

Species Status Assessment

Common Name: Seaside Sparrow **Date Updated:** 2024-12-20
Scientific Name: *Ammospiza maritima* **Updated By:** Tgh, V. Bonaiuto
Class: Aves
Family: Passerellidae

Species Synopsis

(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):

Nine subspecies of seaside sparrows are recognized along the Atlantic Coast from Maine to the Gulf Coast. The most northerly subspecies, *A. m. maritimus*, breeds from southern Maine to Virginia where salt marshes occur. In New York, seaside sparrow occurs in estuarine and salt marsh habitat primarily on the south shore of Long Island, though populations also persist on Long Island Sound (Westchester County) and the east end of Long Island. Though some birds remain in New York during the winter, most move to coastal areas in the southern United States.

Long-term losses documented in New York since the late 1800s (Schneider 1998, Greenlaw 2008) have been attributed to habitat alteration (mosquito ditching and filling) and to predation, especially by Norway rats.

I. Status

a. Current legal protected Status

- i. Federal: Not listed **Candidate:**
ii. New York: Special Concern

b. Natural Heritage Program

- i. Global: G4
ii. New York: S2S3B **Tracked by NYNHP?** On Active Tracking List

Other Ranks:

NYS 2025 SGCN status: High Priority Species of Greatest Conservation Need
COSEWIC: Not listed in Canada

IUCN Red List: Not assessed by IUCN Red List
 Northeast Regional SGCN: Watchlist [Assessment Priority]

Status Discussion:

Seaside sparrow was formerly a locally common breeder in the Coastal Lowlands but has declined in the last 100 years due to loss of coastal marshes. It does not occur outside of the coastal areas. Birds are regular, though uncommon, during the winter. Breeding Bird Atlas data indicates the population is becoming less widespread.

II. Abundance and Distribution Trends

Region	Present ?	Abundance	Distribution	Time Frame	Listing status or S-Rank	SGCN?
North America	Yes	Increasing	Unknown	BBS 1966-2022 trend for US		
Northeastern US	Yes	Declining	Unknown	BBS 1966-2022 trend		Watchlist [Assessment Priority]
New York	Yes	Unknown	Unknown	Unknown	SC; S2S3B	Yes
Connecticut	Yes	Unknown	Unknown	Unknown	T; S3B	Yes
Massachusetts	Yes	Unknown	Unknown	Unknown	S2	Yes
New Jersey	Yes	Unknown	Unknown	Unknown	S4B,S4N	Yes
Pennsylvania	No	Unknown	-	Unknown		
Vermont	No	Unknown	-	Unknown		
Ontario	No	Unknown	-	Unknown		
Quebec	No	Unknown	-	Unknown		

Column options

Present?: Yes; No; Unknown; No data; (blank) or Choose an Item

Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item

SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York

(specify any monitoring activities or regular surveys that are conducted in New York):

The Saltmarsh Habitat and Avian Research Program (SHARP) monitors populations of tidal marsh birds and the health of tidal habitats in the New England and Mid-Atlantic states. Seaside sparrow is one of the focus species monitored on Long Island.

Trends Discussion

(insert map of North American/regional distribution and status):

