Species Status Assessment

Common Name:	Willet	**Date Updated:**	1/21/2025
Scientific Name:	*Tringa semipalmata*	**Updated By:**	Tgh, V. Bonaiuto
Class:	Aves		
Family:	Scolopacidae		

Species Synopsis

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

Formerly within the genus *Catoptrophorus*, the willet was recently reclassified into the genus *Tringa*. There are two disjunct breeding populations; *T. s. semipalmata* is the Eastern subspecies and *T. s. inornata* is the Western subspecies. Both occur in New York, but only the eastern subspecies breeds in the state while the western subspecies is present during migration. The eastern subspecies breeds along the Atlantic and Gulf coasts, as far north as the maritime provinces. They also breed as far south as the Tamaulipas, Mexico with local populations in the Caribbean (Oswald et al. 2016).

Prized for both its eggs and its meat in the late 1800s and early 1900s, the willet was hunted almost to extirpation until it received protection under the Migratory Bird Treaty Act in 1918. Though breeding was suspected in New York by early ornithologists, the first nests were not confirmed in New York until 1966 (Davis 1968). The distribution on the Coastal Lowlands and in other northeastern states has steadily increased since that time. Willets are currently secure but may be susceptible to loss of salt marsh habitat due to anticipated sea level changes.

I. Status

a. Current legal protected Status

i. Federal: Unlisted **Candidate:**

ii. New York: Unlisted: protected native

b. Natural Heritage Program

i. Global: G5

ii. New York: S3B **Tracked by NYNHP? No**

Other Ranks:

New York 2025 SGCN status: Species of Greatest Conservation Need
COSEWIC: Not listed in Canada
IUCN Red List: Least Concern
Northeast Regional SGCN: Watchlist [Assessment Priority]

Status Discussion:

Willet is a common breeder on the south shore of Long Island and a common migrant all along the coast. It is rare inland, where it occurs as a migrant on the Great Lakes.

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status or S-Rank	SGCN?
North America	Yes	Declining	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	S3B	Yes
Connecticut	Yes	Unknown	Unknown	Unknown	S4B	Yes
Massachusetts	Yes	Increasing	Unknown	BBS 1966-2022 trend	S3B,S3N	Yes
New Jersey	Yes	Unknown	Unknown	BBS 1966-2022 not credible trend	S4B,S4N	Yes
Pennsylvania	Yes	Unknown	Unknown	Unknown	S2M	No

Region	Present?	Abundance	Distribution	Time Frame	Listing status or S-Rank	SGCN?
Vermont	No	Unknown	-	Unknown		No
Ontario	Yes	Unknown	Unknown	Unknown	S2M	
Quebec	Yes	Unknown	Unknown	Unknown	S3B	

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. Willet is one of SHARP's six focal species being monitored in detailed demographic studies along the Atlantic Coast (although not currently including NY) and is considered a secondary focal species for SHARP's call-broadcast surveys for secretive marsh birds at sites on Long Island (SHARP 2011).

Trends Discussion

Willets were hunted to near extinction in the late 1800s and early 1900s, disappearing from the northern edges of the breeding range on the Atlantic Coast. Following the passage of the Migratory Bird Treaty Act in 1918, populations rebounded, returning to New Jersey in the 1950s, New York in the 1960s, Maine and Connecticut in the 1970s, and New Hampshire and Rhode Island in the 1980s. Connecticut listed willet at Endangered on its first state list, reclassified it to Threatened in 1992, to Special Concern in 1998, and ultimately removed it from the list as the population grew; it is now a SGCN in the state.

A population estimate study conducted from 2011-2012 estimated a population of 117,000 Willets in the northeast states, with a majority residing in coastal New Jersey (Wiest et al. 2016).

Over the last three generations the global population is estimated to have declined by 6-15% (Birdlife International 2024).

