

SPECIES PROFILE

Willet

Catoptrophorus semipalmatus

Federal Listing: Not listed

State Listing: Special concern

Global Rank: G5

State Rank: S3B

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ELEMENT 1: DISTRIBUTION AND HABITAT

1.1 Habitat Description

Willetts inhabit salt marshes, or grass-dominated tidal wetlands existing in the transition zone between ocean and upland (Niering and Warren 1980) (see Salt Marshes habitat profile). In New Hampshire, willets breed in large salt marshes dominated by *Spartina* grasses (Gavutis 1994, Lowther et al. 2001). Willets forage in sparsely vegetated *Spartina* grasses, along tidal creeks, at salt marsh edges, and at mussel beds and mudflats near salt marshes (Lowther et al. 2001). Their diet consists primarily of crustaceans, mollusks, polychaetes, and adult and larval insects (Lowther et al. 2001).

1.2 Justification

In New Hampshire, the willet is identified as a species of special concern. Little data exist on willet population trends, estimates, and threats in the state, and no long-term studies of the species have been conducted in New Hampshire. Loss and degradation of salt marshes are probably the most pressing threats to willet populations in New Hampshire. High-quality salt marsh habitat must be available in large patches across a landscape to support a population's survival 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 com-

mon 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 willets because they are not suitable habitat.

The lack of knowledge of population sizes and threats in New Hampshire is similar for other salt marsh nesting birds, such as salt marsh sharp-tailed sparrow and seaside sparrow. Research and monitoring of this salt marsh guild may indicate marsh health and provide insight into effects of marsh degradation and outcomes of restoration and other management practices.

1.3 Protection and Regulatory Status

- The Migratory Bird Treaty Act of 1918 legally protects willets from the take, transport, and use of the species (including eggs, nests, and feathers).
- Salt marsh habitat is regulated by NHDES. Activities that may involve filling, dredging, or destroying wetlands are strictly regulated and require approved permits before work can commence (RSA 482-A).

1.4 Population and Habitat Distribution

Eastern willets (i.e., the eastern subspecies) breed in coastal wetlands along the Atlantic and Gulf coasts (Lowther et al. 2001). In New Hampshire, willets breed in large salt marshes (Gavutis 1994, NHBR, McElroy and Babbitt, unpublished data). While willets may use any of these marshes as migratory habitat, breeding occurs in Hampton and Seabrook salt (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 to obtain willet habitat, population distribution, and status data. Historical information on the distribution of willets in New Hampshire comes from NHA's database of bird records. Information on current population distribution and status comes from data collected in 2004 by researchers from UNH.

1.8 Extent and Quality of Data

Historical bird records from NHA are 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. The most comprehensive dataset comes from UNH researchers and includes confirmed breeding locations and population estimates throughout the state. Although this dataset is extensive, it covers only one year. Therefore, significant gaps exist in understanding of willet breeding populations throughout the state, and long-term trends in population locations and sizes in New Hampshire are unknown.

1.9 Distribution Research

To determine willet distribution in New Hampshire, a long-term survey of salt marsh habitat specifically for willets (i.e., point counts conducted during breeding season at established points) is needed in conjunction with regional efforts. It is essential that monitoring is long term because salt marsh habitat quality changes, potentially affecting willet populations from one breeding season to the next.

ELEMENT 2: SPECIES/HABITAT CONDITION

2.1 Scale

The New Hampshire conservation unit for the willet is Coast (including Rye, Hampton, and Seabrook)

2.2 Relative Health of Populations

In New Hampshire, the willet population during the breeding season is estimated at 100 individuals (McElroy and Babbitt, unpublished data). Because

a sufficient long-term survey of willets has not been implemented and Breeding Bird Survey routes do not sufficiently cover salt marshes, data on population trends are not available. In 2004, a complete survey focused on the presence and abundance of willets at all potential breeding sites in New Hampshire's salt marshes (McElroy and Babbitt, unpublished data).

Data from the 2004 breeding season showed willet activity at the following sites, grouped by breeding category (Confirmed Breeding = nest(s) found; Possible Breeding = adults present throughout season, calling & territorial behavior, 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

New Hampshire currently has no ongoing population management efforts for willets. The large marsh complex in Hampton contains all known breeding and possible breeding populations. Therefore, this location should be a priority for any conservation actions. In particular, the marsh off Route 1A between Routes 101 and 101E is an important breeding site for willets.

2.4 Relative Quality of Habitat Patches

In New England, willets breed in large, unrestricted, *Spartina*-dominated marshes with nearby foraging areas (Gavutis 1994, Lowther et al. 2001, McElroy and Babbitt, unpublished data). Most marshes along the coast in Hampton, Rye, and Seabrook potentially have the key ecological attributes (e.g., migratory or nesting habitat), but more research is needed to better understand the marshes' habitat quality for willets.

2.5 Habitat Patch Protection Status

See Salt Marshes habitat profile

2.6 Habitat Management Status

See Salt Marshes habitat profile

2.7 Sources of Information

A literature review provided information on research

and habitat management. Research by UNH scientists provided an assessment of population and management status. Information on habitat protection and management came from the New Hampshire Coastal Program's website and published articles on habitat restoration.

2.8 Extent and Quality of Data

The most extensive dataset comes from researchers at UNH. It includes confirmed breeding locations and population estimates throughout the state. However, this dataset covers only one field season. An adequate assessment of population health and habitat suitability would require a long-term study. Significant gaps exist in understanding of willet populations and the effects of habitat restoration in New Hampshire.