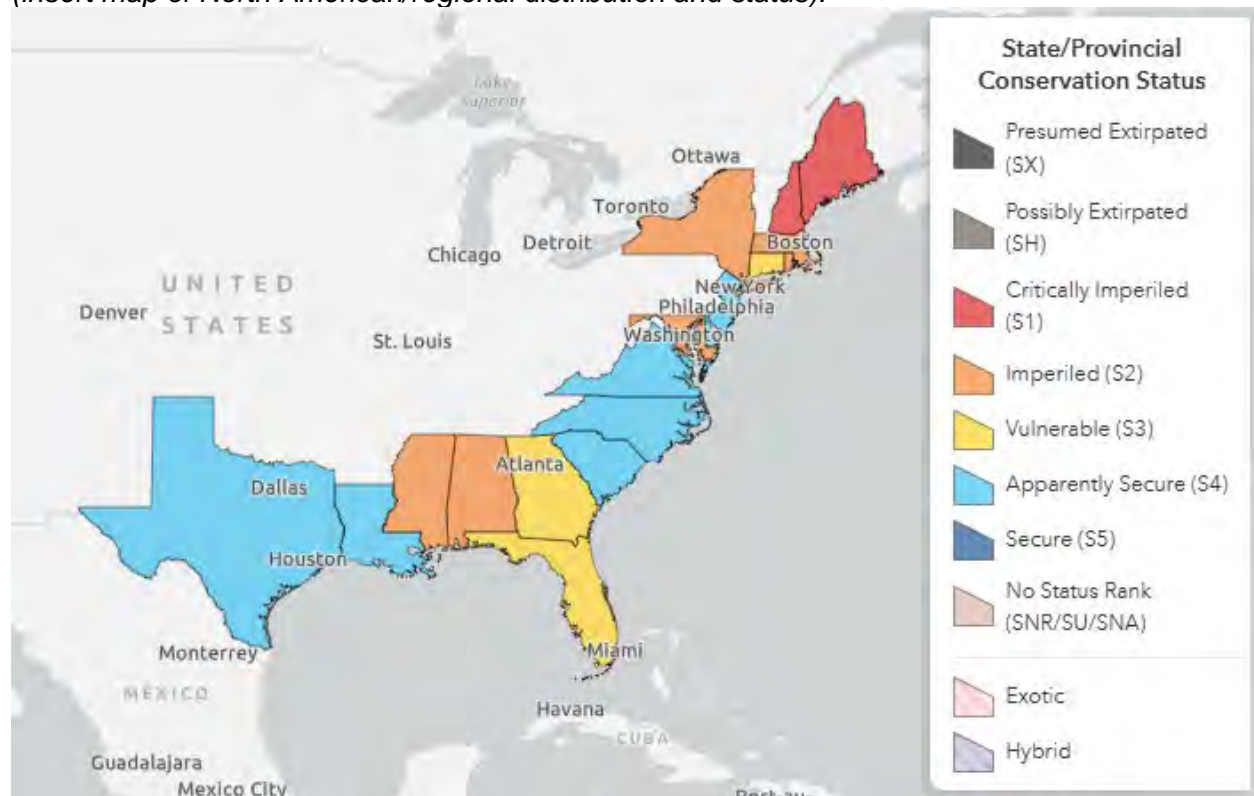
