

CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME:

Chamaesyce deltoidea (Engelm. ex Chapm.) Small ssp. serpyllum (Small) D.G. Burch

COMMON NAME: wedge sandmat or wedge spurge

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: \_\_\_\_

    New LP: \_\_\_\_

Latest date species first became a Candidate: \_\_\_\_\_

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 *A*species.@

X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Plant - Euphorbiaceae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Florida

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Florida

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

LEAD FIELD OFFICE CONTACT (Office, name, phone number): South Florida Field Office, Paula Halupa, 561/562-3909 extension 257

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

Chamaesyce deltoidea ssp. serpyllum is a small prostrate perennial herb. The stems are slender and numerous, radiating out from the tap root. The leaves are more or less triangular. The

Flowers are cyathia, the specialized inflorescences characteristic of the genus *Euphorbia* and its close relatives. Wedge sandmat is known only from pine rockland vegetation on Big Pine Key, Monroe County, Florida (Small 1933, Long and Lakela 1971, Wunderlin 1998, Ross and Ruiz 1996). The current and historic ranges are similar. This species occurs on the edges of hammocks and pinelands. It is shade intolerant and requires periodic burning to reduce competition from woody vegetation. The total number of individuals has been estimated to be fewer than 10,000 plants at only six sites. Most known plants occur on the National Key Deer Refuge, with approximately 1,000 or fewer plants occurring on unprotected, privately-owned lands within the vicinity of the refuge (Ross and Ruiz 1996; Bradley and Gann, pers. comm. 1999). The species is also present on a 20-acre preserve owned by The Nature Conservancy (Gann et al. 2002)

Pine rocklands on the National Key Deer Refuge at Big Pine Key encompass approximately 400 hectares (ha) (1,000 acres) of the refuge (3,300 ha (8,200 acres (ac))). Ross and Ruiz (1996) found *Chamaesyce deltoidea* ssp. *serpyllum* only in study transects in the northern and eastern portions of the island. Given the species' narrow habitat range, and small number of individuals that occur, *Chamaesyce deltoidea* ssp. *serpyllum* is vulnerable to extinction.

**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.

Acreage of pine rocklands on Big Pine Key was reduced from 1,049 ha (2,592 acres) in 1955 to 701 ha (1,732 acres) in 1989 (Folk 1991). This results in a loss of approximately 33 percent of habitat. A significant amount of pine rockland habitat in the Keys is still threatened by development (C.R. Kruer, pers. comm. 1998). Based on the number of humans moving to Florida, pressures from development are not expected to diminish in the years to come, especially throughout the range of *Chamaesyce deltoidea* ssp. *serpyllum*. Florida had experienced a 15.3 percent increase in the human population from April 1, 1990, to July 1, 1998, and was ranked as the fourth fastest growing state in the nation during 1998 (U.S. Census Bureau 1998).

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

None are known.

C. Disease or predation.

None are known.

D. The inadequacy of existing regulatory mechanisms.

The Florida Department of Agriculture and Consumer Services has designated Chamaesyce deltoidea, which includes ssp. serpyllum and two other subspecies, as endangered under Chapter 5B-40, Florida Administrative Code. This listing provides little or no habitat protection beyond the State=s Development of Regional Impact process, which serves to disclose impacts from projects, but provides no regulatory protection for State-listed plants on private lands. Without local or county ordinances preventing the destruction of the plant, conservation does not occur.

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

Fire suppression and exotic plant invasions are the biggest threats to Chamaesyce deltoidea ssp. serpyllum. Fire is required to maintain the pine rockland community. Under natural conditions, lightning fires typically occurred at 3- to 7-year intervals. With fire suppression, hardwoods eventually invade pine rocklands and shade out understory species like Chamaesyce deltoidea ssp. serpyllum. Fire suppression has reduced the size of the areas that do burn and habitat fragmentation has prevented fire from moving across the landscape in a natural way. Thus, many pine rockland communities have moved past their normal fire subclimax and are succeeding to tropical hardwood hammock communities. Currently, experimental fire regimes are being conducted on the National Key Deer Refuge on Big Pine Key. The Service is working cooperatively with Florida International University in Miami to determine the proper fire frequencies necessary to maintain the pine rockland community on the refuge. The fire management activities are designed to induce two burns per year for 2 years, at 8 ha (20 ac) a year. This management plan is designed for the endangered Key Deer (Odocoileus virginianus clavium), and the threatened garber=s spurge (Chamaesyce (= Euphorbia) garberi, which utilize the pine rockland ecological community. Chamaesyce deltoidea ssp. serpyllum may benefit from the refuge=s fire management plan.