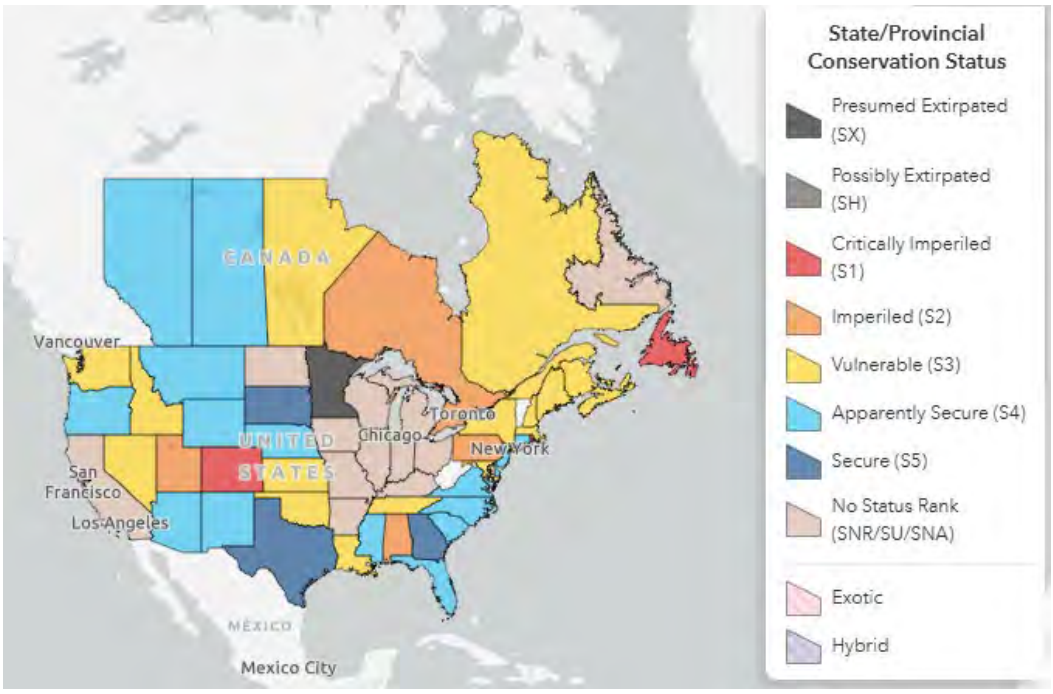

Figure 1. Conservation status of willet in North America (NatureServe 2024).

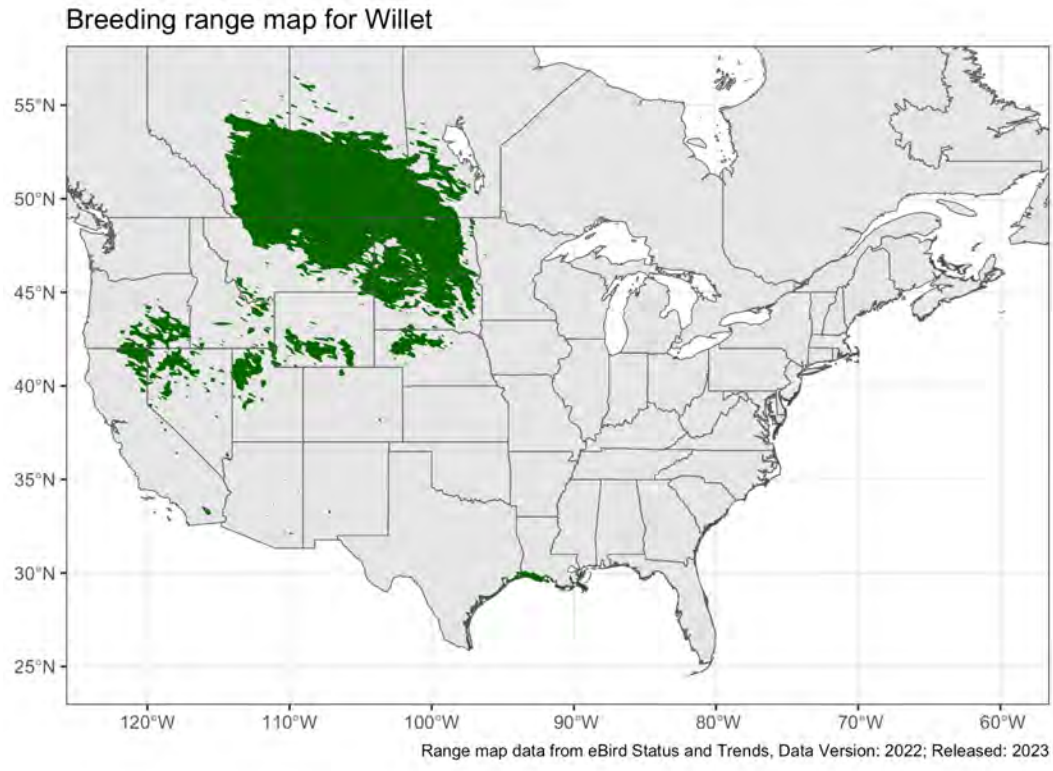

Figure 2. Breeding range of willet (eBird).

