

CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: Helianthus verticillatus Small

COMMON NAME: whorled sunflower

LEAD REGION: 4

INFORMATION CURRENT AS OF: February 2003

STATUS/ACTION (Check all that apply):

New candidate

Continuing candidate

Non-petitioned

Petitioned - Date petition received: ____

90-day positive - FR date: ____

12-month warranted but precluded - FR date: ____

Is the petition requesting a reclassification of a listed species?

Listing priority change

 Former LP: 5

 New LP: 11

Latest date species first became a Candidate: June 13, 2002

Candidate removal: Former LP: ____ (Check only one reason)

A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

F - Range is no longer a U.S. territory.

M - Taxon mistakenly included in past notice of review.

N - Taxon may not meet the Act's definition of *Species*.@

X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Plants - Asteraceae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Alabama, Georgia, Tennessee

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Alabama, Georgia, Tennessee

LEAD REGION CONTACT (Name, phone number): Rick Gooch, 404/679-7124

LEAD FIELD OFFICE CONTACT (Office, name, phone number): Jackson, Mississippi Field Office, Cary Norquist, 601/321-1128

SUPPORTING FIELD OFFICE(S): Daphne, Alabama Field Office; Athens, Georgia Field Office; Cookeville, Tennessee Field Office

BIOLOGICAL INFORMATION (Describe habitat, historic vs. current range, historic vs. current population estimates (# populations, #individuals/population), etc.):

Species Description

Helianthus verticillatus, a member of the sunflower family, is a perennial arising from horizontal tuberous-thickened roots with slender rhizomes. The stems are slender, erect, and up to 2 meters (m) (6 feet) tall. The leaves are opposite on the lower stem; verticillate (whorled) in groups of 3 to 4 at the mid-stem; and alternate or opposite in the inflorescence at the end. Individual leaves are firm in texture and have a prominent mid-vein. The leaves are linear-lanceolate in shape, narrowing at the tip to a point, and 7.5 to 18.5 centimeters (cm) (3.0 to 7.2 inches (in.)) long and 0.7 to 2.0 cm (0.3 to 0.8 in.) wide. The flowers are arranged in a branched inflorescence with 3 to 5 heads. The heads are about 1 cm high (0.4 in.), 1.5 cm (0.6 in.) wide and have deep yellow ray flowers and lighter yellow disk flowers. The seeds are achenes are 4 to 5 millimeters (0.2 in.) long. Flowering occurs in late August into October (Matthew et al. 2002).

Several members of the aster family are similar in appearance to H. verticillatus, with minor morphological differences being apparent. Helianthus grosseserratus is similar to H. verticillatus but its leaves are arranged in an alternating pattern as which differs from the whorled arrangement of H. verticillatus. Helianthus angustifolius can be confused with H. verticillatus but it has narrower leaves and reddish disk flowers, as opposed to the yellow disk flowers of H. verticillatus (Schotz 2001).

Taxonomy

Helianthus verticillatus was described in 1898 by J.K. Small based on a collection by S.M. Bain from Chester County, Tennessee in 1892 (Nordman 1998). Small (1898) distinguished it from the related H. giganteus by its mostly whorled leaves, glabrous stems, narrow, entire leaf blades, and its narrowly linear-lanceolate involucre bracts. No additional collections of this species had been made when Beatley (1963) speculated that the specimens from this single collection site (which lacked basal parts and mature achenes) perhaps represented a single aberrant individual formed from hybridization of a opposite- and alternate-leaved Helianthus species. With no new material to examine, Heiser (1969) and Cronquist (1980) accepted Beatley=s suggestion that H. verticillatus was a hybrid.

The rediscovery of the species in 1994 provided ample material for reexamination of this species= taxonomic status. Plants throughout these new populations conform to the morphology of the type collection of H. verticillatus. Recent morphological studies and genetic analyses have validated this species= taxonomic validity (Matthew). Root-tip chromosome counts of the type specimen and recent collections have shown H. verticillatus to be a fertile, diploid species (Matthew et al. 2002).

Habitat

This species is found in moist, prairie-like openings in woodlands and along adjacent creeks. Soils are sandy clays which are alkaline, high in organic matter, and seasonally wet. The soil type in the wet prairie habitat in northwest Georgia is likely of the Ketona series (Matthew et al. 2002) and in Alabama, populations inhabit the Gaylesville silty clay loam soils (Schotz 2001).

These series consist of deep, poorly, drained, slowly permeable soils formed from limestone. They are on floodplains and depressed areas in limestone valleys. They are saturated with water in late winter and early spring and subject to flooding. In Tennessee, the population is on Falaya silt loam, from alluvial deposits of Tertiary Porters Creek Clay (Matthew et al. 2002).

These communities have strong affinities to the Tall Grass Prairie (e.g. Schizachyrium scoparium, (little bluestem), Sorghastrum nutans (Indian grass)) and are habitat for a number of rare species including Marshallia mohrii (Mohr=s Barbara=s buttons), which is federally listed as threatened. Other common associates in Alabama include Carex cherokeensis, Andropogon gerardii, Physostegia virginiana, Silphium terebinthinaceum, H. angustifolius, and Helenium autumnale (Schotz 2001).

