

Species Status Assessment

| | | | |
|------------------------|------------------------|----------------------|-----------------|
| Common Name | broom crowberry | Date Updated: | 2023-12-20 |
| Scientific Name | <i>Corema conradii</i> | Updated By: | Kyle J. Webster |
| Family | Ericaceae | | |

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

Broom crowberry (*Corema conradii*) is a low growing evergreen shrub in the heath family (Ericaceae). It is endemic to the northeastern coastal plain of North America with a range stretching from the New Jersey coast north to Prince Edward Island in Canada (NatureServe 2023). *Corema conradii* is the only species of *Corema* in New York (Werier et al. 2023).

In New York, *Corema conradii* occurs on a pitch pine-oak heath rocky summit along ledges exposed to high winds, growing from cracks siliceous rock or in areas with an extremely thin layer of duff and mineral soil (NYNHP 2023). It is known from only one population in the Shawangunk Mountains of Ulster County. This population represents the only non-coastal population known globally (NatureServe 2023, NYNHP 2023).

The *Corema conradii* population appears to be declining due to increased trampling from recreational hiking (NYNHP 2023). A lack of fire may be limiting the recruitment of juvenile plants, causing the population to decline (NYNHP 2023). In the long-term, the population has declined and recovered multiple times since 1881, including a concerning decline from the 1950s through the 1960s (Huth and Smiley 1982). More regular monitoring and demographic studies are needed to identify conservation strategies and better understand the short-term trends of this population.

I. Status

a. Current legal protected Status

| | | |
|----------------------|-------------------|-------------------|
| i. Federal: | Not Listed | Candidate: |
| ii. New York: | <u>Endangered</u> | |

b. Natural Heritage Program

| | | | |
|----------------------|-----------|--------------------------|-------------------------|
| i. Global: | <u>G4</u> | | |
| ii. New York: | <u>S1</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:

Corema conradii is Endangered in NY (Ring 2023). There is only one extant population in the state and it represents the only naturally occurring non-coastal site globally (NYNHP 2023, NatureServe 2023, Werier et al 2023). There is one historical report from Long Island, but numerous searches for it have proved unsuccessful. Since 1881 botanists and naturalists alike have been visiting the *Corema conradii* population in the Shawangunk Mountains. Despite this search effort no other location of *Corema conradii* has been found over the last 140 years.

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 | E | - |
| Connecticut | No | - | - | - | | - |
| Massachusetts | Yes | Unknown | Unknown | Unknown | S3 | - |
| New Jersey | Yes | Unknown | Unknown | Unknown | S3 | - |
| Pennsylvania | No | - | - | - | - | - |
| Vermont | No | - | - | - | - | - |
| Ontario | No | - | - | - | - | - |
| Quebec | No | - | - | - | - | - |

