Hypericum gymnanthum

Clasping-leaf St. John's-wort

Clusiaceae

Hypericum gymnanthum courtesy R. W. Smith, Lady Bird Johnson Wildflower Center

***Hypericum gymnanthum* Rare Plant Profile**

New Jersey Department of Environmental Protection
State Parks, Forests & Historic Sites
State Forest Fire Service & Forestry
Office of Natural Lands Management
New Jersey Natural Heritage Program

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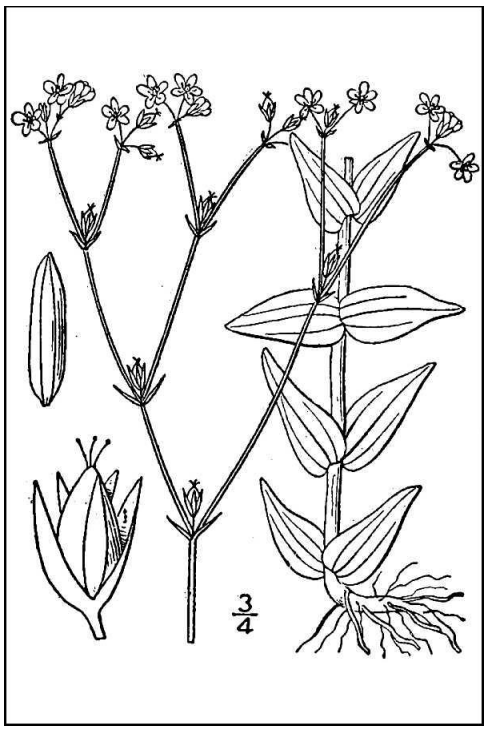
Life History

Hypericum gymnanthum (Clasping-leaf St. John's-wort) is an erect herb with opposite leaves. The genus *Hypericum* has traditionally been included in the Clusiaceae (mangosteen family) but it was recently transferred to the Hypericaceae (APG III 2009, Kartesz 2015). *Hypericum* is often subdivided and *H. gymnanthum* is typically placed in section *Brathys*. The section includes species that have capitate stigmas, spreading styles which separate to the bases, fewer than 20 stamens, and translucent glands in the leaves, sepals, or petals (Wood and Adams 1976).

Hypericum gymnanthum is an annual plant (Engelman and Gray 1847, Taylor 1915, Robson 2020) although it is frequently characterized as biennial or perennial (eg. Hill 1986, Drew et al. 1998, Allen and Thames 2007, Les 2017, Allain and Reed 2023), which suggests that established individuals may persist for a year or two when circumstances are favorable. *H. gymnanthum* develops a taproot and secondary fibrous roots (Hilty 2020) but does not reproduce vegetatively. No reports of extensive populations were found—the species is sometimes noted as infrequent, uncommon, or occasional within a given habitat (Drew et al. 1998, Dutton and Thomas 1991, Rosen et al. 2003, Sorrie et al. 2006, Kalk 2011) and a number of recorded occurrences throughout its range have consisted of a single plant (Mulhouse 2004, Hilty 2020, PADCNR 2022).




Left: Britton and Brown 1913, courtesy USDA NRCS 2023a. Center and Right: J. Richard Abbott, 2020.

Hypericum gymnanthum can be up to 9 dm in height but the plants are typically under 7 dm and sometimes considerably shorter. The stems are four-angled and simply branched or unbranched. The leaves are ovate-triangular, smooth-edged, and strongly clasping: They range from 5–25 mm in length and 3–12 mm in width and have 5–7 veins. The dichotomously branching floral stems

are leafless but have small bracts. The flowers have 3 styles, 10–14 stamens, 5 bright yellow petals that are 2–4 mm long, and 5 green sepals which are slightly longer than the petals. The fruits are narrow, cone-shaped capsules that equal or barely exceed the sepals in length. (See Engelmann and Gray 1847, Britton and Brown 2013, Fernald 1950, Gleason and Cronquist 1991, Robson 2020). *H. gymnanthum* can flower and fruit from May through September (Les 2017, Weakley et al. 2022). Stone (1911) noted that a population he observed in New Jersey had immature fruits present during the last week of July. At several other sites in the state *H. gymnanthum* has been found fruiting, or simultaneously flowering and fruiting, during the first week in August (NJNHP 2022).

