

## DEPARTMENT OF THE INTERIOR

## 50 CFR Part 17

## Endangered and Threatened Wildlife and Plants; Proposed Endangered or Threatened Status for Seven Florida Scrub Plants

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Proposed rule.

**SUMMARY:** The Service proposes endangered status pursuant to the Endangered Species Act of 1973 (Act), as amended for the following six plants: *Chionanthus pygmaeus* (pygmy fringe tree), *Eryngium cuneifolium* (snakeroot), *Hypericum cumulicola* (Highlands scrub hypericum), *Polygonella basiramia* (wireweed), *Prunus geniculata* (scrub plum), and *Warea carteri* (Carter's mustard). The Service proposes threatened status for one plant, *Paronychia chartacea* (papery whitlow-wort). Critical habitat is not proposed. These seven species are restricted to sand pine-evergreen oak scrub vegetation in south-central peninsular Florida. All known populations of these plants are on private property, highway rights-of-way, or State park land. These species are endangered or threatened primarily by development of their scrub habitat for agricultural and residential purposes. This proposal, if made final, would implement the Federal protection and recovery provisions afforded by the Act for these plants. The Service seeks data and comments from the public on this proposal.

**DATES:** Comments from all interested parties must be received by June 9, 1986. Public hearing requests must be received by May 27, 1986.

**ADDRESSES:** Comments and materials concerning this proposal should be sent to the Field Supervisor, Endangered Species Field Station, 2747 Art Museum Drive, Jacksonville, Florida 32207. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

**FOR FURTHER INFORMATION CONTACT:** David J. Wesley, Endangered Species Field Supervisor, at the above address (904/791-2580 or FTS 946-2580).

**SUPPLEMENTARY INFORMATION:****Background**

Scrub vegetation (locally referred to as scrub) consisting of sand pine (*Pinus clausa*) with shrubby evergreen oaks is restricted to Florida, where it is widespread, and the Gulf coast of Alabama. Southeastern Georgia has evergreen oak scrub without sand pine

(Wharton 1978). The major evergreen scrub oaks are myrtle oak (*Quercus myrtifolia*), Chapman oak (*Quercus chapmanii*) and sand live oak (*Quercus geminata*). Scrub vegetation is found along the Florida coasts and on the sand ridges of the interior of the Florida peninsula. Scrub is one of the most distinctive natural communities of Florida, both on the coasts and inland. Scrub often occupies ancient sand dunes (White 1958), but it also occupies sand soils similar to those with longleaf pine (*Pinus palustris*)—turkey oak (*Quercus laevis*)—wiregrass (*Aristida spp.*) vegetation. Scrub is the primary or only habitat where a number of plants and animals exist. These animals include the Florida scrub jay (*Aphelocoma coerulescens coerulescens*), the Florida scrub lizard (*Sceloporus woodi*), blue-tailed mole skink (*Eumeces egregius lividus*), and the sand skink (*Neoseps reynoldsii*). These four animals are candidates for Federal listing under the provisions of the Act. The following endemic plants of Florida scrub vegetation are already listed, or proposed for listing under provisions of the Act: *Chrysopsis floridana*, *Dicerandra cornutissima*, *Dicerandra frutescens*, *Dicerandra immaculata*, and *Asimina tetramera*. Other scrub plants are candidates for listing, including *Polygonella macrophylla* in the Panhandle, *Liatris ohlingerae* in Polk and Highlands Counties, and *Polygonella myriophylla* and *Lupinus aridorum* in Lake, Orange, and Polk Counties.

The southernmost interior scrubs are on the Lake Wales Ridge in Polk and Highlands Counties, an area that includes the cities of Lake Wales, Avon Park, Frostproof, Sebring, and Lake Placid, and extends south as far as the small town of Venus. The Scrub vegetation of these counties is distinctive for having relatively little sand pine (Abrahamson *et al.* 1984), and for its rich endemic flora (Ward 1979b, Judd and Hall 1984), including the very abundant *Quercus inopina* (inopina oak), a shrubby evergreen oak. Other endemic shrubs include *Chionanthus pygmaeus*, *Prunus geniculata*, and the apparently extinct *Ziziphus celata* (Judd and Hall 1984). The other endemic scrub plants are perennial or annual herbs. Highlands County has more scrub endemics than Polk, but in both counties, the scrub vegetation is varied, and some scrubs have more endemic species present than others. In Highlands County, some scrub sites have four or five of the endemic plants from the present proposal, while others have none (Stout 1982).