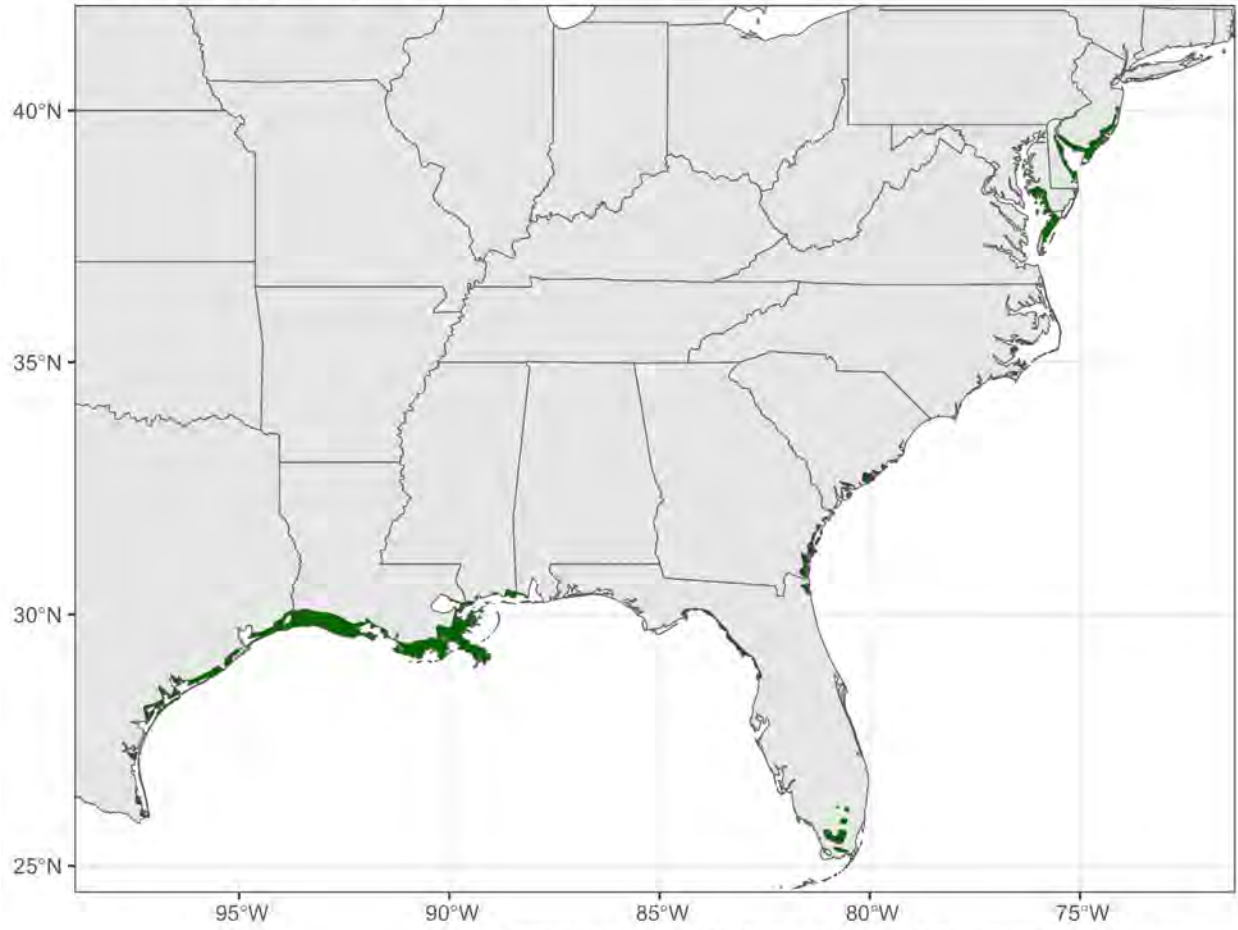


