

Species Status Assessment

Common Name	sand dune willow	Date Updated:	2024-02-28
Scientific Name	<i>Salix cordata</i>	Updated By:	Rachael A. Renzi
Family	Salicaceae		

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

Sand dune willow is a perennial shrub in the willow family. It is one of 25 species in the genus *Salix* in NY, but one of 19 considered native to the state (Werier et al. 2023). *Salix cordata* grows only along shorelines and dune systems from Newfoundland, eastern Quebec, Nova Scotia, to northern Maine, and westward around the Great Lakes to Illinois, Wisconsin, and northern Michigan, and northward to the Hudson Bay (NatureServe 2023). In New York, it is restricted to a handful of locations on Lake Ontario (NYNHP 2023, 2024). Although most of the populations are on protected land, conservation of the dune habitat remains essential to conserve this species. At one population, supplemental planting with offspring from the same location has helped to alleviate pressure from beachfront disturbance. Overall, the populations appear to be stable, but continued research along with consistent quantitative surveys at all populations are needed.

I. Status

a. Current legal protected Status

i. Federal:		Candidate:	
ii. New York:	<u>Threatened</u>		

b. Natural Heritage Program

i. Global:	<u>G4</u>		
ii. New York:	<u>S2</u>	Tracked by NYNHP?	On Active Tracking List

Other Ranks:

COSEWIC: Not listed in Canada
IUCN Red List: Not assessed by IUCN Red List

Status Discussion:

Salix cordata is Endangered in New York (Ring 2023). There are six known populations of *Salix cordata* in NY within a very limited range and habitat and one historic population (NYNHP

2023). Few to no new populations are expected since the areas of potential habitat have been well surveyed (NYNHP 2023). There are minimal threats from development and recreation activities, as many of the populations are within protected landscapes (NYNHP 2023).

II. Abundance and Distribution

Region	Present?	Abundance	Distribution	Time Frame	Listing status or S-Rank	SGCN?
North America	Yes	Unknown	Unknown	Unknown		
Northeastern US	Yes	Unknown	Unknown	Unknown		
New York	Yes	Unknown	Unknown	Unknown	T	
Connecticut	No	-	-	-		
Massachusetts	No	-	-	-		
New Jersey	Yes	Unknown	Unknown	Unknown	SNR	
Pennsylvania	Yes	Unknown	Unknown	Unknown	SNR	
Vermont	No	-	-	-		
Ontario	Yes	Unknown	Unknown	Unknown	S4	
Quebec	No	-	-	-		

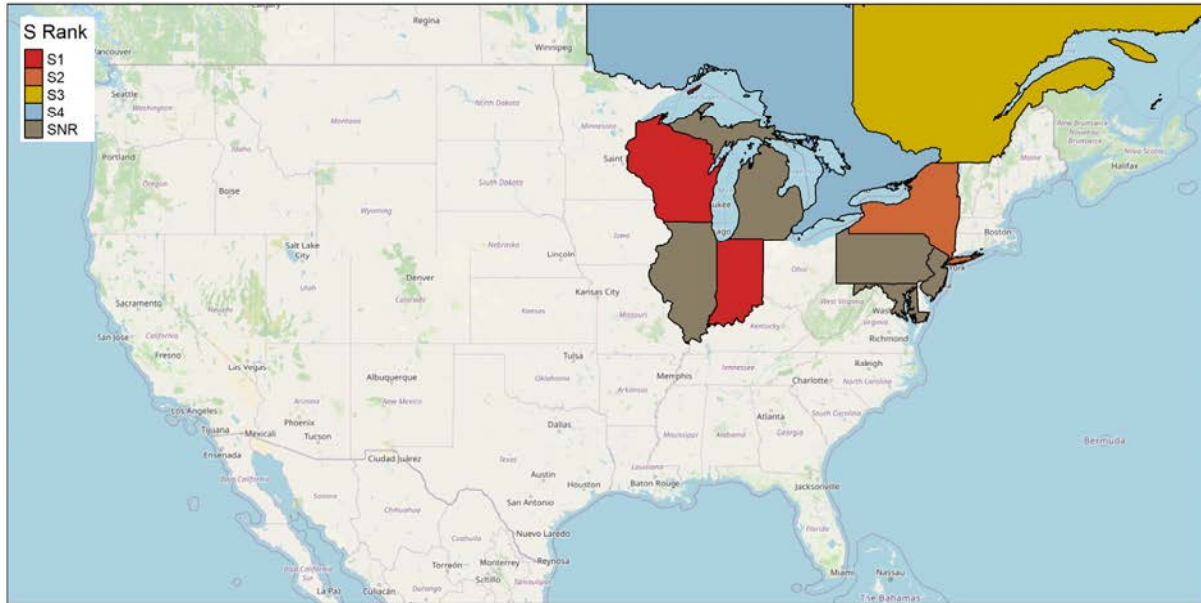


Figure 1. *Salix cordata* North American distribution.