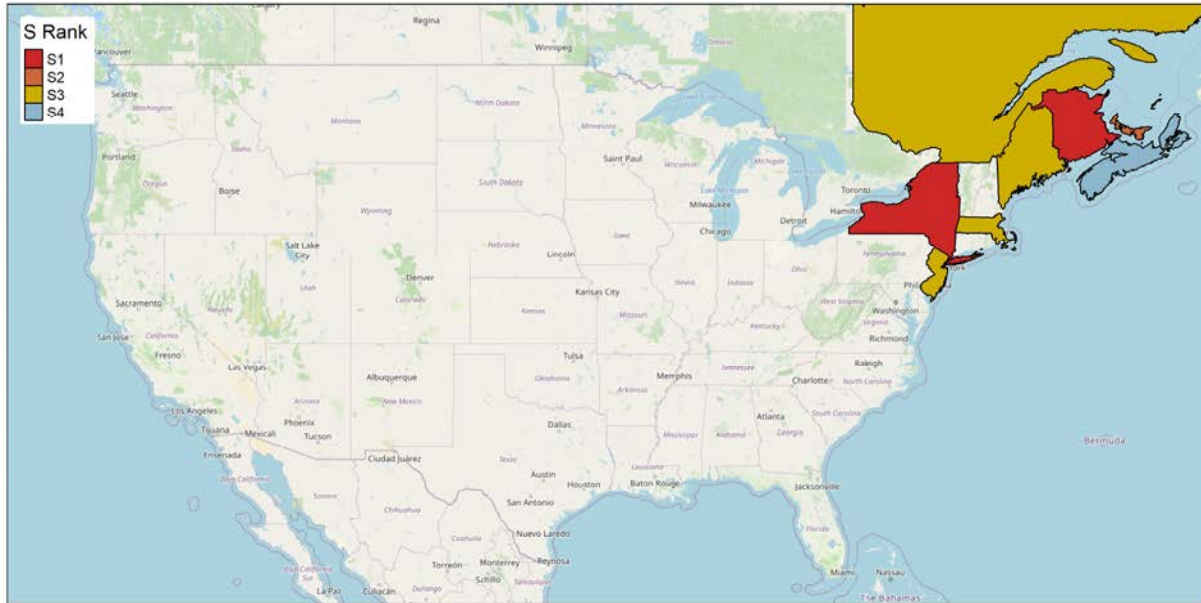


Figure 11: *Corema conradii* North American distribution.

| 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

Corema conradii appears to be declining due to increased trampling from recreational hiking (NYNHP 2023). A lack of fire in the habitat may be limiting the recruitment of juvenile plants, causing the population to decline (NYNHP 2023). In the long-term, the population has declined and recovered multiple times since 1881, including a concerning decline from the 1950s through the 1960s (Huth and Smiley 1982). The decline was largely attributed to increased deer browse pressure but may have also been influenced by an historic drought (Huth and Smiley 1982, NYNHP 2023). There was a report of a historical population on Long Island (Redfield 1884), but it has not been found despite being surveyed for and is likely extirpated (NYNHP 2023). More monitoring and demographic studies are needed to understand the short-term trends of *Corema conradii* in New York.

Details of historic and current occurrence

In New York, *Corema conradii* has only ever been confirmed from one population in the Shawangunk Mountains of Ulster County (Huth and Smiley 1982, NYNHP 2023, Werier et al. 2023). While surveys of potential habitat have been conducted, no additional populations have been found. There was one report of a population in Suffolk County on Long Island, made by Redfield (1884), but no specimens were preserved and no plants have been found despite surveys for it (NYNHP 2023). There are approximately 600-700 individuals known from New York (NYNHP 2023).