Figure 1. Conservation status of seaside sparrow in North America (NatureServe 2025).

Breeding range map for Seaside Sparrow



Range map data from eBird Status and Trends, Data Version: 2022; Released: 2023

Figure 2: Breeding range for seaside sparrow (eBird)

Year-round range map for Seaside Sparrow



Range map data from eBird Status and Trends, Data Version: 2022; Released: 2023

Figure 3: Full (year-round) range for seaside sparrow (eBird).

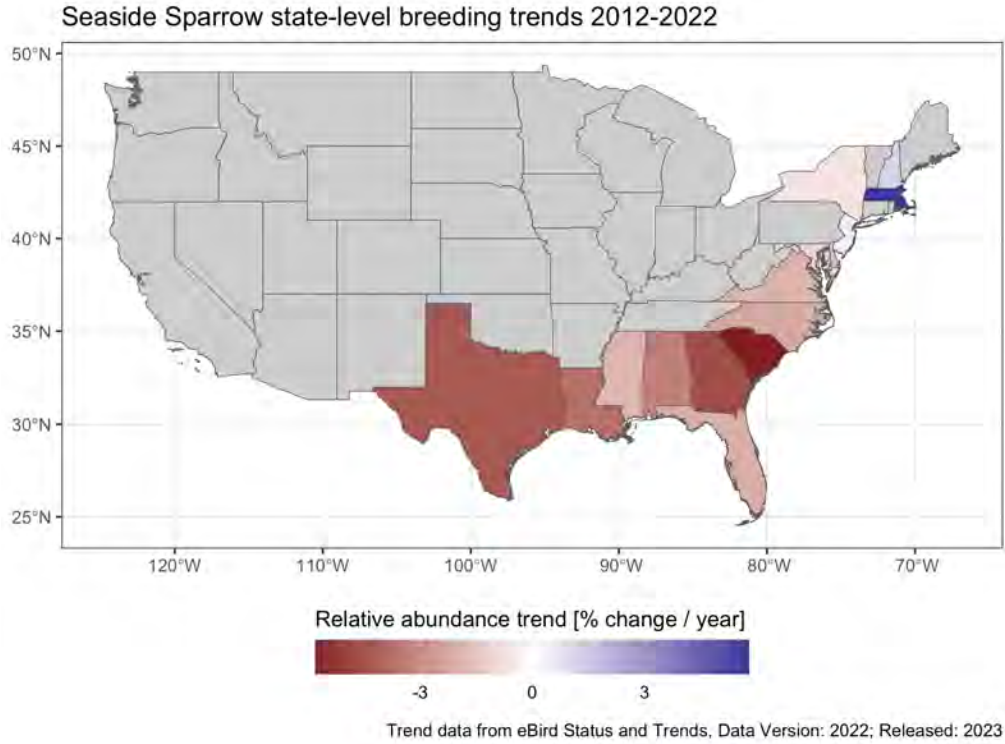


Figure 4: Trends, by state, for seaside sparrow. Data source is eBird.

III. New York Rarity

(provide map, numbers, and percent of state occupied)



Figure 1: NYS breeding range for seaside sparrow based on eBird data.

Details of historic and current occurrence:

The first Breeding Bird Atlas (BBA) (1980-85) documented occupancy in 48 blocks, 0.9% of the survey blocks statewide (Andrle and Carroll 1988). The second BBA (2000-05) documented occupancy in 36 blocks, 0.7% of the survey blocks statewide (McGowan and Corwin 2008).

The third BBA (2020-25) is currently underway and utilizes a different number and layout of survey blocks across New York, making direct comparison with the first two Atlases difficult. There were 5,333 blocks in the first and second BBAs, and there are 5,710 blocks in the current BBA, of which 1,815 are considered priority blocks. To date, seaside sparrow has been documented in 30 priority blocks, 0.7% of all priority blocks statewide during the third BBA (NY BBA III Overview, 2024).

New York’s Contribution to Species North American Range:

Based on eBird data, 0.52 percent of the population breeds in New York, while 0 percent of the non-breeding population occurs in New York. Among all states with breeding populations, New York ranks 11 of 16.

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Core	

Column options

Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50% 1-25%; 0%; Choose an item

Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type

(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):

NatureServe broad habitat types: Herbaceous wetland

NY Natural Heritage Communities: High salt marsh, Low salt marsh, Salt panne

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/ Increase
Yes	Yes	Unknown	Unknown

Column options

Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item.

Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item.

Habitat Discussion:

The seaside sparrow is a habitat specialist that occupies coastal tidal marshes throughout most of its limited range. Birds in the northeastern portion of the range, including New York, use both high and low marsh. High marsh may provide marginal habitat; areas are dominated by salt meadow grass (*Spartina patens*), black grass (*Juncus gerardi*), glasswort (*Salicornia* spp.) and marsh elder (*Iva frutescens*). Low marsh is dominated by smooth cordgrass (*Spartina*

alterniflora) and birds select nesting locations near grass tufts (Greenlaw 1983). Birds avoid areas of uniform salt meadow grass in high marsh and nest along edges with marsh elder. Drier, more upland sites consisting of salt panne are used infrequently and brackish marshes historically were used in New York (Levine 1998). Higher quality habitat generally consists of elevated sites removed from flooding with muddy open areas for feeding (Levine 1998).

V. Species Demographics and Life History

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/Catadromous?
Yes	Yes	No	Yes	Yes	No

Column options

First 5 fields: Yes; No; Unknown; (blank) or Choose an item.

Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item.

Species Demographics and Life History Discussion

(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):

From Post et al. (2009): Both sexes begin breeding in the spring after their hatching year. Two broods are reared successfully by some pairs in New York (Greenlaw 1992). The number of young fledged per female per year in New York is estimated to be 4.43 (Post and Greenlaw 1982). Adults are highly philopatric, and some first-year birds in New York return to breed in their natal marshes (Greenlaw 1992). The estimated lifetime reproductive output of an average female is 2.72 in New York (Post et al. 1983).