2.9 Condition Assessment Research

Long-term monitoring of willet populations is essential for knowledge of population dynamics, trends, and ecology. It would provide valuable data to increase understanding of threats to the species and the 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), in-depth monitoring of the breeding population (in addition to point count surveys) is needed. This species is territorial, so point count surveys and similar methods can be used effectively to estimate population abundance and potential breeding sites.

Additionally, a long-term dataset of presence/absence and abundance estimates at marshes throughout New Hampshire would allow development of a GIS map showing locations with high densities of breeding willets. The maps would help target hotspots for research, conservation, and habitat protection.

ELEMENT 3: SPECIES THREAT ASSESSMENT

3.1.1 Development (Habitat Loss)

(A) Exposure Pathway

See Salt Marshes habitat profile and Saltmarsh Sharp-tailed Sparrow profile

(B) Evidence

Habitat loss is a significant factor in the decline of wetland birds that depend on salt marshes for nesting (Greenlaw and Rising 1994, Benoit and Askins 1999). Habitat loss could potentially affect willet population size; Shriver et al. (2004) found that occurrences of willets in the Gulf of Maine correlated with marsh size and proximity to other marshes. In Connecticut, willets were present only in marshes larger than 138 hectares (Benoit and Askins 2002). Therefore, continued habitat loss due to development pressures is likely to negatively affect willet populations in New Hampshire.

3.1.2 Development (Fragmentation)

(A) Exposure Pathway

See Salt Marshes habitat profile and Saltmarsh Sharp-tailed Sparrow profile

(B) Evidence

Willetts are considered area-sensitive species, and populations could be negatively impacted by habitat fragmentation and decreasing patch size. In Connecticut, willet densities exhibited a positive relationship with marsh area (Benoit and Askins 2002).

3.1.3 Altered Hydrology (Tidal Restriction)

(A) Exposure Pathway

See Sharp-tailed Sparrow profile

(B) Evidence

Vegetative composition and structure are important components of willet ecology. Willets build nests along edges of salt marshes in smooth cordgrass, salt hay grass, or on wrack in the high marsh (Lowther et al. 2001, McElroy and Babbitt, unpublished data). However, brackish species and invasive plant species tend to replace salt marsh grasses in tidally restricted marshes (Niering and Warren 1980, Benoit and Askins 1999). Salt marshes with severe tidal restrictions lack quality nesting habitat for willets (Lowther et al. 2001).

3.1.4 Introduced Species (Introduced Plants)

(A) Exposure Pathway

See Sharp-tailed Sparrow Profile

(B) Evidence

Dense, monotypic stands of common reed provide unsuitable or less-preferable habitat and food for many wildlife species (Roman et al. 1984). Willets are normally found in *Spartina* spp. grass and are unlikely to use a marsh dominated by tall, thick stands of common reed or cattails. According to Benoit and Askins (1999), the presence of smooth cordgrass at a site was a significant predictor for the abundance of willets. Willets were absent from survey plots with mixed brackish vegetation, cattail, and common reed (Benoit and Askins 1999).

3.1.5 Altered Hydrology (Mosquito Ditching)

(A) Exposure Pathway

See Sharp-tailed Sparrow profile

(B) Evidence

Mosquito ditching reduces the abundance of cordgrass, an essential habitat feature for breeding willets, by draining standing water on the marsh surface (Benoit and Askins 1999, Lowther et al. 2001). Drier, ditched marshes may not provide quality nesting habitat or a sufficient abundance of invertebrates and therefore are less suitable for willets (Lowther et al. 2001). In addition, the lower water levels and the resulting invasion of bushes and brackish plants along ditch banks increases predators' access to the marsh (Post and Greenlaw 1994).

3.1.6 Mercury, Non-Point Source Pollution

See Sharp-tailed Sparrow profile

3.2 Sources of Information

Information on threats to willets was obtained from a literature review, New Hampshire Coastal Program, NHHB, and Biodiversity Research Institute in Gorham, Maine.

3.3 Extent and Quality of Data

On a regional level, threats to willets have gained significant attention from researchers and managers, but in New Hampshire research is lacking. Effects of mosquito ditching, habitat loss, and invasive plants on the occurrence and abundance of willets have received some study in southern New England.

3.4 Threat Assessment Research

Threats to willet populations have not been documented in New Hampshire. Research priorities for threat assessment include population trends, effects of wetland restoration, and impacts of increased human disturbance near marsh habitat (e.g., increased road density and noise).

Research is needed to determine the effects of methylmercury on willet populations in New Hampshire. Methylmercury has become a major ecological and human health concern in the region. The Biodiversity Research Institute is investigating the effects of mercury on salt marsh birds in New England, which can provide a basis for conservation actions.

ELEMENT 4: CONSERVATION ACTIONS

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

See Salt Marshes habitat profile and Saltmarsh Sharp-tailed Sparrow profile

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

See Salt Marshes habitat profile and Saltmarsh Sharp-tailed Sparrow profile

ELEMENT 5: REFERENCES

5.1 Literature

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5.2 Data Sources

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

Table 1. New Hampshire salt marshes with willet populations during the 2004 breeding season (McElroy and Babbitt, unpublished data).

Distribution of Willet in New Hampshire

Distribution
■ Known
■ Potential



0 10 20 40 Miles

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.