Hypericum gymnanthum and *H. mutilum* are closely related and similar in appearance. The stems of *H. mutilum* are more likely to be branched, the flowers are smaller (3–5 mm diameter in contrast with 4.5–7 mm in *H. gymnanthum*), and the leaves are 2–5 times as long as wide whereas those of *H. gymnanthum* are 1.5–2 times as long as wide (Cooperrider 1989, Robson 2020). However, the two species have been known to hybridize (Robson 2020).

Pollinator Dynamics

Plants in the Clusiaceae are fertilized by a variety of insects ranging from beetles to butterflies, and fossilized flowers from early species which occurred in New Jersey suggest that bees have served as important pollinators for plants in that family since the Late Cretaceous period (Crepet and Nixon 1998). The nectarless blooms of *Hypericum* species are pollinated by an assortment of generalist insects that are likely to include syrphid flies, wasps, and bees (Nürk 2011, Les 2017). Bees have been observed collecting pollen from *Hypericum gymnanthum* flowers (Hilty 2020). Some bees documented on other *Hypericum* species include *Augochlorella striata*, *Bombus bimaculatus*, *B. borealis*, *B. terricola*, *Dialictus admirandus*, and *D. pilosus* (Stubbs et al. 1992). Broaddus and Annable (1991) noted the possibility of beetle pollination in *H. gymnanthum*, and the closely related *H. mutilum* is regularly visited by butterflies (Halbritter et al. 2015).

It is not clear whether or not *Hypericum gymnanthum* is self-compatible. Mártonfi and Mártonfiová (2011) observed that self-compatibility is widespread but not universal in the genus. Self-fertilization has been reported in the related *H. mutilum* and *H. canadense* (Meehan 1890).

Seed Dispersal

Most species of *Hypericum* produce numerous seeds (Gleason and Cronquist 1991, Nürk 2011). The seeds of *H. gymnanthum* are very small (0.5–0.6 mm) and marked with faint longitudinal ribs (Engelmann and Gray 1847, Robson 2020). The majority of *Hypericum* seeds are dispersed by wind or water (Les 2017). Long-distance dispersal is likely to be facilitated by animals, particularly ducks (Fassett 1957). Howard and Allain (2012) indicated that the seeds of *H. gymnanthum* were of moderate value as a waterfowl food source. The small, rough-surfaced seeds can also readily attach to potential dispersers (Nürk 2011) and that is thought to be the means by which Clasping-leaf St. John's-wort was transported to the Azores (Robson 2020).

Consumption by muskrats and deer has also been reported for some *Hypericum* species (Fassett 1957) and that could also result in the distribution of seeds (Janzen 1984).

Hypericum gymnanthum can form a seed bank, although the length of time the propagules are able to persist in the soil has not been determined (Les 2017). At least in the short term, the strategy permits the St. John's-wort to remain dormant during unfavorable periods and emerge when conditions improve. The survival of even a small number of viable seeds might allow a population to reestablish. Near the end of a four-year drought in South Carolina, Mulhouse (2004) recorded *H. gymnanthum* growing in a dry Carolina Bay even though the species had not been detected in a seed bank study of the site two years earlier. During a Louisiana study of plant community responses to changing water levels in a freshwater impoundment, Howard and Allain (2012) found that *H. gymnanthum* was absent when sites were inundated but appeared during periods of drawdown. While monitoring for two consecutive years of drawdown the authors found *H. gymnanthum* in 1 of 35 plots the first year and 10 of 35 plots in the second year.

During a restoration project at a cluster of sites that had formerly been developed as homesteads and then abandoned after storm surge inundation by hurricanes in 1998 and 2005, Kalk (2011) first removed all existing vegetation then applied sods from different local community types and tracked the flora that subsequently established on the plots. *H. gymnanthum* was not observed frequently but turned up in one control site, one site treated with brackish marsh sod, and one site treated with freshwater marsh sod. It was unclear whether the treatments influenced the presence of *H. gymnanthum* or if the species had simply emerged from an existing seed bank at the site.

