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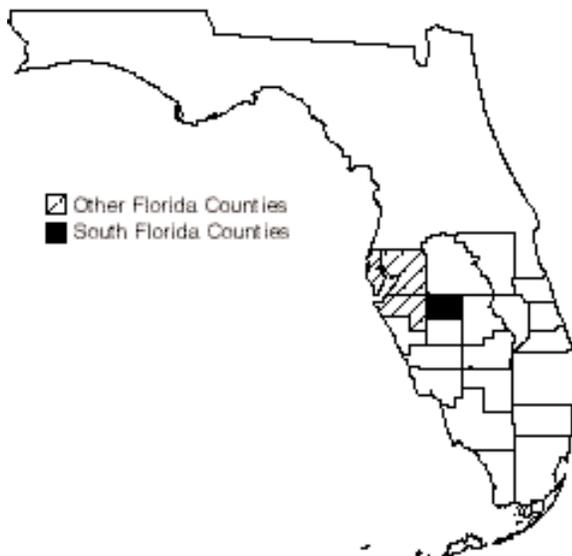
# Florida Golden Aster

*Chrysopsis (=Heterotheca) floridana* Small

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Federal Status:	Endangered (May 16, 1986)
Critical Habitat:	None Designated
Florida Status:	Endangered
Recovery Plan Status:	Contribution (May 1999)
Geographic Coverage:	South Florida

Figure 1. County distribution of the Florida golden aster.



The Florida golden aster is a perennial herb in the aster family with a distribution limited to a few counties in west-central Florida. The Florida golden aster occurs in sand pine and oak scrub or in disturbed areas at the edges of scrub.

This account represents South Florida's contribution to the existing recovery plan for the Florida golden aster (FWS 1988).

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## Description

*Chrysopsis floridana* is a perennial herb with stems that are woody toward the base and non-woody above. The plants have basal rosettes (clusters of leaves at ground level) with leaves 4 to 10 cm long, 1.5 to 2.0 cm wide; the leaves of the rosette are densely short-wooly pubescent. The stem leaves are nearly the same size from the top to the bottom of the stem; they are obovate-elliptic, slightly clasping the stem, entire, and densely short-wooly pubescent. The flower heads are grouped into a more or less flat-topped cluster of 1 to 25 heads at the top of the stem. Each head is slightly over 2.5 cm in diameter. Both the central disc and the rays are golden yellow. *C. floridana* is distinguished from other members of its genus by its perennial habit, the woodiness of its stems, the wooliness and the shape of the stem and the leaves, and the way the flower heads are arranged in a flat-topped cluster (Semple 1981, Wunderlin *et al.* 1981).

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## Taxonomy

This species was first described by John K. Small in 1903 as *Chrysopsis floridana*. However, M. L. Fernald (1937) described this plant as *Chrysopsis mariana* var. *floridana*. V. Harms (1963) proposed the nomenclature as *Heterotheca mariana* subsp. *floridana*. R. W. Long (1970) provided another synonym, *Heterotheca floridana*. Cronquist (1980) considered it synonymous with the more common *Chrysopsis scabrella*. However, in 1981, J. C.

Semple returned *Chrysopsis floridana* to its original status as a separate species. Several other authors have also recognized it as a distinct species (Lakela *et al.* 1976, Ward 1979, Wunderlin 1982).

### Distribution

Because information on distribution of *C. floridana* is derived from relatively few collections that were made prior to extensive urbanization of the Tampa Bay area, it is impossible to completely define its historic distribution. The species is presently known to occur in Pinellas, Hillsborough, Manatee, and Hardee counties (Figure 1).

*Chrysopsis floridana* was first collected in 1901 at Bradenton in Manatee County, Florida, by S. M. Tracy. Specimens from this collection were described in 1903 by John K. Small (Small 1903). Small subsequently collected the species in Pinellas County in 1921 and in Hillsborough County in 1924. Small's collections in 1921 included a specimen from dunes on Long Key (St. Petersburg Beach), Pinellas County, indicating that the original range of the species included dunes along the Gulf of Mexico (Wunderlin *et al.* 1981). The species was not collected again until 1953 by W. J. Dress in Hillsborough County. Ward (1979) reported that the species was restricted to two populations in Hillsborough County and that the population previously reported in Pinellas County was now a heavily urbanized area and was considered quite likely extirpated. A status survey by Wunderlin *et al.* (1981) reported the distribution of *C. floridana* was limited to several sites in central and southern Hillsborough County; population sizes ranged from one to several hundred individuals. *C. floridana* is known to occur in Lake Manatee SRA, Manatee County (Lambert and Menges 1996).