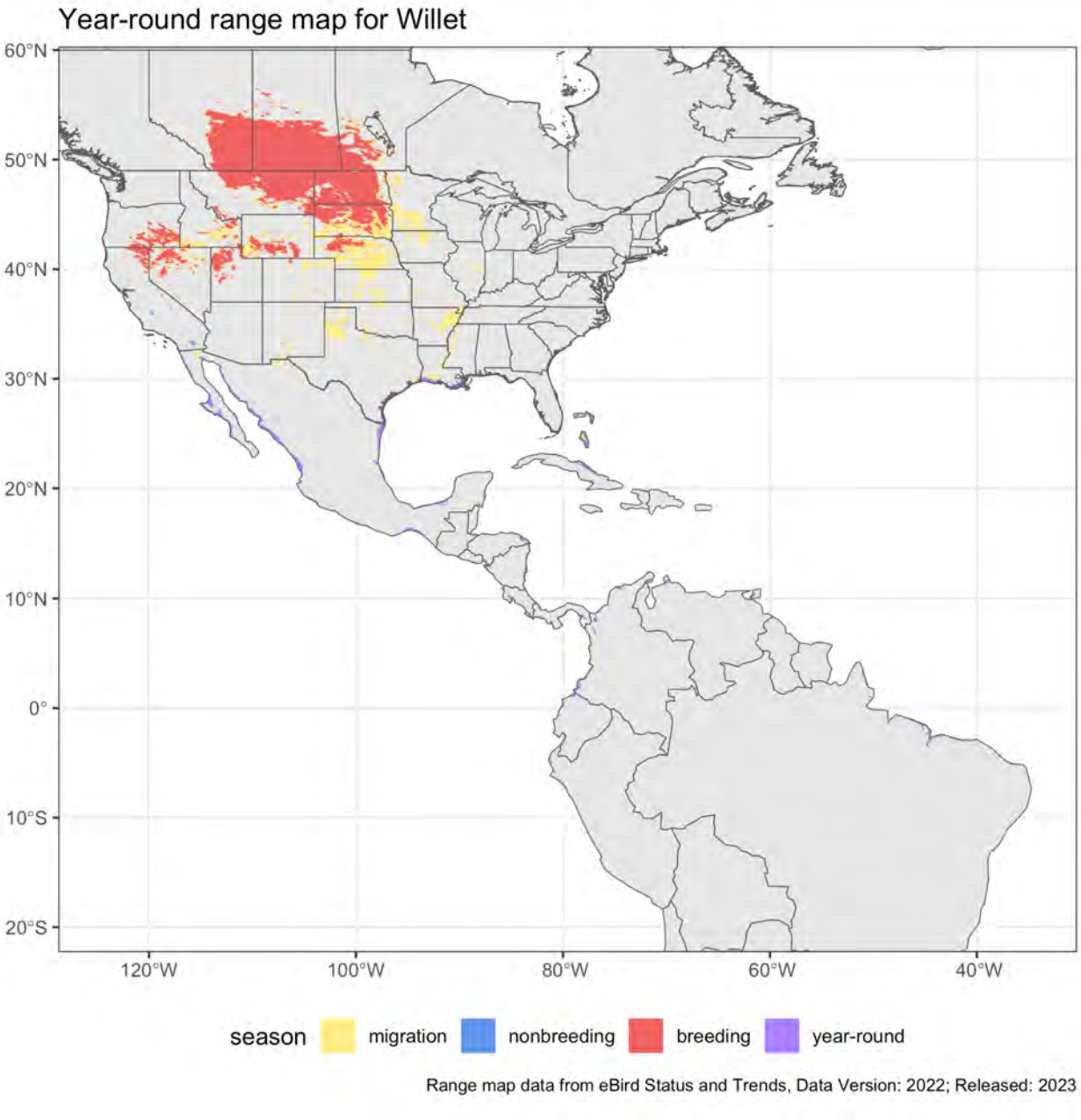

Figure 3. Year-round range of willet (eBird).