Establishment requirements have not been well-studied for *Hypericum gymnanthum* although seed germination reportedly improves following a period of cold, moist stratification (Allain and Reed 2023). Research on other *Hypericum* species indicated that the amount of light needed for germination varies considerably within the genus (Deno 1993). It is equally uncertain whether *H. gymnanthum* forms fungal associations, as reports of mycorrhizae in *Hypericum* are inconsistent (Wang and Qiu 2006).

Habitat

Hypericum gymnanthum is usually found in open sites that are moist, wet, or periodically wet. The species has been reported at elevations up to 506 meters above sea level (Les 2017). Bottomlands and lowlands are typical for *H. gymnanthum*, but it can also grow in depressions and swales at higher elevations (Silberhorn 1970, Drew et al. 1998, Neill and Wilson 2001, Rosen et al. 2003). Cited habitats for Clasping-leaf St. John's-wort include savannas, prairies, flatwoods, and other wet places such as seeps, springs, bogs, marshes, swamps, sinkholes or shorelines (Smith and Lipscomb 1975, Hough 1983, Robertson et al. 1983, Hill 1986, Dutton and Thomas 1991, Morris 1997, Fleming and Van Alstine 1999, MacRoberts et al. 2002, Morris and MacDonald 2012, Les 2017, Robson 2020, Allen 2021, Weakley et al. 2022, Allain and Reed 2023).

Hypericum gymnanthum is often associated with locations that are alternately wet and dry such as intermittent ponds or shorelines with fluctuating water levels (Wahl 1945, Zaremba and

Lamont 1993, Mulhouse 2004, Rhoads and Block 2007, Johnson and Walz 2013, Hilty 2020, PADCNR 2022). A number of New Jersey occurrences have been situated in seasonal ponds that originated as abandoned sand pits (NJNHP 2022). Zampella and Laidig (2003) found that well-established (50+ yrs old) excavated ponds could become functionally equivalent to natural seasonal pools.

Hypericum gymnanthum generally prefers to grow in full sun (Les 2017). When the species occurs in forested habitats it is likely to be situated in a natural or artificial clearing or a community with a relatively sparse tree cover (North 1983, Alford 2001, Robson 2020). Substrates may include silt, loam, clay, sand, gravel, peat, and various combinations thereof, and they range from acidic to calcareous (Les 2017, Pryer et al. 2019, Allen 2021, NJNHP 2022).

More detailed descriptions are available for some of the communities where *Hypericum gymnanthum* has been found. In North Carolina, Sorrie et al. (2006) recorded the species in Sandhill/Streamhead Pocosin Ecotones and Coastal Plain Semipermanent Impoundments. The ecotones were acidic fens maintained by seepage and dominated by a mixture of graminoids and other herbaceous species with scattered shrubs and few trees. Semipermanent impoundments occurred where beavers or humans had altered the environment by damming streams, creating herb-dominated habitats along the margins and upper reaches of the resulting ponds. Examples of some Oklahoma communities included a *Hamamelis vernalis/virginiana - Cornus obliqua* Shrubland Association (Hoagland and Buthod 2009) and a *Fraxinus pennsylvanica* Forest Association (Buthod and Hoagland 2020).

There are also numerous records of *Hypericum gymnanthum* growing in disturbed areas including borrow pits, clearcuts, ditches, fields, pastures, quarries, roadsides, and utility rights-of-way (Penfound and Watkins 1937, Dutton and Thomas 1991, Simmons et al. 1995, Weldy 1995, Allen et al. 2001, Wilder and McCombs 2002, Marsico 2005, Shelingoski et al. 2005, Allen and Thames 2007, Morris 2013, Hoagland et al. 2015, Les 2017, Robson 2020). Anthropogenic habitats where *H. gymnanthum* is found are likely to have open canopies and sufficient available moisture, and some are subject to periodic disturbances (eg. grazing, mowing) that keep woody succession in check. McFarland et al. (2020) reported the documentation of *H. gymnanthum* at a site that had been managed by prescribed fires for a decade, with burns conducted about every other year.