R.D. Wunderlin of the University of South Florida has herbarium specimens of *C. floridana* collected in 1987 by K. DeLaney from three sites in southeastern Hardee County, in the vicinity of Sweetwater, which places a portion of its range in the boundaries of the South Florida Ecosystem. These three sites are present in the Florida Natural Areas Inventory's database, but more recent surveys by DeLaney are not (Florida Natural Areas Inventory 1997). Wunderlin recalls that very few specimens were present at any of the sites and that there was evidence of trampling by cattle (R. Wunderlin, University of South Florida, personal communication 1997). However, more detailed information on the distribution of *C. floridana* in Hardee County, or the threats the species may face there, has not been published and is not available at this time to the FWS (K. DeLaney, Environmental Research Consultants, Inc., personal communication 1996). DeLaney reports that *C. floridana* has been eliminated from two sites he previously documented in Hardee County (K. DeLaney, Environmental Research Consultants, Inc., personal communication 1997). The FWS does not know how many sites if any remain in Hardee County (additional sites may be present in Hardee County beyond the three represented by Wunderlin's specimens).

**Florida golden aster flower.**  
Original photograph by Steve Shirah.



### Habitat

Although a majority of South Florida's endemic scrub plants are found on the Lake Wales Ridge, *C. floridana* occurs west of the Lake Wales Ridge, on lower ridges formed during the late Miocene epoch. *Chrysopsis floridana* is associated with the excessively drained soils characteristic of sand pine scrub, such as Archbold fine sands, St. Lucie fine sands, Lakewood fine sands, Duette fine sands, and Pomello fine sands (Wunderlin *et al.* 1981, Lambert and Menges 1996). All of these soils are extremely nutrient-poor and well-drained and are composed primarily of siliceous sand.

*Chrysopsis floridana* prefers open, sunny areas within the sand pine scrub community. The dominant overstory trees include sand pine (*Pinus clausa*), scrub live oak (*Quercus geminata*), bluejack oak (*Q. incana*), Chapman's oak (*Q. chapmanii*), and myrtle oak (*Q. myrtifolia*). The shrub layer occurs in thickets 1 to 2 m high. The dominant species are tarflower (*Befaria racemosa*), staggerbush (*Lyonia fruticosa*), saw palmetto (*Serenoa repens*), pawpaw (*Asimina reticulata*), and hog plum (*Ximenia americana*). The herbaceous layer usually includes wireweed (*Polygonella ciliata*), blazing star (*Liatrix tenuifolia*), wiregrass (*Aristida beyrichiana*), deer's tongue (*Carphephorus corymbosus*), queen's delight (*Stillingia sylvatica*), prairie clover (*Dalea feayi*), and several species of lichens (Wunderlin *et al.* 1981).

*Chrysopsis floridana* was known to occur historically in scrub habitat on coastal dunes, and the species has been reintroduced to this habitat type at Ft. Desoto County Park, Pinellas County. Dominant vegetation surrounding the small patch (approximately 24 plants) of *C. floridana* includes scrub live oak, slash pine (*Pinus elliottii*), and rosemary (*Ceratiola ericoides*) (D. Chayet, Pinellas County Parks Department, personal communication 1997). More detailed analysis should identify any differences in soil, species composition,

and habitat structure, between these dunes at Ft. Desoto County Park and the scrub habitats where *C. floridana* is present farther inland.

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### Reproduction

*Chrysopsis floridana* flowers in late November and December and sheds seed from December onward. This plant can spread vegetatively by forming new basal rosettes at the ends of rhizomes, but reproduction is primarily by seed (FWS 1988). The entire genus has an out-crossing breeding system. In the sand pine scrub vegetative community, *C. floridana* colonizes areas of sunny, bare sand. Lambert and Menges (1996) found that seedling emergence was increased by disturbed soil, by the absence of a litter layer and by their combination. However, seedling survival was not affected by those experimentally controlled factors. Fire did not affect seed germination or seedling survival, but did increase flowering.

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### Relationship to Other Species

Little information is available on the relationship of the Florida golden aster to other species. Shading by overly dense canopy species will result in reduced population size, and will ultimately eliminate *C. floridana* from the understory. No information is available on pollinators. Lambert and Menges (1996) reported that the disturbance of soil by an ant mound (species not reported) favored germination of *C. floridana*, as did rooting by armadillos (*Dasyops novemcinctus*). Gopher tortoise (*Gopherus polyphemus*) burrows are also known to provide areas of disturbed soil suitable for germination of many scrub species. *C. floridana* may also be confused with *C. scabrella* in the field.

