit, L. K., and R. A. Askins. 2002. Relationship between habitat area and the distribution of tidal marsh birds. *Wilson Bulletin* 114:314-323.
- Brawley, A. H., R. S. Warren, and R. A. Askins. 1998. Bird use of restoration and reference marshes within the Barn Island wildlife management area, Stonington, Connecticut, USA. *Environmental Management* 22:625-633.
- Broome, S. W., E. D. Seneca, and W. W. Woodhouse, Jr. 1988. Tidal salt marsh restoration. *Aquatic Botany* 32:1-22.
- Burdick, D. M., M. Dionne, R. M. Boumans, and F. T. Short. 1997. Ecological responses to tidal restorations of two northern New England salt marshes. *Wetlands Ecology and Management* 4: 129-144.
- Clarke, J. A., B. A. Harrington, T. Hruba, and F. E. Wasserman. 1984. The effect of ditching for mosquito control on salt marsh use by birds in Rowley, Massachusetts. *Journal of Field Ornithology* 55:160-180.
- DiQuinzio, D. A., P. W. C. Paton, and W. R. Eddleman. 2002. Nesting ecology of saltmarsh sharp-tailed sparrows in a tidally restricted salt marsh.

- Wetlands 22:179-185.
- Gavutis, G. W., Jr. 1994. Sharp-tailed Sparrow (*Ammodramus caudacutus*). Pages 324-325 *in* C. Foss, editor. Atlas of breeding birds in New Hampshire. New Hampshire Audubon, Concord, New Hampshire.
- Greenlaw, J. S., and J. D. Rising. 1994. Sharp-tailed Sparrow (*Ammodramus caudacutus*). Number 112 *in* A. Poole and F. Gill, editors. The birds of North America. The Academy of Natural Sciences, Philadelphia, Pennsylvania, USA.
- Hodgman, T. P., W. G. Shriver, and P. D. Vickery. 2002. Redefining range overlap between the sharp-tailed sparrows of coastal New England. *Wilson Bulletin* 114:38-43.
- Hunt, P. 2004(Draft). A regional perspective on New Hampshire's birds of conservation priority: objectives, threats, research needs, and conservation strategies. New Hampshire Audubon, Concord, New Hampshire.
- Johnson, R. G., and S. A. Temple. 1990. Nest predation and brood parasitism of tallgrass prairie birds. *Journal of Wildlife Management* 54:106-111.
- Kamman, N. C., P. M. Lorey, C. T. Driscoll, R. Estabrook, A. Major, B. Pientka, and E. Glassford. 2004. Assessment of mercury in waters, sediments, and biota of New Hampshire and Vermont lakes, USA, sampled using a geographically random design. *Environmental Toxicology and Chemistry* 23:1172-1186.
- Lane, O., and D. Evers. 2005. Developing a geographic exposure profile of methylmercury availability in salt marshes of New England. Report BRI 2005-04 submitted to the Maine Department of Inland Fisheries and Wildlife, Maine Department of Environmental Protection, and Rachel Carson National Wildlife Refuge. Biodiversity Research Institute, Gorham, Maine.
- Mitsch, W. J., and J. G. Gosselink. 2000. *Wetlands*. Third edition. John Wiley & Sons, Inc., New York, New York.
- NHCP (New Hampshire Coastal Program). New Hampshire Department of Environmental Services, Concord, New Hampshire. NHCP home page: <http://www.des.state.nh.us/Coastal/> Accessed 2004 November.
- NHNHB (New Hampshire Natural Heritage Bureau). 2004. Natural communities of New Hampshire. <http://www.nhdf.org/formgt/nhiweb/Documents/NaturalCommunitiesWeb.pdf> Accessed 2004 November.
- Niehaus, A. C., S. B. Heard, S. D. Hendrix, and S. L. Hillis. 2003. Measuring edge effects on nest predation in forest fragments: do finch and quail eggs tell different stories? *American Midland Naturalist* 149:335-343.
- Niering, W. A., and R. S. Warren. 1980. Vegetation patterns and processes in New England salt marshes. *BioScience* 30:301-306.
- Post, W., and J. S. Greenlaw. 1994. Seaside sparrow (*Ammodramus maritimus*). Number 127 *in* A. Poole and F. Gill, editors. The birds of North America. The Academy of Natural Sciences, Philadelphia, Pennsylvania, USA.
- Reinert, S. E., F. C. Golet, and W. R. DeRagon. 1981. Avian use of ditched and unditched salt marshes in southeastern New England: a preliminary report. Presented at the 27<sup>th</sup> Annual Meeting, Northeastern Mosquito Control Association, Nov. 2-4, 1981, Newport, Rhode Island.
- Roman, C. T., W. A. Niering, and R. S. Warren. 1984. Salt marsh vegetation change in response to tidal restriction. *Environmental Management* 8: 141-150.
- Shriver, W. G., D. Evers, and T. Hodgman. 2002. Mercury exposure profile for sharp-tailed sparrows breeding in coastal Maine salt marshes. Report BRI 2002-11 submitted to the Maine Department of Environmental Protection. Biodiversity Research Institute, Gorham, Maine.
- Shriver, W. G., T. P. Hodgman, J. P. Gibbs, and P. D. Vickery. 2004. Landscape context influences salt marsh bird diversity and area requirements in New England. *Biological Conservation* 119:545-553.
- Sibley, D. 1996. Field identification of the sharp-tailed sparrow complex. *Birding* 28:197-208.
- Sinicrope, T. L., P. G. Hine, R. S. Warren, and W. A. Niering. 1990. Restoration of an impounded salt marsh in New England. *Estuaries* 13:25-30.
- Warren, R. S., P. E. Fell, R. Rozsa, A. H. Brawley, A. C. Orsted, E. T. Olson, V. Swamy, and W. A. Niering. 2002. Salt marsh restoration in Connecticut: 20 years of science and management. *Restoration Ecology* 10:497-513.

## 5.2 Data Sources:

NHBR. New Hampshire Bird Records, New Hampshire Audubon, Concord, New Hampshire.

PIF (Partners in Flight). Species assessment database. Bird conservation regions: breeding scores for BCR 30 and BCR 14. PIF homepage: <http://www.rmbo.org/pif/pifdb.html>  
Accessed 2005 April

## ELEMENT 6: LIST OF FIGURES

Table 1. New Hampshire salt marshes with Nelson's sharp-tailed sparrows during the 2004 breeding season (McElroy and Babbitt, unpublished data).

MARSH	TOWN	BREEDING	ERA
Chapman's Landing	Stratham	Confirmed	16 – 30
Squamscott River	Newfields	Confirmed	< 15
Sagamore Creek	Portsmouth	Possible	< 15
Hampton Beach	Hampton	Potential	< 15
Little River	Hampton	Potential	< 15
Bay Road	Newmarket	Potential	< 15

## Distribution of Nelson's Sharp-tailed Sparrow in New Hampshire



Known = confirmed breeding observations as reported in the NH Natural Heritage Bureau's Element Occurrence Database and obtained from a University of New Hampshire survey.  
Potential = possible breeding and other observations from the same data sources.