Wetland Indicator Status

The U. S. Army Corps of Engineers divided the country into a number of regions for use with the National Wetlands Plant List and portions of New Jersey fall into three different regions (Figure 1). *Hypericum gymnanthum* has more than one wetland indicator status within the state. In the Atlantic and Gulf Coastal Plain region it is a facultative wetland species, meaning that it usually occurs in wetlands but may occur in nonwetlands. In other parts of the state it is an obligate wetland species, meaning that it almost always occurs in wetlands (U. S. Army Corps of Engineers 2020).

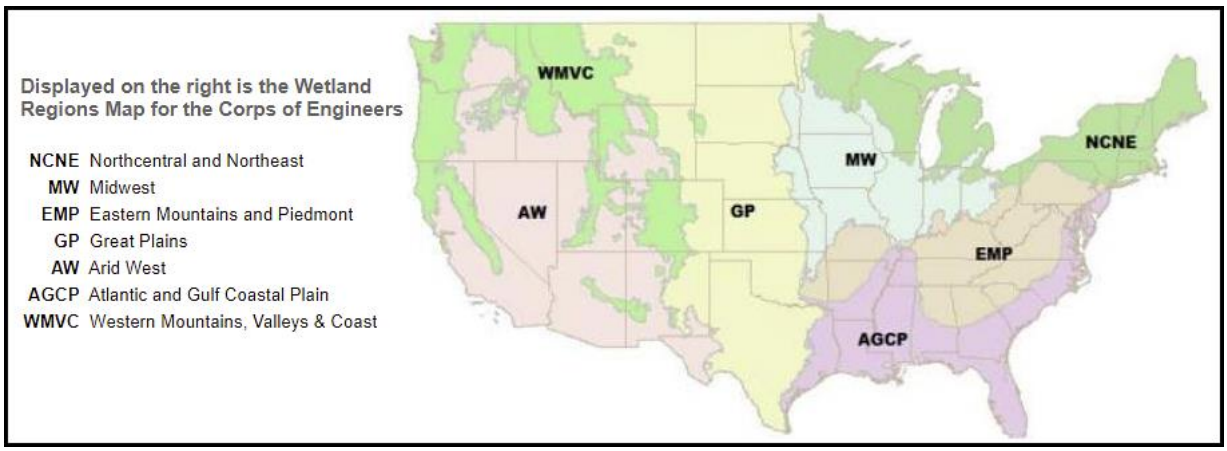


Figure 1. Mainland U. S. wetland regions, adapted from U. S. Army Corps of Engineers (2020).

USDA Plants Code (USDA, NRCS 2023b)

HYGY

Coefficient of Conservancy (Walz et al. 2020)

CoC = 7. Criteria for a value of 6 to 8: Native with a narrow range of ecological tolerances and typically associated with a stable community (Faber-Langendoen 2018).

Distribution and Range

Hypericum gymnanthum is native to the United States and Central America (POWO 2023). The species was once established in Poland but subsequently became extirpated (Robson 2020). Since 1950 it has naturalized on Faial Island in the Azores (Schäfer 2002). Despite a relatively wide distribution, *H. gymnanthum* does not appear to be common anywhere in its range (Broaddus and Annable 1991). The map in Figure 2 depicts the extent of Clasping-leaf St. John's-wort in North America. Populations at the northwestern end of the species' range were noted to be part of an assemblage of flora that were more typical of the coastal plain but also occurred on the southernmost islands and borders of the Great Lakes (Schaffner 1915, Peattie 1922).

The USDA PLANTS Database (2023b) shows records of *Hypericum gymnanthum* in six New Jersey counties: Atlantic, Burlington, Cape May, Cumberland, Gloucester, and Salem (Figure 3). The data include historic observations and do not reflect the current distribution of the species. Two specimens in the Chrysler Herbarium labeled as *H. gymnanthum* originated in Morris and Sussex counties (Mid-Atlantic Herbaria 2023). Hough (1983) noted that the Morris specimen was a possible hybrid and did not include Sussex County in her state distribution map for the St. John's-wort. Snyder (2000) indicated that historical records from counties other than Atlantic, Burlington, Cumberland, and Salem were based on material that had been misidentified.