Seaside sparrow territory is nest-centered and usually is enclosed within a larger, undefended home range (activity space) that includes additional feeding sites (Post 1974). Population sizes can vary from one or two territorial males isolated on a marsh to many dozens of males on contiguous or overlapping activity spaces (Post 1974, Greenlaw 1983, Post et al. 1983). Only a few studies supply information on breeding densities in the Northeast. With one exception on Long Island, densities ranged from 64-214 singing males per square km on marshes from Maryland to New York (Post 1970, Robbins 1983). Post (1970) reported an exceptionally high density of 2,000 males per square km on an unaltered low marsh on Long Island. On the same marsh several years later, Greenlaw (1983) found 982 males per square km. The two latter values are ecological densities (unsuitable habitat and a tidal pool were excluded from calculations), while most or all of the values reported elsewhere (see Robbins 1983 for summary) are crude densities. Post's (1970) value may be exceptionally high because his survey focused on a relatively small area of the marsh (2.75 ha) that contained a dense cluster of territories (see Post 1974). Densities in New England varied from two to 114 males per square km (Reinert et al. 1981, Marshall 1986, DeRagon 1988, Marshall and Reinert 1990). The mean density in the region for all types was 30.1 males per square km. These are all crude densities. Ditched and unaltered marshes usually support different densities, with highest densities in the latter habitat (Post 1970, 1974, Reinert et al. 1981, Greenlaw 1983, DeRagon 1988).

The patchy, uneven dispersion of breeding sparrows on marshes, and their absence from apparently suitable microhabitat in some areas, have led authors to describe the bird as "colonial" or "semicolonial" (e.g., Nicholson 1928, 1946, Stimson 1968, Werner 1975, Austin

1983). This is misleading since evidence suggests that clusters of territories simply reflect a common response to widespread patterns of temporal and spatial heterogeneity in saltmarsh vegetation (Post 1974, Greenlaw 1983, Post et al. 1983). The absence of breeding birds from seemingly suitable areas can be a simple consequence of low population size and poor recruitment.

Based on cumulative return rates, adult survival was estimated to be 57-60% for a population on an unaltered low marsh in New York (Post et al. 1983). Post-fledging survival to independence of birds banded as nestlings in New York was 36% (Post and Greenlaw 1982). The estimated lifetime reproductive output of an average female (replacement rate) of 2.72 (2-year average) in a New York population suggests that the population was increasing (Post et al. 1983). This population exhibited an exceptionally high breeding density (Post 1970).

Remarkably little is known about the behavior and ecology of northern sparrows on their wintering grounds. Burleigh (1958) commented that northern sparrows in Georgia confined their activity to dense saltmarsh grasses where they were quiet and inconspicuous. In the Southeast, they mingle with the resident birds.

VI. Threats

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
3. Energy Production & Mining	3.1 Oil & Gas Drilling	Choose an item. (spills)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
7. Natural System Modifications	7.2 Dams & Water Management/Use	Choose an item. (ditching/dredging)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
7. Natural System Modifications	7.3 Other Ecosystem Modifications	7.3.3 Natural erosion & sedimentation	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.1 Invasive Non-Native Plants & Animals	8.1.1 Terrestrial animals (domestic cats)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.1 Invasive Non-Native Plants & Animals	8.1.4 Aquatic plants (common reed)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.2 Industrial & Military Effluents	9.2.5 Mercury	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	9.3.3 Herbicides & pesticides (mosquito spraying)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.1 Habitat Shifting & Alteration	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.5 Storms & Severe Weather	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Table 1. Threats to seaside sparrow

Historically and currently, seaside sparrow populations have been negatively affected by the loss and degradation of salt marsh habitats, which are regularly filled or ditched for mosquito control (Austin 1983, Greenlaw 1992). Though breeding still occurs in compromised marshes, productivity is lower. Ditching eliminates preferred foraging patches (*Spartina alterniflora*), associated mud pools and mudflats, which are replaced by woody species and reed and have relatively low feeding value (Merriam 1983). In the Northeast in particular, common reed (*Phragmites australis*) has expanded its range in response to lowering of water levels, replacing salt meadow grasses and degrading breeding habitats (Paxton et al. 2007). Lowering of water levels and invasion of bushes along ditch banks increase access to predators (see Post et al. 2009).