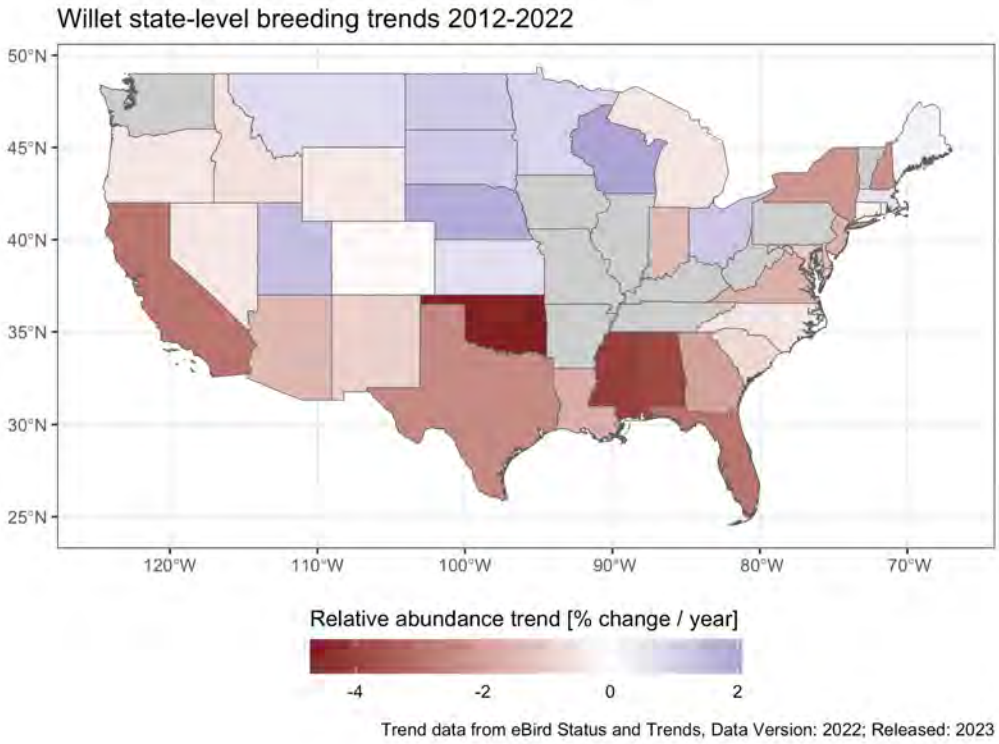

Figure 4. Breeding trends, by state, for willet (eBird).

III. New York Rarity

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

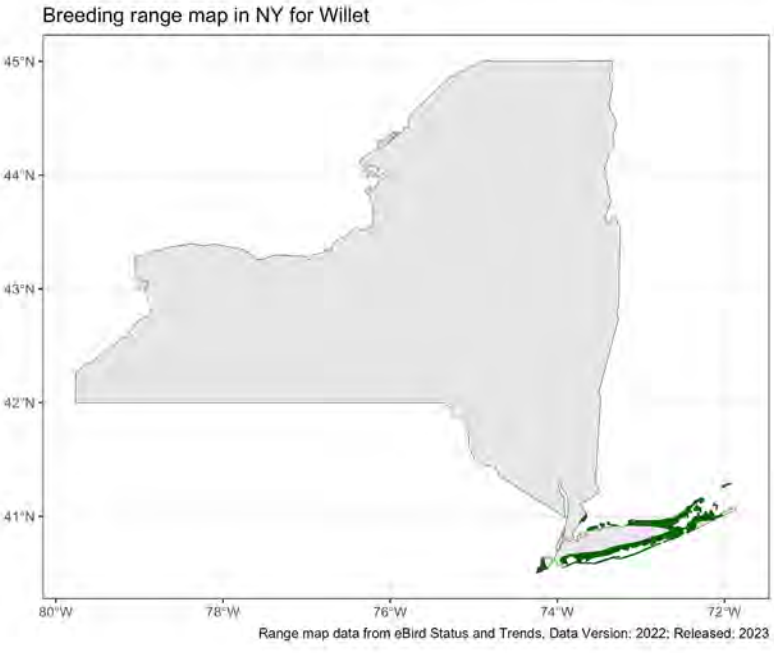

Figure 5. NYS breeding range of willet (eBird).