Historical Range

After the first collection of H. verticillatus in 1892 from Chester County, Tennessee, this species was not seen again for over 100 years until in 1994 Allison (1997, 2002) identified a specimen collected by Ware in 1993 from a prairie area in Floyd County, Georgia as H. verticillatus. Surveys by Allison continued, and in 1996, along with A. Schotz of the Alabama Natural Heritage Program, a second population was discovered in a remnant strip of prairie in Cherokee County, Alabama. This new population was about 3.2 kilometers (km)(2 miles (mi.)) west of the Georgia locality. In 1998, Nordman (1998) rediscovered the species in Tennessee with his collection near Pinson in Madison County. Pinson is about 10 km (6.3 mi.)northwest of Henderson, the locality given for Bain=s 1892 collection. Nordman surveyed Chester and Madison Counties, Tennessee, along with four contiguous counties and found no other populations (Nordman 1999). In 1999, Schotz (2001) found a second occurrence in Alabama, about 2 km (1.2 mi.) southwest of the other Alabama population. Continued surveying in Floyd County, Georgia have revealed several additional local populations in the general area of the original Floyd County population (Allison 2002).

Current Range

Currently, there are a total of six populations known for this species. There are two populations documented for Alabama (both in Cherokee County); three in Floyd County, Georgia (separated from one another by a distance of 3/4 to 1 mile); and a single site in Madison County, Tennessee.

Population Status/Estimates

Status surveys have been conducted for this species throughout its range (Allison 2002, Nordman 1998, Schotz 2002). Despite these extensive surveys, population numbers have remained low. Schotz (2002) located 1 new population out of 44 attempts, representing a success rate of only 2 percent. It is difficult to determine the exact number of plants due to the species= rhizomatous nature; however, estimates of population sizes have been made. The

largest population known occurs in Georgia where thousands of plants are estimated to occur within the vicinity of the original site in the prairie. At the second Georgia site only four plants have been counted and 35 were observed at the third Georgia site (Allison 2002). The Alabama sites are both rated AC@ which implies that each occurrence is small and partially degraded, but can be potentially enhanced with restoration efforts. Stem counts at one site were 64 and 37 at the second Alabama site. The plants occupy areas less than few hundred meters squared and both are considered feeble populations (Schotz 2002). At the single site in Tennessee, an estimated 700 to 1,200 stems were found growing along a railroad right-of-way, in an adjacent hayfield, along a roadside right-of-way, and along a nearby creek (Nordman, pers. comm. 1999). Surveys during 2000 and 2002 (Lincicome, Tennessee Department of Environment and Conservation, pers. comm. 2003) were unsuccessful at locating any additional sites.

The majority of the Georgia plants are within an conservation easement recently donated (February 2003) to The Nature Conservancy by Temple-Inland. The donation of this easement ensures permanent protection for those plants within the easement by restricting timbering activities and future development on the property. Active management of the site and monitoring studies are planned as part of the easement agreement.

THREATS (Describe threats in terms of the five factors in section 4 of the ESA providing specific, substantive information. If this is a removal of a species from candidate status or a change in listing priority, explain reasons for change):

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

This species appears to be a narrow habitat specialist occurring in natural wet meadows or prairies and calcareous barrens. Such habitats are not very extensive, and they are often degraded or destroyed for a number of reasons (i.e., agriculture, timber harvest, residential development). Most of the remaining wet prairies exist as remnants along roadside rights-of-way where mid-successional stages are artificially maintained (Allison *in litt.* 1999, Matthew *et al.* 2002).

The greatest threat to this species appears to be from industrial forestry practices (Allison *in litt.* 1999). While surveying potential habitat for additional populations, Allison (*in litt.* 1999) noted that much of this species= prairie habitat had been converted to pine monoculture. Both of the Alabama population have been impacted by timbering (Schotz 2002).

Helianthus verticillatus has not been relocated at the type locality in Tennessee despite intensive surveys of that area (Nordman 1998). However, this record is over 100 years old and locality information is vague, so it is not possible to ascertain the reason for the loss of that site. In Tennessee, much of this species= suitable habitat has been converted for agricultural usage (Nordman, pers. comm. 1999). The extant Tennessee population is surrounded by cultivated fields and pastures. The largest concentration of plants at the Tennessee population is located in a natural hayfield (Nordman 1998). Improvement of the hayfield with fertilization and the introduction of non-native grasses would be detrimental to the population. Plants extending onto the roadside and railroad rights-of-way at this location, and at one of the Alabama sites, are vulnerable to accidental disturbances. These plants could be destroyed if herbicides are used in

association with road and railroad right-of-way maintenance. Any future road construction poses a potential threat to plants located near the road.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

Helianthus verticillatus is currently not known to be a component of commercial wildflower trade; however, it is attractive and has horticultural potential. Taking and vandalism pose threats because of the species= visibility when flowering and the accessibility of the sites.

C. Disease or predation.

This species is not known to be threatened by disease or predation.