Climate change is expected to affect the extent and quality of salt marshes. In the next century, a predicted sea-level rise of 2-4+ mm/yr, accompanied by increased storm frequency, would accelerate loss of tidal marshes. The effect would be most severe in the Northeast, where sediment delivery rates are lower than in Southeast (Shriver et al. 2004, Erwin et al. 2006). Seaside sparrow was classified as “moderately vulnerable” to predicted climate change in an assessment of vulnerability conducted by the New York Natural Heritage Program (Schlesinger et al. 2011).

Because of its narrow coastal range and localized distribution, populations of seaside sparrow in any given area may be displaced or extirpated by storms (flooding), fires, or oil spills. Also, a low incidence of pox disease occurs in New York (Greenlaw 1992).

Exposure to mercury is a threat to seaside sparrows; high exposure may result in detrimental physiological and behavioral changes, including reduced reproductive success (Lane et al. 2011, NYSERDA 2012). On Long Island, mercury concentration levels in the blood and/or flight feathers of this sparrow were high enough to indicate a reduction in reproductive success in more than half of all individuals sampled (NYSERDA 2012).

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

Yes: ✓ **No:** **Unknown:**

If yes, describe mechanism and whether adequate to protect species/habitat:

This species is included in the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712) and is protected as a native species under the NYS Environmental Conservation Law. It also receives additional protections as a species listed as Special Concern in New York State.

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

Action Category	Action	Description
A.1 Direct Habitat Management	A.1.0.0.0 Direct habitat management	Site/Area management
A.1 Direct Habitat Management	A.1.1.0.0 Manage plants, animals, fungi, or bacteria	Invasive/Problematic species control
B.3 Outreach	B.3.1.0.0 Outreach, communication, and distribution	Promote alternative products/services
B.5 Economic and Other Incentives	B.5.0.0.0 Economic and other incentives	-Market forces to change behaviors -Conservation payments to change behaviors
C.6 Design and Plan Conservation	C.6.5.0.0 Conservation planning	-Site/Area protection -Resource/Habitat Protection
C.6 Design and Plan Conservation	C.6.5.1.3 Develop a conservation, management, or restoration plan for protected private lands	Habitat/Natural process restoration
C.7 Legislative and Regulatory Framework or Tools	C.7.1.0.0 Create, amend, or influence legislation, regulation, or codes	-formal government sector legislation or policies at all levels -affecting implementation of laws at all levels
C.10 Institutional Development	C.10.2.0 External support and organizational development	Institutional & Civil Society Development
C.10 Institutional Development	C.10.4.1.0 Securing/raising funds required to carry out conservation measures	Conservation finance raising/providing funds

Table 3. Recommended conservation actions for *seaside sparrow*.

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for salt marsh breeding birds, which includes seaside sparrow.

Habitat Management:

- _____ Develop coordinated and specific habitat management and restoration projects for identified focus areas.
- _____ Integrate bird conservation interests in agency planning, management, research, restoration, and permitting actions, within the context of agency missions.
- _____ Protect extant salt marsh habitat through:

- Developing and implementing a salt marsh management and restoration plan.
- Mapping extant salt marshes in the Lower Hudson/Long Island Bays Watershed.
- Implementing a “no net increase” in shoreline armoring for all estuaries, bays, and harbors in the watershed.
- Protecting land and requiring upland buffers associated with salt marsh habitat.
- Establishing vegetated buffers landward of salt marshes.
- Protecting salt marsh platforms of shoals and flats created by temporary barrier island beaches and overwash fans.
- Modifying tidal wetland laws, regulations, and policies to address sea level rise.

Habitat Monitoring:

_____ Regularly monitoring status and trends of salt marsh habitat through aerial surveys and site-based monitoring.

Habitat Research:

_____ Identify strategies and develop a plan for slowing the loss of emergent tidal salt marsh to erosion, fragmentation, and invasive species.