Details of historic and current occurrence:

Willet was first recorded breeding in New York in 1966 (Davis 1968). By 1983 an estimated 150 pairs bred at the Jones Inlet salt marshes.

The first Breeding Bird Atlas (BBA) (1980-85) documented occupancy in 43 blocks, 0.8% of the survey blocks statewide (Andrle and Carroll 1988). The second BBA (2000-05) documented occupancy in 76 blocks, 1.4% 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, willet has been documented in 67 priority blocks, 1.2% 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, 0.39 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 19 of 30.

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

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: Sand/dune, Grassland/herbaceous, TEMPORARY POOL, HERBACEOUS WETLAND, Riparian, Shallow water, Herbaceous wetland, Tidal flat/shore

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/ Increase
Yes	No	Declining	Since mid 1900s

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:

On Long Island this species prefers sand and mud flats and are frequently found w/ Greater Yellowlegs or godwits. Most NY nests are located in "beach-grass in sand on salt marsh island just back of the barrier beaches" (Bull 1974).

The willet uses marshes, tidal mudflats, beaches, lakes margins, mangroves, tidal channels, river mouths, coastal lagoons, sand or rocky shores, and, less frequently, open grassland (AOU 1983, Stiles and Skutch 1989). In western North America, they nest along marshy lake margins. In eastern North America, they nest along salt marshes. They will nest on the ground in open places, coastal marshes, beaches or islands; and inland in wet grasslands by lakes, shortgrass, or bare ground by water. Breeding requires large expanses of short, sparse grasslands for nesting and foraging, as well as wetland complexes for foraging (Stewart 1975; Weber 1978; Kantrud and Steward 1984; Ryan and Renken 1987; Colwell and Oring 1998a, 1990; Kantrud and Higgins 1992; Prescott et al.1995). In both upland and wetland habitats, adults with broods use somewhat taller, denser grass cover than do breeding pairs during nesting (Ryan and Renken 1987). In North Dakota, uplands used by Willets had a thinner litter layer than surrounding areas (Renken 1983). They often nest near a conspicuous object such as a piece of wood, dried cattle dung, or a stone (Higgins et al. 1979, Kantrud and Higgins 1992). They prefer native grass to tame vegetation (Stewart 1975, Ryan and Renken 1987, Kantrud and Higgins 1992). They prefer pastures that are idle during the nesting season, and to a lesser extent actively grazed pasture, to other land-use types (Higgins et al. 1979, Ryan and Renken 1987, Kantrud and Higgins 1992). Although tilled lands usually are avoided (Weber 1978), nests have been reported in hayland and cropland, including small-grain, flax, and stubble fields (Higgins et al. 1979, Kantrud and Higgins 1992). In North Dakota, pairs nesting in native vegetation had higher hatching success than pairs nesting in cultivated fields (Higgins et al. 1979). In the prairie and aspen parkland regions of Alberta, mean number of birds/site was nonstatistically compared among several habitats (Prescott et al. 1995, Prescott 1997). In prairie, were most abundant in native mixed-grass, followed by coulee, upland shrub, planted cropland, and hayland (Prescott 1997). Coulee was defined as a valley containing an ephemeral creek or seepage that may contain other, undescribed, habitat types. Hayland was planted to grasses (species not given) or alfalfa (MEDICAGO SATIVA). In the uplands of aspen parkland, were most abundant in deferred native pastures grazed after July 15th, followed by idle native grassland, continuously grazed native parkland, and tame dense nesting cover (Prescott et al. 1995). They were not found in tame pasture, deferred tame pasture, idle tame uplands, idle tame grasslands, continuously grazed native grasslands, idle parkland, or native dense nesting cover. In wetlands, they avoid dense, emergent vegetation, preferring shallow-water areas with short, sparse shoreline vegetation (Ryan and Renken 1987, Colwell and Oring 1988a, Eldridge in prep.). Suitable wetlands range in salinity from fresh to saline, and vary widely in size and permanence (Stewart 1975, Kantrud and Stewart 1984, Ryan and Renken 1987, Prescott et al. 1995, Eldridge in prep.). In North Dakota, they were more common in alkali or permanent wetlands than in temporary, seasonal, or semipermanent wetlands (D. H. Johnson et al., unpubl. data). Shifts in wetland use occurs seasonally and during climatic extremes (Ryan and Renken 1987; Gratto-Trevor, in press). Semipermanent wetlands were used most often, but ephemeral, temporary, seasonal, and alkali ponds were preferred relative to their availability (Ryan and Renken 1987). Semipermanent wetlands were used later in the summer than other wetland types. Semipermanent and permanent wetlands were used during drought years.