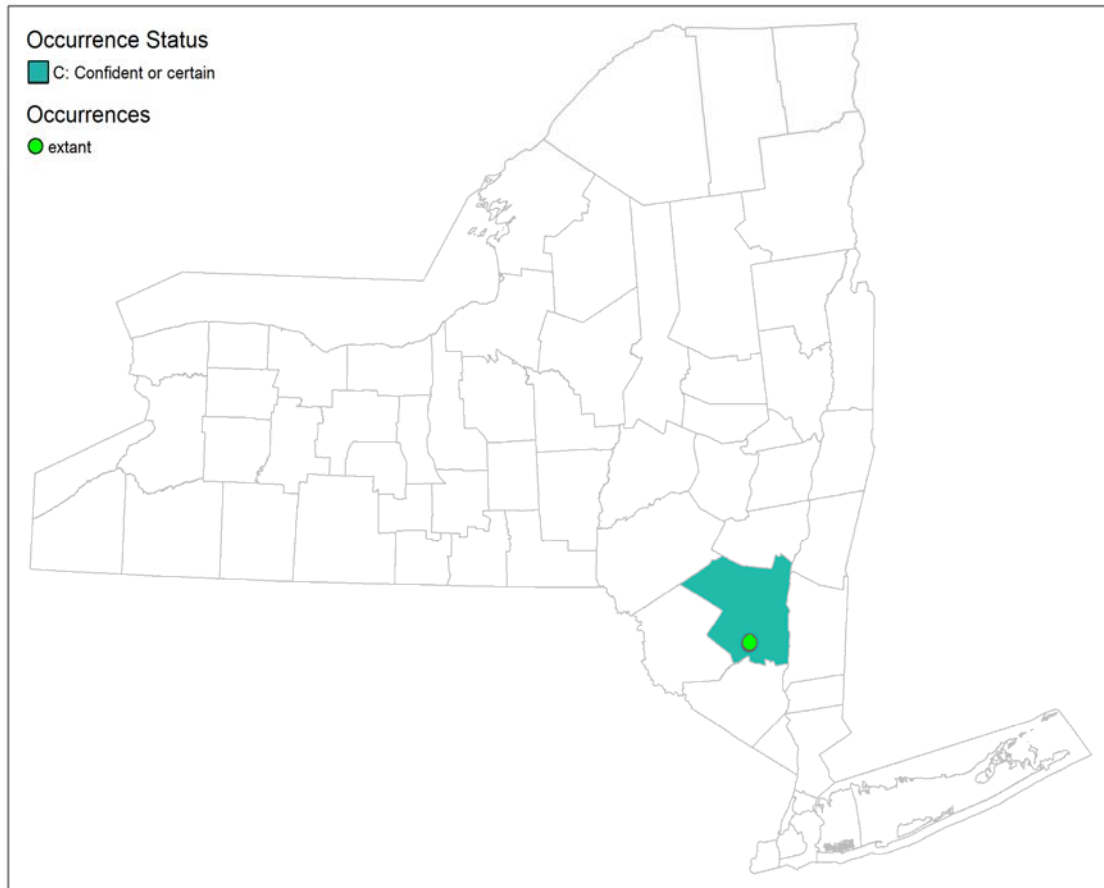


Figure 22: NYS distribution of *Corema conradii*.

Table 1. Number of records (element occurrences) of *Corema conradii* 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 | 2 | 1 | 0.1 |
| 1995-2004 | 2 | 1 | 0.1 |
| 2005-2014 | 2 | 1 | 0.1 |
| 2015-2023 | 0 | 0 | 0.0 |

Monitoring in New York

There is one extant population known statewide. It occurs on NYS Park lands and is monitored on a ten-year rotation, however no consistent monitoring or demographic studies have been conducted. The population has been variously visited by botanists and naturalists alike for the last 140 years (Huth and Smiley 1982, NYNHP 2023).

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

NatureServe broad habitat types: Shrubland/chaparral, Woodland - Mixed, Woodland - Conifer, Sand/dune

NY Natural Heritage Communities: Pitch pine-oak-heath rocky summit.

Habitat or Community Type Trend in New York

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

Habitat Discussion:

The population in New York occurs in the Shawangunk Mountains and is the only inland population known globally. The plants there occur in a pitch pine-oak heath rocky summit along ledges exposed to high winds, growing from cracks siliceous rock or in areas with an extremely thin layer of duff and mineral soil (NYNHP 2023). It occurs with *Gaylussacia baccata*, *Vaccinium pallidum*, *Aronia arbutifolia*, *Carex tonsa*, *Kalmia angustifolia*, *Kalmia latifolia*, *Pinus rigida*, *Tsuga canadensis*, *Vaccinium angustifolium*; immediate associated species: *Betula populifolia*, *Pinus rigida*, *Pinus strobus*, *Quercus ilicifolia*, *Quercus montana*, *Quercus rubra*, *Pteridium aquilinum* (NYNHP 2023).

Elsewhere in its range *Corema conradii* occurs on sandy soil (Gleason and Cronquist 1991); sandy or rocky soil; pine barrens (Newcomb 1977); sandy soils or rocky granite and igneous bluffs on coastal mountains between patches of *Empetrum nigrum*, *Pinus rigida*, *P. strobus*, or stunted *Quercus*. (Harshberger, 1916; Norton, 1913); Dunes, openings in pine barrens (Weakly 2022); sandy or rock soils, often near the coast (Haines and Vining 1998).