D. The inadequacy of existing regulatory mechanisms.

Helianthus verticillatus is a species of special concern in Tennessee and considered endangered in Alabama and Georgia (Allison, pers. comm. 1999; Nordman, pers. comm. 1999; Schotz, Alabama Heritage Program, pers. comm. 1999). The majority of the Georgia population is protected through a Conservation Easement with The Nature Conservancy. The Alabama and Tennessee sites receive no protection.

E. Other natural or manmade factors affecting its continued existence.

The whorled sunflower is extremely vulnerable because of the small number of known populations. Helianthus verticillatus appears to have restricted ecological requirements and is dependent upon the maintenance of prairie-like openings for its survival. Soil conditions, in combination with occasional, naturally occurring fires, are thought to have played a role in maintaining suitable habitat. Much of this species= habitat has been degraded due to fire suppression and the subsequent invasion of woody competitors (Allison, pers. comm. 1999). Extant sites will require active management to keep competition and shading under control.

BRIEF SUMMARY OF REASONS FOR REMOVAL OR LISTING PRIORITY CHANGE:

Even though there are only 6 sites known for this species, the largest population is permanently protected through a conservation easement with The Nature Conservancy. The magnitude of threat is now considered moderate due to this recent development. The threats are viewed as not imminent, in that the species is able to withstand some disturbance and we know of no projects/activities at this time that imminently threatened the other populations.

FOR RECYCLED PETITIONS:

- a. Is listing still warranted? ___
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? ___
- c. Is a proposal to list the species as threatened or endangered in preparation? ___
- d. If the answer to c. above is no, provide an explanation of why the action is still precluded.

LAND OWNERSHIP (Estimate proportion Federal/state/local government/private, identify non-private owners):

All known populations occur on private land. Temple-Inland Container Corporation, an industrial forestry company, owns the sites in Alabama and Georgia. Temple-Inland recently donated a conservation easement in the Coosa Valley Prairie to The Nature Conservancy, thereby protecting the majority of the Georgia plants.

PRELISTING (Describe status of conservation agreements or other conservation activities):

The Georgia Department of Natural Resources and The Nature Conservancy have been working with staff of Temple-Inland to develop a conservation strategy for the population in Floyd County, Georgia. Temple-Inland implemented a prescribed burn and timber thinning in 2000 to improve habitat conditions for this species. This company recently donated (February of 2003) a conservation easement of this property to The Nature Conservancy, thereby protecting the Georgia populations of this species. Dialog to obtain protection of the Alabama sites has been initiated. The Service has funded status surveys throughout the species= range. These surveys have been completed.

REFERENCES (Identify primary sources of information (e.g., status reports, petitions, journal publications, unpublished data from species experts) using formal citation format):

Allison, J.R. 1997. Rediscovery of the whorled sunflower, Helianthus verticillatus Small (abstract). ASB Bulletin 44(2):143-144.

Allison, J.R. 2002. Survey for Helianthus verticillatus Small in Georgia. Unpublished report of the U.S. Fish and Wildlife Service, Jackson, MS. 2 pp. + appendices.

Beatley, J.C. 1963. The sunflowers (genus Helianthus) in Tennessee. J. Tenn. Acad. Sci. 38:135-154.

Cronquist, Arthur. 1980. Vascular Flora of the Southeastern United States. Vol. 1, Asteraceae. University of North Carolina Press. Chapel Hill, NC. 261 pp.

Heiser, C.B., Jr. 1969. The North American sunflowers (Helianthus). Mem. Torrey Bot. Club 22(3).

Matthew, J.F, J.R. Allison, R.T. Ware, Sr. and C. Nordman. 2002. Helianthus verticillatus Small (Asteraceae) rediscovered and redescribed. Castanea 67:13-24.

Nordman, Carl. 1998. Survey report on Helianthus verticillatus in Tennessee. Unpublished report to U.S. Fish and Wildlife Service, Jackson, MS. 4 pp. + appendices.

Ranger, S. 1995. The strange sunflower from the Floyd prairies. Ga. Bot. Soc. Newsletter 68 (1):1.

Schotz, A.R. 2001. Status survey report on Helianthus verticillatus in Alabama. Unpublished report to U.S. Fish and Wildlife Service, Jackson, MS. 6 pp. + appendices.

Small, J.K. 1898. Studies in the botany of the southeastern United States **BXIV**. 1. Hitherto undcribed species. Bull. Torr. Bot. Club 25:465-482.

LISTING PRIORITY (place * after number)

THREAT

Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11*
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: Though there are only 6 populations, the largest site is now permanently protected through a conservation easement with The Nature Conservancy, thus the magnitude is now considered moderate.

Imminence: The species appears to withstand some disturbance and there are no known immediate threats.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, removal of candidates, and listing priority changes.

Approve: Linda Kelsey March 14, 2003
Acting Regional Director, Fish and Wildlife Service Date

Concur: Steve Williams April 5, 2004
Director, Fish and Wildlife Service Date

Do not concur: _____
Director, Fish and Wildlife Service Date _____

Director's Remarks:

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Date of annual review: February 2003

Conducted by: Cary Norquist - Jackson, Mississippi FO

Comments:

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