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### Status and Trends

*Chrysopsis floridana* was recognized in 1979 as an endangered species by the Florida Committee on Rare and Endangered Plants and Animals (Ward 1979), but this provided no legal protection for the species. *Chrysopsis floridana* was listed as endangered under the Endangered Species Act on May 16, 1986 (51 FR 17977); the listing rule cited the limited distribution of the species and the threats of residential and commercial development of its habitat, mowing, intense grazing, and heavy use of off-road vehicles as the causes for endangerment. At that time, all known populations of *C. floridana* occurred on lands that were in private ownership.

*Chrysopsis floridana* is now known to occur on several protected and managed sites. *Chrysopsis floridana* has been successfully reintroduced in sand pine scrub habitat within Boyd Hill Nature Park in Pinellas County (G. Costen, Boyd Hill Nature Park, City of St. Petersburg, personal communication, 1996) and has been grown from seed in scrub at Fort Desoto SP, which is close to the shore of the Gulf of Mexico (D. Chayet, Pinellas County Parks Department, personal communication 1997). Lambert and Menges (1996) reported that the species grew at Lake Manatee SRA, and at an unnamed site acquired by Hillsborough County. Hillsborough County has now acquired several parcels through their Environmental Lands Acquisition and

Protection Program (cost sharing with the SWFWMD or the CARL program) that support populations of *C. floridana*. Hillsborough County also has acquired lands without cost sharing, and in addition shared costs with the Florida Communities Trust. As of January 1997, the species was located on seven county properties; the largest of these are the 2,024-ha Balm-Boyette Scrub and the 520-ha Golden Aster Scrub (J. Lehman, Hillsborough County Parks and Recreation Department, personal communication 1997, DEP 1995).

Lambert and Menges (1996) reported that the population size of *C. floridana* ranged between 90 and 185 individuals in two quadrats at Lake Manatee SP between February 1990 and November 1992; they noted considerable turnover from both mortality and recruitment. Information on population sizes and trends in Hardee County has been collected, but has not yet been published (K. Delaney, Environmental Research Consultants, Inc., personal communication 1997).

*Chrysopsis floridana* is known to occur on railroad and highway rights-of-way in Hillsborough County, making it vulnerable to the management practices surrounding transportation corridors and possible widening of these corridors (Wunderlin *et al.* 1981, FWS 1988). Where *C. floridana* occurs on private lands, threats of human activity include mowing, dumping, vehicular traffic, and land clearing (Ward 1979, Wunderlin *et al.* 1981, FWS 1988). The FWS has no information on the distribution of *C. floridana* in Hardee County. This information is needed to determine the present land uses, assess regional and county comprehensive land use plans, and to address threats to the species in Hardee County.

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## Management

Because the FWS currently has no specific information on the distribution of *C. floridana* and threats to its survival in Hardee County, this section is based on our knowledge of management issues in Hillsborough, Pinellas, and Manatee counties. Obtaining information on the species' distribution, its relation to current and proposed land use patterns, and current and potential threats in Hardee County would be the highest priority for protection of that portion of the species' range within the South Florida Ecosystem.

Based on the threats observed in nearby counties, it is likely that current and future threats to scrub habitat in Hardee County will include residential and agricultural development, highway projects, mowing, lack of fire management in scrub, use of off-road vehicles, and dumping of trash in scrub. Acquisition of scrub habitat containing *C. floridana* in Hardee County would allow proper management of these tracts, as has been initiated on public lands in Hillsborough County. Because Hardee County has extensive areas of improved pasture and unimproved pasture, we consider important an assessment of the effect of cattle grazing on *C. floridana* habitat. Based on this information, we will be able to provide management recommendations to cattle ranchers to protect *C. floridana* on private property.

