

CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Leavenworthia texana*

COMMON NAME: Texas golden gladeceess

LEAD REGION: Region 2

INFORMATION CURRENT AS OF: Feb. 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: \_\_\_\_

    New LP: \_\_\_\_

Latest Date Species first became a Candidate: 8/17/97

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 Aspecies.@

X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Plant, Brassicaciae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Texas

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE:

San Augustine County, Nacogdoches County / Texas / USA

LEAD REGION CONTACT: Susan Jacobsen, 505-248-6641

LEAD FIELD OFFICE CONTACT: Clear Lake Field Office, Texas, Carlos Mendoza,  
281-286-8282

## BIOLOGICAL INFORMATION:

Dr. M.C. Leavenworth (a U.S. Army medical officer) first collected species at San Augustine in 1836-37. E. J. Palmer collected the species in 1915 and 1918, followed by D.S. and H.B. Correll in 1961-1962. E.S. Nixon (Stephen F. Austin State University, Nacogdoches, TX) studied and mapped populations in 1979-1980.

The Texas golden gladecress is a small annual member of the mustard family. The petals are narrowly obovate, and the terminal leaf segment is slightly wider than long and angularly toothed. The bright, deep-yellow flowers bloom early in the year (January-February) and for a short period, restricting the time available for surveys at known sites and searches for new sites. The gladecress, along with the endangered white bladderpod (*Lesquerella pallida*), occur only on the Weches outcrops of east Texas. At present, the bladderpod and gladecress are known to exist only in San Augustine County.

The Weches geologic formation consists of a layer of calcareous sediment, lying above a layer of glauconite clay up to 20 inches below the surface. The formation was produced by ancient Eocene seas 30 to 50 million years ago and is one of the most richly fossiliferous of the Coastal Plain, containing the remains of nearly 100 species of corals and crustaceans. It averages five miles in width as it parallels Highway 21 through north San Augustine County. Erosion of the complex has produced a rugged topography of steep, flat-topped hills and escarpments, dissected by deep valleys. It has also created the unique ecology of bladderpod habitats: islands of thin, loamy, alkaline soils (pH 7-8), within the normally deep, sandy, acidic soils (pH 4-5) of the Pineywoods region. The glauconite layer of the Weches is impermeable to water, making the thin upper soils seepy and wet much of the year, but often hard and dry during the summer. This, and the alkalinity of the soils, produce conditions unique to Weches outcrops, generally supporting open-sun, herbaceous, and specialized plant communities. Weches glades have some similarity to limestone glades in parts of Oklahoma and Alabama; caliche glades on the Texas Edwards Plateau; and the Catahoula barren communities of north Jasper and Newton counties of Texas. The environmental factors shared by these communities are shallow, calcareous soils; primarily open-sun conditions; herbaceous-dominated vegetation; and fluctuation from spring soil saturation to summer drought.

The open, seepy Weches glades support highly diverse plant communities. More than 100 species, representing at least 39 plant families, have been documented on Weches glades. Most are small, herbaceous, and either annuals or biennials. Besides the endemic bladderpod and gladecress, some species are found nowhere else in eastern Texas, or are uncommon in the Pineywoods. Populations of blazing star, whitlow-wort, and yellow evening-primrose lie more than 200 miles disjunct from their range on the Edwards Plateau, and purple prairie-clover lies more than 135 miles from its central Texas range. Other species, such as blue waxweed and spike-rush, reach the western extreme of their range here and are found nowhere else in Texas. More wide-spread species include Arkansas savory, baby's-breath, brown-eyed susan, canary grass, coneflower, corn-salad, false aloe, green-thread, Indian plantain, sandwort, stonecrop,

twist-flower, white heliotrope, wind-flower, wild geranium, and wild onion. Grasses include dropseed, bluestem, grama, and fescue. Trees and shrubs found at glade edges include red cedar, buckeye, dogwood, sugar hackberry, sweetgum, and white ash.

The gladecress was historically recorded at 8 sites in east Texas. It has been more recently restricted to 5 locations, all in San Augustine County (and an introduced population at a site in Nacogdoches County). Two of these locations have since been lost to glauconite mining. One historic site (Geneva) in Sabine County (adjacent to San Augustine County on the east) was re-discovered in 1998 and found to support over 300 plants. However, this site has since been destroyed by the landowner. No gladecress have been seen in recent years at other white bladderpod sites (Goetz, Blount #2, Miley, Watts, Williams #1 and #2). Gladecress appear to be restricted in occurrence to the outcrops themselves, as opposed to the bladderpod, which can colonize a substantial area surrounding an outcrop. This factor may render the gladecress even more imperiled than the bladderpod, which is currently listed as endangered.

Known sites are now restricted to two in San Augustine County, and an introduced population in Nacogdoches County. [A third site (Haley) in San Augustine County is currently closed to visitors, and its status is unknown.]

1)Tiger Creek (Chapel Hill) site - less than 1/4 acre (0.1 hectare) between pasture fence and gravel road 1 mile southwest of Highway 21: 91 plants in 1998; 67 in 2000 (drought conditions); 200 in 2001; 96 in 2002.

2)Kardell site - less than 100 square feet (9 square meters) on south side of Sunrise Road 0.7 miles south of Highway 21: 490 plants in 1998; 96 in 2000; 290 in 2001; 500 in 2002.

3)Introduced site - about 200 square feet (18 square meters) 3 miles east of Nacogdoches on north side of Highway 21: 270 plants in 2001; 300 in 2002.