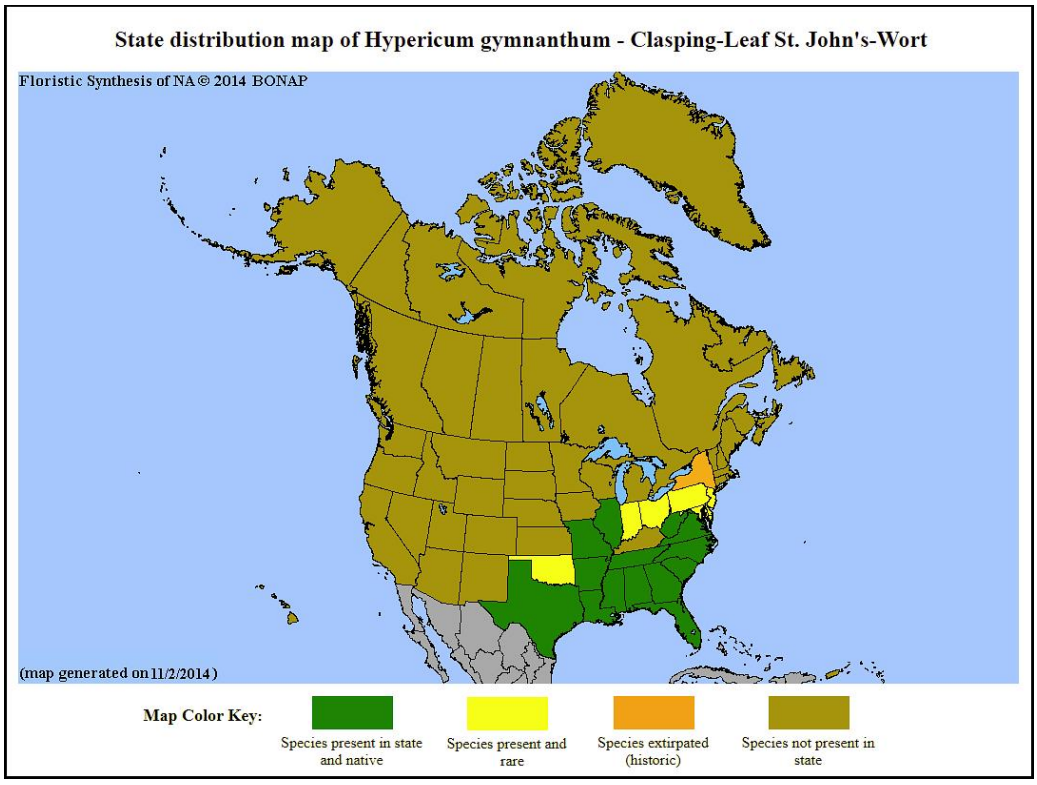


Figure 2. Distribution of H. gymnanthum in North America, adapted from BONAP (Kartesz 2015).