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

III. NY Rarity and Trends

Trends Discussion

Salix cordata was only ever known from its present locations in NY and these populations have only seen small fluctuations for many years (NYNHP 2023, 2024). There are seven populations, counting the historic occurrence, and no more are expected (NYNHP 2023, 2024). The number of plants at each location ranges from 100 ramets to over 100,000 ramets (NYNHP 2023). It appears that two of the populations have seen a decrease in the number of genets over the years, but surveys with consistent and accurate counts are needed to track populations in the future (NYNHP 2023). Overall, the populations seem to be doing well and little change is expected in the foreseeable future if viable habitat remains.

Details of historic and current occurrence

This shrub is limited to small clonal colonies along the eastern dunes and beaches of Lake Ontario (NYNHP 2023, 2024). None of the populations have become extirpated (NYNHP 2023). One of the populations is augmented by plantings with material sourced from the same location (NYNHP 2023). This shrub can be found along shorelines and dune systems from Newfoundland, eastern Quebec, Nova Scotia, to northern Maine, and westward around the Great Lakes to Illinois, Wisconsin, and northern Michigan, and northward to the Hudson Bay (NatureServe 2023).

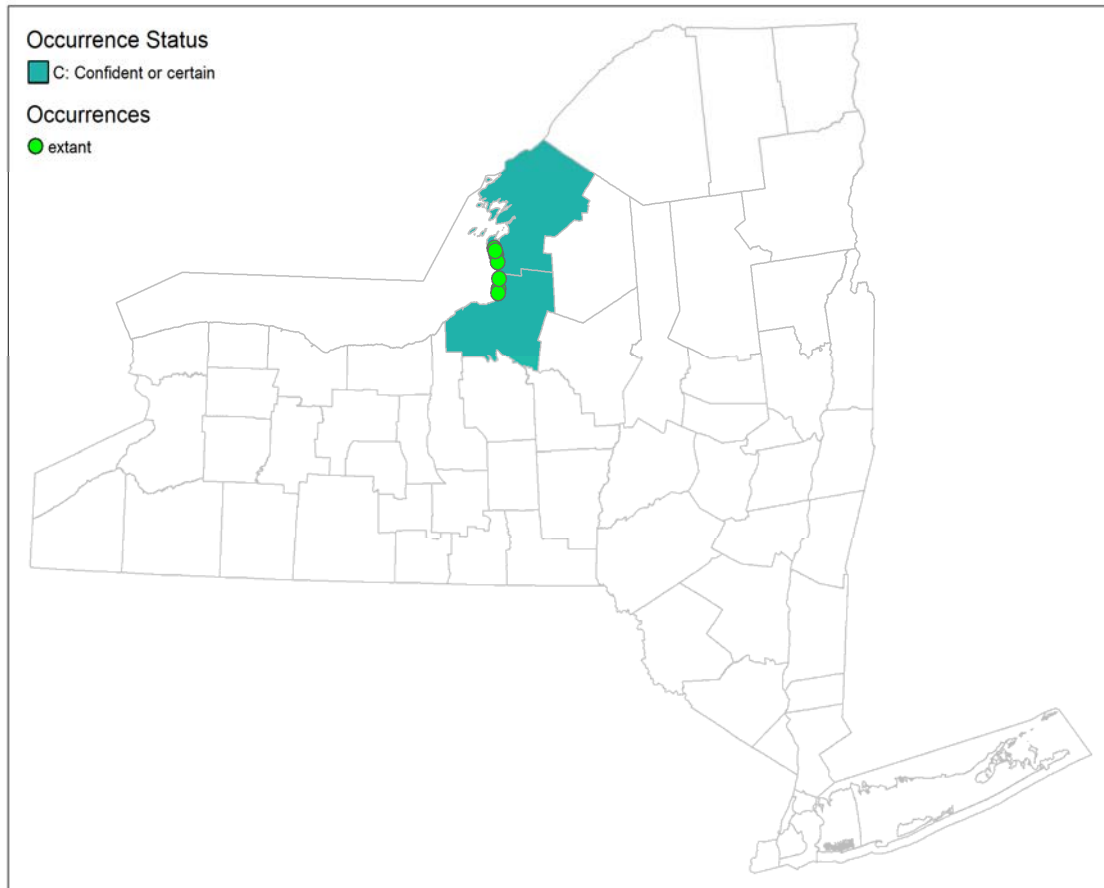


Figure 2. NYS distribution for *Salix cordata*.