The disjunct populations throughout the range of *Corema conradii* are thought to be a result of unequal depression of the coastline during post-glacial times. These depressions caused the formation of islands where disjunct populations were preserved (Harshberger 1916).

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):

Corema conradii is a dioecious creeping evergreen shrub, with populations generally consisting of separate male and female plants. In New York, the wind pollinated flowers bloom in late April to early May (NYNHP 2023). Some plants have been found with both staminate and pistillate flowers on the same branches (Huth and Smiley 1982). The frequency of male, female, and bisexual individuals in *Corema conradii* populations needs further study.

After pollination, the pistillate flowers on female plants develop into a dry berry that splits open to reveal three seeds with a white fleshy elaiosome (Gleason and Cronquist 1991, Native Plant Trust 2024, NYNHP 2023). The elaiosome presumably aids the plants dispersal via ants, though this is not confirmed. Dunwiddie (1990) observed *Aphaenogaster rudis* ants collecting fruits with elaiosomes but did not track seeds to see if they later germinated.

Tests of seed viability resulted in very low germination rates. Nicholson and Alexander (undated) collected seeds from Massachusetts and Maine populations and found that with no pretreatment only 7.3% of seeds germinated. Cold stratification and scarification increased the germination rates; however, heat treatments had no effect (Nicholson and Alexander undated). This has confused the understanding of germination factors as related ericaceous shrubs are stimulated by heat (Mallik and Gimingham 1985) and there are numerous observations of abundant *Corema conradii* seedlings appearing after fires (Dunwiddie 1990, Redfield 1889). Clearly more research regarding the germination of *Corema conradii* is needed.

Seedlings establish in open areas on thin soils where few other plants occur, developing into small mounds growing from the center outward (NYNHP 2023, Zaremba 1984). Individuals typically grow up to one meter wide and 25-40 cm tall (Zaremba 1984). Yellow-green leaves develop in spring which then mature to a dark-brown color, persisting through winter and senescing the following summer (Zaremba 1984). Stems on young plants can grow up to 8 cm a year, while older plants reach a maximum of 0.5 cm annually (Zaremba 1984). As a result of this growth pattern, older plants typically develop a ring with new growth around a center of leafless woody material (Zaremba 1984). *Corema conradii* has been observed establishing widely after fires which can lead to relatively even-aged stands (Zaremba 1984). Individual plants can live up to 50 years but typically begin senescing around 35 years (Zaremba 1984).

Mature plants are not tolerant of fire (Dunwiddie 1990, Zaremba 1984). However, fire plays a critical role in creating conditions for seed germination via the reduction of competitive ericaceous shrubs and exposure of mineral soils (Dunwiddie 1990). The frequency and intensity of fire needed to promote *Corema conradii* should be studied further.

Table 2. Phenology of *Corema conradii* in New York State (NYNHP 2023).

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

VI. Threats

The population in the Shawangunks is fairly remote, yet there has been increased hiking pressure over the last decade leading to trampled plants and disturbed habitat. The absence of fire allows blueberries, huckleberries, and other ericaceous shrubs to spread into its habitat, competing with adult plants and limiting germination. Continued disturbance along with the lack of fire may be limiting the establishment of juvenile plants, causing the population to age out and decline in numbers. Deer browsing continues to affect accessible plants.

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:

Visitation by hikers to the only known site should be controlled in order to limit trampling of the plants and the disturbance of seedling habitat. Regular prescribed fire should be implemented to reduce competition from other ericaceous shrubs and recruit juvenile plants into the population. Deer browse impacts should be evaluated.

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 *Corema conradii*.

| 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:

NatureServe. 2023. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. <http://www.natureserve.org/explorer>. [Accessed 12/14/2023].