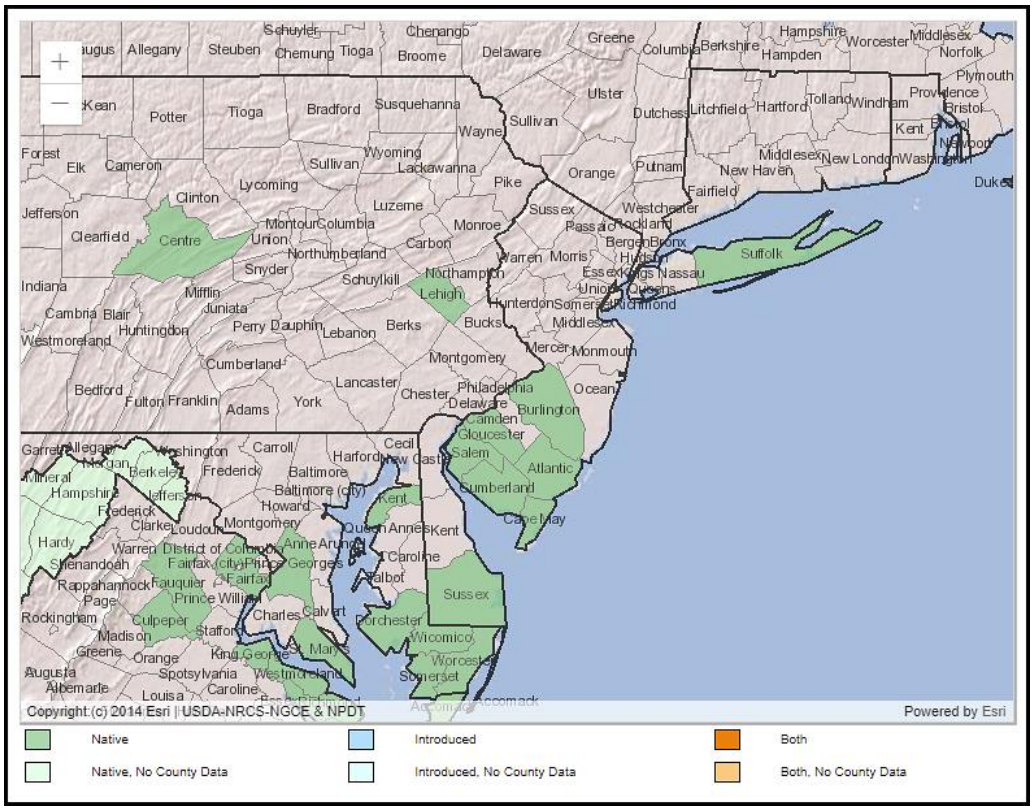


Figure 3. County records of H. gymnanthum in New Jersey and vicinity (USDA NRCS 2023b).

Conservation Status

Hypericum gymnanthum is apparently secure at a global scale. The G4 rank means the species is at fairly low risk of extinction or collapse due to an extensive range and/or many populations or occurrences, although there is some cause for concern as a result of recent local declines, threats, or other factors (NatureServe 2023). The map below (Figure 4) illustrates the conservation status of Clasping-leaf St. John's-wort throughout its range. *H. gymnanthum* is vulnerable (moderate risk of extinction) in three states, imperiled (high risk of extinction) in one state, and critically imperiled (very high risk of extinction) in four states. At one time the species was thought to be extirpated in Pennsylvania (Rhoads and Block 2007) but it was recently reclassified as Endangered based on the discovery of a single plant (PADCNR 2022).