Habitat Restoration:

_____ Alternative methods of mosquito control should be investigated to allow the modification of mosquito ditching to restore native ecological habitats, by allowing vegetated tidal wetlands to take precedence over mosquito control efforts in some areas. Mosquito ditching should be removed/closed when possible.

_____ Financial incentives for landowners to remove bulkheads and plant native vegetation in upland buffer area to protect salt marshes.

_____ Work with State, Federal, Local, and NGOs to identify tidal wetlands and fund their restoration to intact emergent salt marsh. Develop coordinated and specific habitat restoration projects for identified focus areas.

_____ Develop NYS guidelines for salt marsh restoration. The guidelines should include information on the following:

- Phragmites control
- Reconnecting disjunct or fragmented salt marshes
- Reducing nutrient loading into salt marshes from road run-off septic systems, fertilizers, etc.
- Naturalizing and softening the shoreline
- Natural and “soft” alternatives to bulkheads

Invasive Species Control:

_____ Develop plan for addressing habitat loss to invasive Phragmites reed.

Life History Research:

_____ Identify critical habitat components for supporting each species.

Population Monitoring:

- _____ Initiate statewide, comprehensive salt marsh-breeding bird survey for Seaside Sparrow, Salt Marsh Sharp-tailed Sparrow, Black Rail, and Clapper Rail. Resurvey active sites annually, and all habitat sites every 5 years. Continue annual tern surveys and gull surveys every three years as part of Long Island Colonial Waterbird Survey.

Statewide Baseline Survey:

- _____ Initiate statewide, comprehensive salt marsh-breeding bird survey for Seaside Sparrow, Salt marsh Sharp-tailed Sparrow, Black Rail, and Clapper Rail.

Statewide Management Plan:

- _____ Develop coordinated, statewide management plan that takes into consideration differences in habitat needs, species distribution, life histories, and human impacts.

VII. References

This SSA drew heavily from these resources:

eBird. 2024. eBird: An online database of bird distribution and abundance [web application]. eBird, Cornell Lab of Ornithology, Ithaca, New York. Available: <http://www.ebird.org>. [Accessed: 11/25/2024].

Ziolkowski Jr., D.J., Lutmerding, M., English, W.B., and Hudson, M-A.R., 2024, North American Breeding Bird Survey Dataset 1966 - 2023: U.S. Geological Survey data release, <https://doi.org/10.5066/P136CRBV>.

New York Natural Heritage Program, State University of New York College of Environmental Science and Forestry. 2024. Element Occurrence and Element Dataset. Albany, New York. [Exported 11/20/2024].

NatureServe. 2024. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. <http://www.natureserve.org/explorer>. [Accessed 11/20/2024].

Additional references:

American Ornithologists' Union (AOU). 1983. Check-list of North American Birds, 6th edition. Allen Press, Inc., Lawrence, Kansas. 877 pp.

Andrle, Robert F. and Janet R. Carroll, editors. 1988. The atlas of breeding birds in New York State. Cornell University Press. 551 pp.

Bull, John. 1974. Birds of New York State. Doubleday, Garden City, New York. 655 pp.

Bull, John. 1976. supplement to birds of New York State. Special publ. of Federation of New York State Bird Clubs. 52 pp.

Carter, M., C. Hunter, D. Pashley, and D. Petit. 1998. The Watch List. Bird Conservation, Summer 1998:10.