New York Natural Heritage Program, State University of New York College of Environmental Science and Forestry. 2023. Element Occurrence and Element Dataset. Albany, New York. [Exported 12/14/2023].

New York Natural Heritage Program. 2024. Online Conservation Guide for *Corema conradii*. Available from: <https://guides.nynhp.org/broom-crowberry/>. Accessed [01/04/2024].

Werier, David, Kyle Webster, Troy Weldy, Andrew Nelson, Richard Mitchell, and Robert Ingalls. 2023 New York Flora Atlas. [S. M. Landry and K. N. Campbell (original application development), USF Water Institute. University of South Florida]. New York Flora Association, Albany, New York. [Accessed 11/21/2023].

Additional references:

Dunwiddie, P.W. 1990. Rare plants in coastal heathlands: Observations on *Corema conradii* (Empetraceae) and *Helianthemum dumosum* (Cistaceae). *Rhodora* 92: 22-26.

Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero (editors). 2014. *Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State.* New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

Fernald, M.L. 1950. *Gray's manual of botany. 8th edition.* D. Van Nostrand, New York. 1632 pp.

Flora of North America Editorial Committee. 2009. *Flora of North America, North of Mexico. Volume 8. Magnoliophyta: Paeoniaceae to Ericaceae.* Oxford University Press, New York. 624 pp.

Gleason, Henry A. and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada.* The New York Botanical Garden, Bronx, New York. 910 pp.

Harshberger, J. W. 1916. *The vegetation of the New Jersey Pine Barrens.* Reprinted 1970. Dover Publications, Inc., New York. 329 pp.

Holmgren, Noel. 1998. *The Illustrated Companion to Gleason and Cronquist's Manual. Illustrations of the Vascular Plants of Northeastern United States and Adjacent Canada.* The New York Botanical Garden, Bronx, New York.

Huth, P. and D. Smiley. 1982. *Chronology of Corema conradii in the Shawangunk Mountains—the only New York State location, 1881 - 1981.* Research Report. Mohonk Preserve, Inc

Mitchell, Richard S. and Gordon C. Tucker. 1997. *Revised Checklist of New York State Plants. Contributions to a Flora of New York State. Checklist IV. Bulletin No. 490.* New York State Museum. Albany, NY. 400 pp.

Native Plant Trust. 2024. *Corema conradii — broom-crowberry.* Go Botany 3.9. Framingham, Massachusetts. Available from: <https://gobotany.nativeplanttrust.org/species/corema/conradii/>. [Accessed 1/16/2024].

Newcomb, Lawrence. 1977. *Newcomb's Wildflower Guide: An Ingenious New Key System for Quick, Positive Field Identification of the Wildflowers, Flowering Shrubs, and Vines of Northeastern and North-Central North America.* Little, Brown and Company. Boston.

Nicholson, R., and J. Alexander. Undated. *Germination trials with Corema conradii.* Unpublished report of Massachusetts Heritage Program.

Redfield, J.H. 1884. *Corema conradii and its localities.* Bull. Torr. Bot. Club 11: 97-101.

Ring, Richard M. 2023. *New York Rare Plant Status Lists.* New York Natural Heritage Program, State University of New York College of Environmental Science and Forestry, Albany, NY. December 2023. 108 pp.

Smith, C.E. 1882. *New station for Corema conradii Torr.* Bulletin of the Torrey Botanical Club 9: 83.

Torrey, R.H. 1932. *The Corema conradii station on Shawangunk mountain.* Torreyia 32: 97-100.

Weakley, A.S. 2020. Flora of the southeastern United States. University of North Carolina Herbarium, North Carolina Botanical Garden, Chapel Hill, NC. Available from: <https://ncbg.unc.edu/research/unc-herbarium/floras/>

Zaremba, R. 1984. *Corema conradii*-Broom crowberry. Unpublished report of Massachusetts Heritage Program.