Controlled burning is an important management tool for recovery of *C. floridana*, because plants that occupy open sandy areas in scrub habitat rely on periodic fire to prevent canopy closure. Lambert and Menges (1996) reported

a prescribed burn in Boyd Hill Nature Park during their germination experiments. It was a fast cool fire which did not open the cones of sand pines in its path. The fire did not affect germination of *C. floridana* nor seedling survival, but it did increase flowering by mature plants in the burned quadrats the following year. Lambert and Menges (1996) were unable to study the long-term effects of the fire, but based on observations from similar scrub habitats, they recommend that prescribed burning mimic the natural cycle of the cover type being managed, with frequent burns (1 to 10 years) in transitional or sandhill areas and burns every 10 or more years in scrub areas themselves. They also recommend burning in late spring and summer, when lightning-generated fires tended to occur naturally, which would also be after *C. floridana* seeds have been dispersed. Personnel from Boyd Hill Nature Park indicate that two controlled burns have occurred there since reintroduction of *C. floridana* to the park in 1989 (G. Costen, Boyd Hill Nature Park, City of St. Petersburg, personal communication 1996). They have found controlled burns can be conducted successfully despite the relatively small size (99 ha) of the park and the dense urban development surrounding the park. They attribute this to careful planning for the burns and the presence of a lake adjacent to the park, which buffers the area from the adjacent urban area. This is encouraging for the likelihood of successful prescribed burns in Hardee County, which is less urbanized than Pinellas County. Controlled burning has also been used to manage *C. floridana* habitat on property belonging to Hillsborough County (J. Lehman, Hillsborough County Resource Management, personal communication 1997) and at Lake Manatee SRA and Little Manatee River SRA, both of which are owned by DEP in Manatee County (R. Hattaway, DEP, personal communication 1997).

Land managers have expressed concerns about invasion of exotic grasses in *C. floridana* habitat, particularly since prescribed burning alone may not be sufficient to prevent this invasion. Cogon grass (*Imperata cylindrica*) is a widespread exotic species that is invading the habitat of *C. floridana* in Hillsborough County (S. Bowman, Hillsborough County Parks and Recreation Department, personal communication 1996). In addition to crowding out native vegetation, cogon grass may also alter fire intensities in areas invaded (Schmitz 1994). At Boyd Hill Nature Park, Bermuda grass (*Cynodon dactylon*) has invaded scrub habitat from an adjacent athletic field (G. Costen, Boyd Hill Nature Park, City of St. Petersburg, personal communication 1996). An effective treatment of these grasses without damage to the native scrub plants should be devised for the long-term management of scrub habitats containing *C. floridana*.

Cultivation of *C. floridana* and transplantation of cultivated specimens to natural areas has been an effective recovery action; this type of action is not limited by difficulties in cultivating the aster (Wallace 1988, T. Race, Bok Tower Gardens, personal communication 1997), but it is limited by the small number of remaining suitable scrub habitats in the limited range of the species. The species was reintroduced to Boyd Hill Nature Park in 1989 from plants cultivated at Bok Tower Gardens (G. Costen, Boyd Hill Nature Park, City of St. Petersburg, personal communication 1996). The aster was also successfully reintroduced to

Fort Desoto County Park from wild-collected seeds (D. Chayet, Pinellas County Park Department, personal communication 1997). Because the aster has a high germination and survival rate, dispersal of seed is a preferred method of introducing the aster rather than germinating plants in a greenhouse and subsequent planting in the field (T. Race, Bok Tower Gardens, personal communication 1997).

L. Markham of the University of South Florida has initiated DNA analysis on *C. floridana* to determine the amount of genetic variability across the species' range. This will provide information for decisions on land acquisition and plant introduction to ensure we are protecting the full range of genetic variability in the remaining population. There is a concern that the plants reintroduced to sites in Pinellas County are all derived from the same genetic stock, which was collected at the Shadow Run Subdivision in Hillsborough County (R. Wunderlin, University of South Florida, personal communication 1997).

In South Florida, conducting surveys to determine if the aster still exists is the most immediate recovery need for this species. Once we have identified and confirmed locations for this species in South Florida, we can develop specific management actions to recover the species.

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# Recovery for the Florida Golden Aster

*Chrysopsis (=Heterotheca) floridana* Small

**Recovery Objective:** RECLASSIFY to threatened.

**South Florida Contribution:** CONDUCT SURVEYS to ascertain presence in South Florida.

## Recovery Criteria

The best scientific information available raises questions about whether the Florida golden aster occurs within the geographic boundaries of the South Florida Ecosystem. Unless new information demonstrates that this species occurs in South Florida, no recovery criteria will be developed or proposed as part of this recovery plan.

## Species-level Recovery Actions

- S1. Determine the distribution for *C. floridana* in South Florida.
  - S.1.1. Conduct surveys for *C. floridana* in suitable sand pine and oak scrub habitat in Hardee County.