Table 1. Number of records (element occurrences) of *Salix cordata* grouped by the dates known to be extant (the years spanning first observation to last observation) and the number and percent of total of USGS 7.5 minute map quadrangles these observations fall within for New York State.

Years	# of Records	# of distinct quads	% of quads in State
Pre-1995	6	3	0.3
1995-2004	4	3	0.3
2005-2014	3	2	0.2
2015-2023	2	2	0.2

Monitoring in New York

Five of the six extant populations have been visited at least three times, with the latest visits ranging from 1994 to 2023 (NYNHP 2023). Three populations occur at least partially on state park land, which are surveyed on a ten-year cycle (NYNHP 2023). Three population occur at least partially on DEC owned land, and two occur partially on privately-owned preserves (NYNHP 2023).

IV. Primary Habitat or Community Type (from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):

Northeastern Habitat Classification Macrogroup: Coastal Grassland and Shrubland.

NY Ecological Communities: Great Lakes dunes, Sand beach (Edinger et al. 2014)

Habitat or Community Type Trend in New York

Declining: **Stable:** **Increasing:** **Unknown:** ✓
Time Frame of Decline/Increase:
Habitat Specialist **Yes:** ✓ **No:**

Habitat Discussion:

Throughout its North American range, the shrub is found on sandy, gravelly, and alluvial shores, riverbanks, and dunes and beaches of the Great Lakes (Gleason & Cronquist 1991; Soper 1982; Fernald 1950). *Salix cordata* is restricted to the sand beaches and dunes along the eastern shore of Lake Ontario, in dry to mesic soils (NYNHP 2024; Werier et al, 2023). Likewise, in Michigan, it is almost completely restricted to sandy shores and dunes along the Great Lakes (Voss 1985).

V. Species Demographics and Life History (include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):

Salix cordata is clonal perennial shrub. It can reproduce vegetatively from dormant stem cuttings (Mosseler & Major 2023). The shrubs produce flowering catkins after one full growing season, usually early in spring, at the beginning of the second growing season (Mosseler & Major 2023). It is pollinated by Apoidea, usually *Adrena*, bees, as well as *Colletidae* (Mosseler et al. 2020). It is a host plant for the sand willow flea beetle (*Altica subplicata*), which feeds on the leaves (Bach 1994). Their herbivory decreases growth of the willows and increases mortality, which, in turn, affects dune succession by increasing habitat availability for herbaceous species (Bach 1994). More research is needed on the germination of *S. cordata*, but seeds of willow species are generally small and light, with very short periods of viability (TPD 2024). The seeds germinate in open, disturbed soils (TPD 2024). However, the rate of seedling recruitment in NY is unknown. In greenhouse conditions, plants with multiple leaves and stems can be grown from seed in a couple of months (Evans 2022).

Kuzovkina et al.'s 2004 study showed that *Salix cordata* can tolerate compacted soil; biomass even increases under compacted soil conditions. However, *Salix cordata* does not tolerate flooded conditions very well, which aligns with its preference for well aerated soils (Kuzovkina et al. 2004). One study found *S. cordata* to be highly productive on disturbed areas (Mosseler & Major 2023). Dech & Maun (2006) found that *Salix cordata* responds to burial by allocating resources from original roots to vertical shoot and adventitious root production, a plastic response indicating a tolerance for burial. It is unknown how long a genet of the sand dune willow can live, but genets of *Salix herbacea* have been estimated to be at least 2000 years old (Centenaro et al. 2023). More research on the longevity of this species is needed.

Table 2. Phenology of *Salix cordata* in New York State (NYNHP 2023).

Phenology	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Flowering					■								
Fruiting						■							
Vegetative					■								

VI. Threats

There may be some problems with off road vehicles damaging plants. More research is needed on the relationship between *Salix cordata* growth and dune building processes.

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:

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

Conservation of the dune habitat by preventing damage from off road vehicles and allowing natural dune succession is needed.

Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection) -

<https://www.iucnredlist.org/resources/conservation-actions-classification-scheme>

Table 3. Recommended conservation actions for *Salix cordata*.

Conservation Actions	
Action Category	Action
Land/water protection	1.1. Site/area protection
Land/water protection	1.2. Resource & habitat protection
Land/water management	2.1. Site/area management
Land/water management	2.2. Invasive/problematic species control
Land/water management	2.3. Habitat & natural process restoration

VII. References

This SSA drew heavily from these resources:

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