#### THREATS:

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

Gladecress habitat has been impacted by highway construction, residential development, conversion to pasture and cropland, widespread use of herbiciding, and over-grazing. Two sites have been lost to glauconite mining. However, the primary current threat to gladecress habitat is the continued and expanding invasion of non-native and weedy shrubs and vines into Weches glades, converting them to dense shrub-thickets. The most serious invaders are Macartney rose and Japanese honeysuckle, but also include Japanese brome and bush-clover, privet, bermuda-grass, broomsedge, spurge, viburnum, and treebine. Control measures (brush-clearing) carried out in 1995 resulted in reappearance of the gladecress after a 10-year absence at one historic site, and its discovery at a second site. Future control measures could have a similar effect at other historic locations. Some of these sites may also be newly vulnerable to the establishment of concentrated chicken production operations. Many of these operations have been recently established in San Augustine and adjacent counties but, to date, none of them immediately near gladecress sites. However, this could change.

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

None known.

C. Disease or predation.

One current and four historic sites are currently used for cattle grazing, placing the populations at risk to predation and trampling.

D. The inadequacy of existing regulatory mechanisms.

All populations are on private land, which receive little protection. The Service is currently denied access to one site, resulting in unknown status. Another site is currently grazed, with unknown impact. Protection measures for all plants are limited to some degree in Texas because of the large proportion (97 percent) of private land and the lack of State regulation of rare species.

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

Known gladecress sites are being heavily impacted by invasion of non-native shrubby species, resulting in the loss of unique wetlands. All sites remain vulnerable to conversion to cropland or range, over-grazing, glauconite mining, and concentrated animal feeding operations (CAFO=s). With only two sites of known status, the possibility of succumbing to some man-made or natural event is high. A drought during 1999 and 2000 had a pronounced effect on gladecress reproduction (Tiger Creek site declined from 91 to 67, and Kardell from 490 to only 96). Unless new populations can be discovered and protected by some measure, the gladecress will remain in danger of extinction.

BRIEF SUMMARY OF REASONS FOR REMOVAL OR LISTING PRIORITY CHANGE:

FOR RECYCLED PETITIONS: N/A

- 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): 100 % **B** private land.

PRE-LISTING (Describe status of conservation agreements or other conservation activities):

This plant occurs within the same habitat system as the white bladderpod (*Lesquerella pallida*), which is federally listed as endangered. Management activities (brush-clearing) carried out in 1995 for the bladderpod resulted in a return of the gladecress to one site after a 10-year absence, and its discovery at a second location. However, non-native shrubs have again invaded these sites, limiting gladecress and bladderpod numbers.

Field Office funds have recently been allocated to The Nature Conservancy of Texas (TNC) to conduct a status survey of the gladecress and implement protection measures where possible, but complete information and success may be restricted by lack of landowner access. GPS coordinates for existing sites has been determined and each site monitored for 3 years.

2)TNC identified a total of 44 potential sites of occurrence with the use of GIS data, including aerial, geologic, and hydrologic data sources. Access was granted for about 14 of these sites, but almost no Weches habitat, and no new gladecress populations, were discovered. Progress is hampered by the absence of a comprehensive soil survey for San Augustine County. The designation of soil series and soil map units along the Weches formation is probably the most crucial need in effectively locating new habitat.

3)For the first time, a substantial number of gladecress seeds have been collected. Seeds have been distributed to three state horticultural labs and to the National Seed Storage Lab. A Conservation Agreement between our office and Stephen F. Austin State University (SFASU) has facilitated propagation efforts at their new Pineywoods Native Plant Center for cultivation, research, long-term storage, and seed source for reintroduction efforts.

4)A Cooperative Agreement with The Nature Conservancy is facilitating development of a comprehensive conservation plan for Weches glades and conservation plans for each bladderpod and gladecress site. An April 2002 meeting intended to initiate this process involved representatives of all local and state agencies and organizations that affect bladderpod and gladecress sites. Specific strategies for protecting, restoring and managing gladecress habitat were discussed and prioritized.

5)A draft of the proposed Conservation Area Plan for the San Augustine Glades has been completed and distributed to all parties for review and comment. When completed, the plan is intended to determine the size and configuration of functional conservation units that will restore and maintain long-term viability of Weches communities. This is a vital step toward recovery and preservation of this rare habitat. However, the next step will be securing adequate funding to initiate protection measures.

## REFERENCES

Texas Natural Heritage Program element occurrence records.

George, R.J., and E.S. Nixon. 1990. The herbaceous flora of three Weches formation

outcrops in eastern Texas. Sida 14(1):117-127.

Mahler, W.F. 1981. Notes on rare Texas and Oklahoma plants. Sida 9:76-86.

Mahler, W.F. 1987. *Leavenworthia texana*, a new species from Texas. Sida 12:239-242.

LISTING PRIORITY (place \* after number)

THREAT
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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:* The gladecress historically occurred at at least 8 sites in east Texas. It is now restricted to three sites involving a total area of less than a half-acre, and a total population ranging from as low as 163 to a maximum of 1000. Since they occur on private land, all sites are vulnerable to conversion to cropland or range or glauconite mining.

*Imminence:* All known sites are undergoing immediate degradation by the incursion of non-native shrubs and vines, preventing growth and reproduction of the gladecress. One site is treated by herbicides each year, with unknown effect. All known sites remain vulnerable to loss due to a potential change in land use, including improved pasture, cropland, and establishment of poultry CAFO=s. With only three known sites, the gladecress remains extremely vulnerable to any natural event. A drought during 1999 and 2000 had a pronounced effect on gladecress reproduction. Unless existing and new populations are adequately protected, the gladecress will remain in immediate danger of extinction.

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: Tom Bauer March 14, 2003  
Acting Regional Director, Fish and Wildlife Service Date

Concur: \_\_\_\_\_  
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 14, 2003

Conducted by: Kathy Nemec - Clear Lake (Houston) Field Office, Region 2

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_