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):

Territories are large and include both feeding and nesting areas. In North Dakota, mean territory size was 44.3 hectares (Ryan and Renken 1987). Nonbreeding: forages singly or small loose groups; gathers in large flocks to sleep or rest (Stiles and Skutch 1989).

From Lowther et al. (2020):

Willets first breed at two or three years of age. There is no estimate of lifetime reproductive success. One brood is reared per season. Annual reproductive success varies considerably between years depending upon abundance of predators. In a Virginia study, most losses were due to predation by raccoons, red foxes, feral dogs, and fish crows (Howe 1982). Productivity varies with number of extreme tides that occur during breeding period (Tompkins 1965, Howe 1982).

The annual adult survival rate is approximately 85% (Howe 1982). Survival from fledging to first year is unknown. The longevity record is 10 years, 3 months based on 33 recoveries of 2,058 willets banded 1955–1998 (Klimkiewicz 1997). Eastern willets exhibit strong fidelity to nesting and feeding territories (Tomkins 1965, Wilcox 1980, Howe 1982). They have a lifespan of up to 10 years.

Willets die in botulism outbreaks in most years; the importance of botulism, pesticides, and parasites in adult mortality is unknown.

VI. Threat

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
7. Natural System Modifications	7.2 Dams & Water Management/Use (ditching, draining, mosquito control)	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
7. Natural System Modifications	7.3 Other Ecosystem Modifications (Erosion)	-	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 (Phragmites)	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.2 Problematic Native Plants & Animals (predators)	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.2 Industrial & Military Effluents	9.2.1 Oil spills	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.5 Air-Borne Pollutants (mercury)	-	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.
11. Climate Change	11.5 Storms & Severe Weather	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Table 1. Threats to willet.

Loss of saltmarsh habitat has the greatest potential to affect willet populations. Mosquito-ditching results in replacement of natural grass associations with woody vegetation and reduced invertebrate prey of shorebirds (Bourn and Cottam 1950). Draining and impoundment of salt marshes in Maritime Provinces reduced habitat quality in some locales (Erskine 1992). As coastal nesters, willets are susceptible to habitat loss due to rising ocean levels, as well as to storms of increasing intensity and frequency. Willet 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).

Arsenic, selenium, mercury, DDE, and other organochlorines are potential contaminants that are associated with agricultural runoff or historical practices and that accumulate in coastal sediments. Mercury has exposure has been well-documented for other wetland obligates including seaside sparrow and saltmarsh sparrow (Osborne et al. 2011).

Habitat loss due to erosion and development of shoreline habitat are also threats to salt marsh breeding birds. Habitat conversion by the invasive Phragmites reed is occurring in many areas of high marsh and along the edges of many interior mosquito control ditches. Loss and degradation of grasslands from development impacts critical habitat for willet breeding (BirdLife International 2024).

While this species is protected by the Migratory Bird Treaty Act in New York, hunting of eastern willets while they overwinter outside of the US does take place (Huysman et al. 2022). Willets breeding on the Atlantic Coast face a greater risk from hunting, as they migrate across the Caribbean to winter in South America (BirdLife International 2024, Watts and Turrin 2016)

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.

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

Action Category	Action	Description
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 and 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 2. Recommended conservation actions for willet.

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

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.

American Ornithologists' Union (AOU). 2006. Forty-seventh supplement to the American Ornithologists' Union Check-list of North American Birds. The Auk 123(3):1926-936.

Banks, R. C., and M. R. Browning. 1995. Comments on the status of revived old names for some North American birds. Auk 112:633-648.

Bent, A.C. 1929. Life histories of North American shorebirds (Part II). U.S. Natl. Mus. Bull. 146. Washington, D.C.

Bourn, W. S. and C. Cottam. 1950. Some biological effects of ditching tide water marshes. Res. Rep. no. 19. Fish Wildl. Serv., U.S. Dep. Int. Washington, D.C.