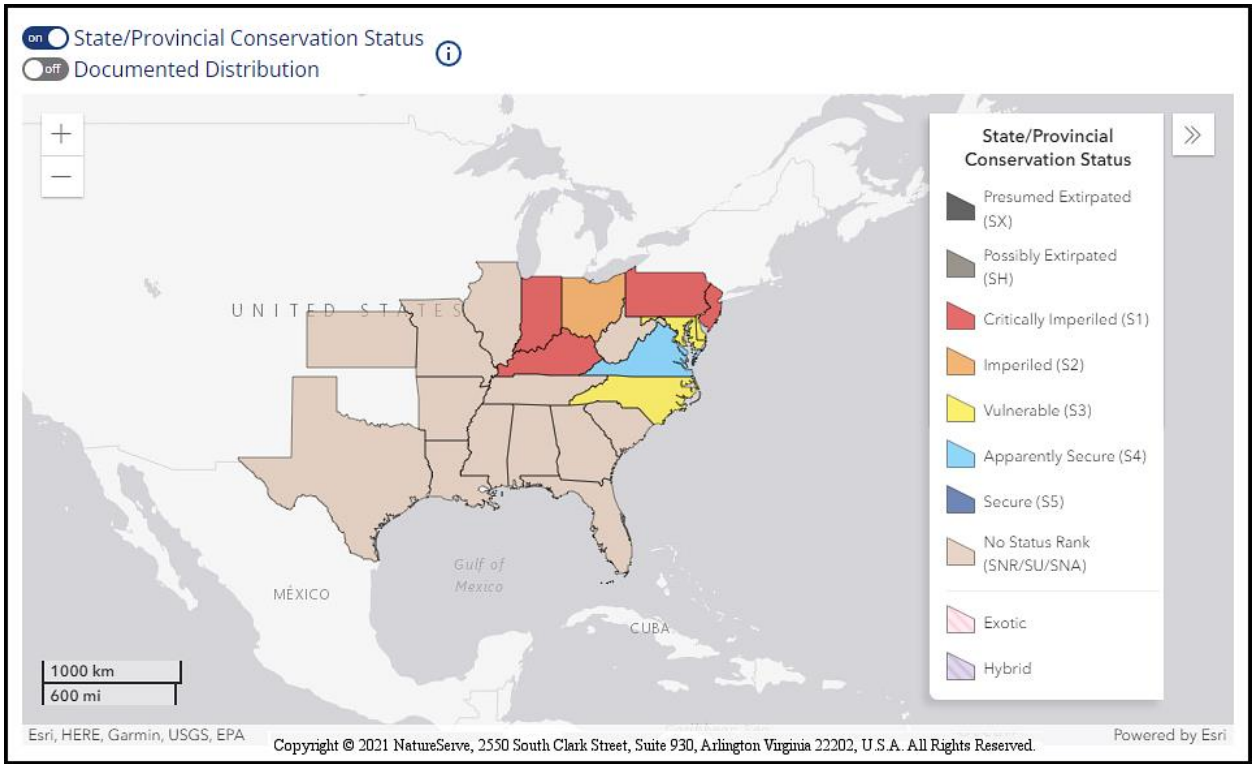


Figure 4. Conservation status of H. gymnanthum in North America (NatureServe 2023).

New Jersey is one of the states where *Hypericum gymnanthum* is critically imperiled (NJNHP 2022). The S1 rank signifies five or fewer occurrences in the state. A species with an S1 rank is typically either restricted to specialized habitats, geographically limited to a small area of the state, or significantly reduced in number from its previous status. *H. gymnanthum* is also listed as an endangered species (E) in New Jersey, meaning that without intervention it has a high likelihood of extinction in the state. Although the presence of endangered flora may restrict development in certain communities such as wetlands or coastal habitats, being listed does not currently provide broad statewide protection for the plants. Additional regional status codes assigned to *H. gymnanthum* signify that the species is eligible for protection under the jurisdictions of the Highlands Preservation Area (HL) and the New Jersey Pinelands (LP) (NJNHP 2010).

The initial report of *Hypericum gymnanthum* in New Jersey was based on a specimen obtained in Gloucester County (Britton 1889) and the species was subsequently collected in Burlington County (Stone 1911). *H. gymnanthum* was found at four locations in Cumberland County around the 1930s and at a single site in Atlantic County in 1961 (NJNHP 2022). After that the species was not seen in the state again for nearly four decades until one of the 1930s-era occurrences was relocated by Snyder (2000). Unfortunately that population was extirpated when the habitat was destroyed (NJNHP 2022), but Moore et al. (2016) subsequently reported the discovery of a new occurrence in Cumberland County. *Hypericum gymnanthum* was recently documented in Cape May County where two small populations were found by Snyder during 2020 (NJNHP 2022).

Threats

Many of the natural habitats that are most suitable for *Hypericum gymnanthum* have been lost or degraded and others face ongoing pressure. For example, intermittent ponds on the coastal plain have less legal protection than many other wetland types (Kirkman et al. 1999) and historically they were subject to drainage and development, resource extraction, and agricultural uses. Current threats continue in the form of groundwater drawdown resulting from offsite activities, pollution, and off-road vehicles (Broaddus and Annable 1991, Zaremba and Lamont 1993, Johnson and Walz 2013, PADCNR 2022). Prairies have faced a similar decline in North America, with losses estimated at 82–99% of the former cover (Samson and Knopf 1994). Prairie habitats where *H. gymnanthum* has been documented in recent decades were often small remnants associated with railroads and cemeteries or sites that had been utilized for rice cultivation and livestock grazing (Robertson et al. 1983, Dutton and Thomas 1991, Allen and Thames 2007).