- Ehrlich, P. R., D. S. Dobkin, and D. Wheye. 1992. *Birds in Jeopardy: the Imperiled and Extinct Birds of the United States and Canada, Including Hawaii and Puerto Rico*. Stanford University Press, Stanford, California. 259 pp.
- Giraud, J.P., Jr. 1844. *Birds of Long Island*. Wiley and Putnam, New York.
- Greenlaw, J. S. 1992. Seaside sparrow, *AMMODRAMUS MARITIMUS*. Pages 211-232 in K. J. Schneider and D. M. Pence, editors. *Migratory nongame birds of management concern in the Northeast*. U.S. Fish and Wildlife Service, Newton Corner, Massachusetts. 400 pp.
- Greenlaw, J. S. 1992. Seaside Sparrow, *Ammodramus maritimus*. Pages 211-232 in *Migratory nongame birds of management concern in the northeast*. (Schneider, K. J. and D. M. Pence, Eds.) U.S. Dept. Interior, Fish and Wildl. Serv. Newton Corner, MA.
- Greenlaw, J.S. 1983. Microgeographic distribution of breeding seaside sparrows on New York salt marshes. pp 99-114. In: *The seaside sparrow, its biology and management*.
- Harrison, C. 1978. *A Field Guide to the Nests, Eggs and Nestlings of North American Birds*. Collins, Cleveland, Ohio.
- Levine, E. 1998. *Bull's birds of New York State*. Comstock Publishing Associates, Ithaca, NY.
- Marshall, R. M., and S. E. Reinert. 1990. Breeding ecology of seaside sparrows in a Massachusetts salt marsh. *Wilson Bull.* 102:501-513.
- McDonald, M. V. 1988. Status survey of two Florida seaside sparrows and taxonomic review of the seaside sparrow assemblage. Technical Report No. 32, U.S. Fish and Wildlife Service, Jacksonville, Florida.
- McGowan, K.J. and K. Corwin, eds. 2008. *The Second Atlas of Breeding Birds in New York State: 2000-2005*. Cornell University Press, Ithaca, NY. 688 pp.
- Merriam, T.L. 1979. Feeding ecology and food overlap of two sympatric marsh-inhabiting sparrows. Master's thesis, Long Island University, Brookville, NY.
- National Geographic Society (NGS). 1999. *Field guide to the birds of North America*. Third edition. National Geographic Society, Washington, DC. 480 pp.
- New York State Breeding Bird Atlas. 1985. Final breeding bird distribution maps, 1980-1985. New York State Department of Environmental Conservation, Wildlife Resources Center. Delmar, NY.
- New York State Department of Environmental Conservation. Checklist of the amphibians, reptiles, birds, and mammals of New York State, including their protective status. Nongame Unit, Wildlife Resources Center, Delmar, NY.
- Post, W., W. Post and J. S. Greenlaw. 2009. Seaside Sparrow (*Ammodramus maritimus*), *The Birds of North America Online* (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the *Birds of North America Online*: <http://bna.birds.cornell.edu/bna/species/127>
doi:10.2173/bna.127
- Post, W., and J.S. Greenlaw. 1994. Seaside Sparrow (*Ammodramus maritimus*). In A. Poole and F. Gill, editors. *The Birds of North America*, No. 127. Academy of Natural Sciences, Philadelphia, and American Ornithologists' Union, Washington, DC. 28 pp.

Post, W., J.S. Greenlaw, T.L. Merriam and L.A. Wood. 1983. Comparative ecology of northern and southern populations of the seaside sparrow. pp 123-136. In: The seaside sparrow, its biology and management.

Quay, T. L., et al., editors. 1983. The seaside sparrow, its biology and management. Occas. Pap. North Carolina Biol. Surv. 1983-5. 174 pp.

Sauer, J.R., J.E. Hines, and J. Fallon. 2007. The North American breeding bird survey, results and analysis 1966-2006. Version 10.13.2007. US Geological Survey, Patuxent Wildlife Research Center, Laurel, MD.

Stevenson, H. M., and B. H. Anderson. 1994. The birdlife of Florida. University Press of Florida, Gainesville. 892 pp.

Stoll, M. J., and F. C. Golet. 1983. Status of the seaside sparrow in Rhode Island. Aud. Soc. Rhode Island Rep. 17:57-61.

Terres, J. K. 1980. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York.

Walters, M. J. 1992. A shadow and a song: the extinction of the dusky seaside sparrow. Chelsea Green Publishing Company 256 pp.

Zink, R. M., and J. C. Avise. 1990. Patterns of mitochondrial DNA and allozyme evolution in the avian genus AMMODRAMUS. Syst. Zool. 39:148-161.

Originally prepared by	
Date first prepared	
First revision	
Last revision	