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

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

Davis, T.H. 1968. Willet nesting on Long Island. Wilson Bulletin 80:330.

Erskine, A. J. 1992. Atlas of breeding birds of the Maritime Provinces. Nimbus Publ. and Nova Scotia Mus. Halifax.

Harrison, C. 1978. A Field Guide to the Nests, Eggs and Nestlings of North American Birds. Collins, Cleveland, Ohio.

Hayman, P., J. Marchant, and T. Prater. 1986. Shorebirds: an identification guide to the waders of the world. Houghton Mifflin Co., Boston.

Hilty, S.L. and W. L. Brown. 1986. A Guide to the Birds of Colombia. Princeton University Press, Princeton, USA. 836 pp.

Howe, M. A. 1982. Social organization in a nesting population of Eastern Willets (*Catoptrophorus semipalmatus*). Auk 99:88-102.

Huysman, A. E., Cooper, N. W., Smith, J. A., Haig, S. M., Heath, S. A., Johnson, L., ... & Marra, P. P. (2022). Strong migratory connectivity indicates Willets need subspecies-specific conservation strategies. *Ornithological Applications*, *124*(3), duac015.

Klimkiewicz, M. K. 1997. Longevity records of North American birds. Version 97.1. Patuxent Wildl. Res. Center, Bird Banding Lab. Laurel, MD. [Online.] http://www.pwrc.usgs.gov/bbl/homepage/longvrec.htm

Lowther, P. E., H. D. Douglas III, and C. L. Gratto-Trevor (2020). Willet (*Tringa semipalmata*), version 1.0. In Birds of the World (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.willet1.01

Morrison, R. I. G., and R. K. Ross. 1989. Atlas of Nearctic shorebirds on the coast of South America. Vols. 1 and 2. Canadian Wildl. Serv. Spec. Publ. 325 pp.

NatureServe. 2025. NatureServe Explorer. Page last published 1/3/25. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100605/Tringa_semipalmata. Accessed January 10, 2024.

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.

Osborne, C. E, D. C. Evers, M. Duron, N. Schoch, D. Yates, D. Buck, O. P. Lane, and J. Franklin. 2011. Mercury Contamination within Terrestrial Ecosystems in New England and Mid-Atlantic States: Profiles of Soil, Invertebrates, Songbirds, and Bats. Report BRI 2011-09. Submitted to The Nature Conservancy – Eastern New York Chapter. Biodiversity Research Institute, Gorham, Maine.

Oswald, J. A., Harvey, M. G., Remsen, R. C., Foxworth, D. U., Cardiff, S. W., Dittmann, D. L., ... & Brumfield, R. T. (2016). Willet be one species or two? A genomic view of the evolutionary history of Tringa semipalmata. *The Auk: Ornithological Advances*, *133*(4), 593-614.

Raffaele, H. A. 1983a. A guide to the birds of Puerto Rico and the Virgin Islands. Fondo Educativo Interamericano, San Juan, Puerto Rico. 255 pp.

Robert, M., R. McNeil, and A. Leduc. 1989. Conditions and significance of night feeding in shorebirds and other water birds in a tropical lagoon. Auk 106:94-101.

Rompre, G., and R. McNeil. 1994. Seasonal changes in day and night foraging of willets in northeastern Venezuela. Condor 96:734-738.

Schlesinger, M.D., J.D. Corser, K.A. Perkins, and E.L. White. 2011. Vulnerability of at-risk species to climate change in New York. New York Natural Heritage Program, Albany, NY.

Stiles, F. G. and A. F. Skutch. 1989. A guide to the birds of Costa Rica. Cornell University Press, Ithaca, New York, USA. 511 pp.

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

Tomkins, I. R. 1965. The Willets of Georgia and South Carolina. Wilson Bull. 77:151-167.

Wiest, W. A., Correll, M. D., Olsen, B. J., Elphick, C. S., Hodgman, T. P., Curson, D. R., & Shriver, W. G. (2016). Population estimates for tidal marsh birds of high conservation concern in the northeastern USA from a design-based survey. *The Condor*, *118*(2), 274–288. https://www.jstor.org/stable/90009316

Wilcox, L. 1980. Observations on the life history of willets on Long Island, NY. Wilson Bulletin 92:253-58.

Experts Consulted: Katherine Yard, NYSDEC