As an annual herb, *Hypericum gymnanthum* is capable of maturing and reproducing in a single season. The strategy can permit the species to take advantage of ruderal habitats (Grime 1977) and the many reports of *H. gymnanthum* growing in disturbed sites suggest that it has been able to do so, at least to some extent. However, chances of success are limited by the random odds of long distance dispersal to a favorable location, and once established the species may be reliant on periodic disturbances to maintain a site's suitability. Plant community shifts resulting from natural succession are a recognized threat to extant populations of *H. gymnanthum* (Les 2017, PADCNR 2022) and successional changes apparently led to the demise of at least one New Jersey occurrence (NJNHP 2022).

Hilty (2020) identified a number of insects that feed on *Hypericum* plants including a leaf beetle (*Pachybrachis relictus*), larvae of a butterfly (*Strymon melinus*), and larvae of a moth (*Nedra ramulosa*). Both the beetle and the butterfly are generalists, utilizing plants from more than one family (Clark et al. 2004, BugGuide 2023), and are therefore unlikely to have any significant impact on *H. gymnanthum*. However *Nedra ramulosa* (Gray Half-spot) is a specialist that has only been recorded on species of *Hypericum* and *Triadenum*, including closely related taxons such as *H. mutilum* and *H. canadense* (BugGuide 2023, Hall et al. 2023, Mello et al. 2023). The Gray Half-spot can be found throughout the eastern United States (NAMPG 2023) and is relatively common in New Jersey (Dodds, unpublished data). Although native insects are

generally not a threat to their food plants the moth larvae could have a detrimental effect on small populations of *Hypericum gymnanthum*, particularly those that consist of just a few individual plants. Herbivory by deer has also been identified as a threat to *H. gymnanthum* in Pennsylvania (PADCNR 2022). While deer browse has not yet been noted as a concern for *H. gymnanthum* in New Jersey (NJNHP 2022), that is another scenario wherein a single incident could have an outsized impact on a small population.

Nedra ramulosa (Gray Half-spot), J. S. Dodds, 2020

In New Jersey, existing threats to *Hypericum gymnanthum* are likely to be compounded by changing climactic conditions. In addition to rising temperatures, shifting precipitation patterns in the region are resulting in more extreme episodes of both heavy rainfall and drought (Hill et al. 2020). An evaluation by Ring et al. (2013) concluded that *H. gymnanthum* is moderately vulnerable to climate change, meaning that its abundance and/or range extent in the state is likely to decrease by 2050. The intermittent ponds where the species resides are particularly susceptible to altered hydrologic conditions (Johnson and Walz 2013). The future of *H. gymnanthum* in the state is likely to depend on both persistence in the seed bank and the ability to colonize new sites, both of which are difficult to forecast based on available information.

Management Summary and Recommendations

The known extent of *Hypericum gymnanthum* in New Jersey is presently limited to two small occurrences but the sites were only discovered recently and have not been fully surveyed. Thorough searches are needed to document the full extent of the populations and identify potential threats. Monitoring visits should include a check for herbivory damage.

Searches of historical and potential habitat might turn up additional populations of *Hypericum gymnanthum*. There are a number of former occurrences where suitable habitat is still thought to be present (NJNHP 2022), and since the species is known to colonize disturbed sites it could be worthwhile to check open, moist or intermittently wet habitat in the vicinity of extant or historic locations. At one site where brushy growth appears to have eliminated *H. gymnanthum* it is possible that clearing of the vegetation could allow the St. John's-wort to regenerate from dormant seeds.

It would be useful to know how long *H. gymnanthum* can persist in the seed bank, and there are a number of other areas where additional research could provide foundational information for long-term conservation of the species. *Hypericum gymnanthum* is generally rare in the northern part of its range and there may be unidentified climactic factors that limit its current distribution. Specific information is also lacking regarding self-compatibility, establishment requirements, mycorrhizal associations, and competitive interactions.

Synonyms

The accepted botanical name of the species is *Hypericum gymnanthum* Engelm. & A. Gray. Orthographic variants, synonyms, and common names are listed below (ITIS 2021, POWO 2023, USDA NRCS 2023b).

Botanical Synonyms	**Common Names**
Hypericum canadense var. *cardiophyllum* R. Keller	Clasping-leaf St. John's-wort
Hypericum mutilum var. *gymnanthum* (Engelm. & A. Gray) A. Gray	
Sarothra gymnantha (Engelm. & A. Gray) Y.	

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