Exotic plants have significantly affected pine rocklands. At least 277 taxa of exotic plants are now known to invade pine rocklands in South Florida (U.S. Fish and Wildlife Service 1998). Some of these may compete directly with Chamaesyce deltoidea ssp. serpyllum for space and resources, while others have a profound effect on community structure and responses to fire. The exotic tree, Brazilian pepper (Schinus terebinthifolius) is the most widespread and one of the most invasive species. If left uncontrolled in a fire-suppressed pineland, it will form a dense monospecific canopy almost completely eliminating native vegetation. Earleaf acacia (Acacia auriculiformis), natal grass (Rhynchelytrum repens), shrub verbena (Lantana camara), and woman=s tongue tree (Albizia lebeck) are some of the other exotic pests in pine rocklands. All of these species affect the characteristics of a fire when it does occur. Fires that once burned fairly coolly with mostly pine needle duff for fuel may now burn much hotter and affect the vegetation that develops following fire. For instance, a catastrophic fire may cause grasses to die out and be replaced by bracken fern thickets. Therefore, with the presence of exotic species, it is uncertain just how a managed fire regime will affect Chamaesyce deltoidea ssp. serpyllum.

Based on the low number of individuals within its narrow range, catastrophic events such as hurricanes and tropical storms may negatively affect Chamaesyce deltoidea ssp. serpyllum. Either event could extirpate remaining 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):

Chamaesyce deltoidea ssp. serpyllum can be found within the 400.5-ha (1,000-ac) pine rocklands portion of the 3,321-ha (8,200-ac) National Key Deer Refuge. Although it probably occurs on other preserved sites on Big Pine Key, this needs to be documented. Other known populations are on private lands near the National Key Deer Refuge and are not protected.

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

In association with the Florida International University, the public university in Miami, the National Key Deer Refuge on Big Pine Key is conducting a 2-year control burn study to determine proper fire regimes for Key deer, which utilize pine rocklands. Although conservation activities on the refuge are not targeting Chamaesyce deltoidea ssp. serpyllum, the species may benefit because it occupies habitat utilized by the Key deer.

The Service has developed a multi-species recovery plan for the threatened and endangered species of South Florida. This plan is ecosystem-based and includes many recommendations for conservation of the pine rockland community (U.S. Fish and Wildlife Service 1998).

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

Folk, M.L. 1991. Habitat of the Key deer. Ph.D. dissertation. Southern Illinois University, Carbondale.

Gann, G.D., K.A. Bradley, and S.W. Woodmansee. 2002. Rare Plants of South Florida: Their History, Conservation, and Restoration. Institute for Regional Conservation, Miami. 1056 pages.

Kernan, C. and K. Bradley. 1996. Conservation survey of Linum arenicola in Dade County. A report to the U.S. Fish and Wildlife Service. Fairchild Tropical Garden, Miami, Florida.

Long, R.W. and O. Lakela. 1971. A flora of tropical Florida; a manual of the seed plants and ferns of southern peninsular Florida. University of Miami Press, Coral Gables, Florida.

Ross, M.S. and P.L. Ruiz. 1996. A study of the distribution of several South Florida endemic plants in the Florida Keys. A report to the U.S. Fish and Wildlife Service. Southeast Environmental Research Program, Florida International University, Miami, Florida.

Small, J.K. 1933. Manual of the southeastern flora. University of North Carolina Press, Chapel Hill. 1554 pp.

The Nature Conservancy, Conservation Science Division, in cooperation with The Association for Biodiversity Information, and the International Network of Natural Heritage Programs and Conservation Data Centers. 1999. Biodiversity Conservation Data Source (BioSource). Arlington, Virginia.

U.S. Census Bureau. 1998. State and Metropolitan Area Data Book 1997-1998.

U.S. Fish and Wildlife Service. 1998. Draft multi-species recovery plan for South Florida, volume II; pine rocklands. Vero Beach, Florida.

Wunderlin, R.P. 1998. Guide to the vascular plants of Florida. University press of Florida, Gainesville. 806 pp.

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:* This subspecies has a very narrow distribution in pinelands of Big Pine Key. Most of the plants are on Key Deer National Wildlife, the rest on private land.

*Imminence:* The Refuge has a prescribed fire program appropriate for the conservation of this fire-dependent plant and is considering alternative mechanical treatments for hard-to-burn areas. As a result, habitat management problems are long-term rather than immediate.

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: \_\_\_\_\_ Date \_\_\_\_\_  
Director, Fish and Wildlife Service

Do not concur: \_\_\_\_\_ Date \_\_\_\_\_  
Director, Fish and Wildlife Service

Director's Remarks:

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Date of annual review: February 2003

Conducted by: David Martin - South Florida Ecological Services Office

Comments:

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