Sand pine scrub burns infrequently, roughly every 30–80 years, but fires in scrub can be intense. Most of the shrubs renew themselves from root sprouts, similar to the shrubs in Southeastern pocosins (evergreen shrub bogs) or California chaparral. Sand pine and rosemary (*Ceratiola ericoides*) reoccupy burned scrub only by seed. Rosemary seedlings typically appear 3 years after a fire (Abrahamson *et al.* 1984); mature rosemary approaches senescence at an age of 30–35 years (Johnson 1982), and rosemary is thus characteristic of early vegetation development in scrub. It and some other scrub plants release toxic chemicals into the soil that inhibit or prevent the growth of most other plants, resulting in areas of relatively bare, open sand between the shrubs. A few annual and perennial herbs tolerate the toxic chemicals and inhabit the otherwise bare sand. These include the following species from the present proposal: *Eryngium cuneifolium*, *Hypericum cumulicola*, *Paronychia chartacea*, *Polygonella basiramia*, and *Warea carteri*. *Liatris ohlingerae* and *Calamintha ashei*, also candidates for Federal listing, are also typical of such habitats. The bare sand areas diminish as rosemary dies out, so these herbs, like rosemary, are characteristic of early vegetation development in scrub, and are often absent from later stages. The bare sand areas are ephemeral habitats, created by fire or brush removal and maintained by toxic chemicals; without fire or brush removal, they disappear after 20–30 years (Richardson 1985). The herbs that inhabit the open sand can form large populations, but these populations will die out unless the habitat is renewed.

There are four biological preserves and one Federal installation containing scrub in the southern Lake Wales Ridge: Tiger Creek Preserve southwest of Lake Weohyakapka and Lake Arbuckle Preserve east of Frostproof, both of which belong to The Nature Conservancy (Polk County); the U.S. Air Force's Avon Park Bombing Range (Polk County), which contains small tracts of sand pine scrub vegetation but has none of the plant species treated in the present proposal (Wunderlin *et al.* 1982); Highlands Hammock State Park (Highlands County); and the privately owned Archbold Biological Station south of Lake Placid (Highlands County). Archbold has been thoroughly studied and is the richest of the preserves in terms of endemic plant species, although the vegetation patterns found there are not necessarily typical of the entire Lake Wales Ridge. A recent description of the vegetation of

Archbold (Abrahamson *et al.* 1984) distinguishes two kinds of sand pine scrub. The first, with an understory of myrtle oak and scrub hickory (*Carya floridana*), is primarily located on the slopes of a hill, occupying 143 hectares (353 acres). The scrub mint *Dicerandra frutescens* (already federally listed as endangered) is found here. The second, with an understory of rosemary, is located on several patches of dry sand no larger than 1 hectare (2.5 acres) and totals 36 hectares (89 acres), surrounded by scrubby flatwoods (a vegetation of inopina oak with occasional sand pine or slash pine trees), flatwoods, and flatwoods ponds. Rosemary scrub is the home of a number of endemics, including *Eryngium cuneifolium*, *Hypericum cumulicola*, *Paronychia chartacea*, *Polygonella basiramia*, and *Warea carteri* (which also occupies scrubby flatwoods and flatwoods).

*Discussion of the Seven Species Proposed Herein for Listing Follows*

*Chionanthus pygmaeus* (pygmy fringe tree) was first collected by G. V. Nash in 1894 near Eustis, Lake County, Florida. It was later collected and described by John K. Small in 1924 from "ancient sand-dunes between Avon Park and Sebring" in Highlands County (Small 1924). This taxon is recognized as a species, spelled either *Chionanthus pygmaeus* (Hardin 1974), or *Chionanthus pygmaea* (Small 1924, Wunderlin 1982). It may represent a subspecies of *Chionanthus virginicus*, the common fringe tree (Robert Currie, U.S. Fish and Wildlife Service, pers. comm., 1985). It is a shrub of the olive family (Oleaceae). The plant is typically less than 1 meter tall (3 feet), with the stems often rising from branches buried by blowing sand, but may reach 2-4 meters (6-13 feet). The leaves are deciduous, opposite, and entire-margined. The flowers appear in late March and are borne in showy panicles. The corolla lobes (fused petals) are four in number, linear, white, and roughly 1 centimeter long (0.4 inch), as opposed to 2-3 centimeters (0.8-1.2 inch) long in *Chionanthus virginicus*. The fruits are purple drupes 2.0-2.5 centimeters (0.8-1.0 inch) long versus 1.0-1.5 centimeters (0.4-0.6 inch) long in *Chionanthus virginicus* (Ward and Godfrey 1979, Wunderlin 1982, Wunderlin *et al.* 1980a). *Chionanthus pygmaeus* is endemic to sand pine scrub vegetation. It is known from west of Lake Apopka, Lake County; northwestern Osceola County; and the Lake Wales Ridge in Polk and Highlands Counties, including Highlands Hammock State Park according to the Florida Natural Areas Inventory (Florida Department of Natural Resources). A

reported population of *Chionanthus pygmaeus* in Hillsborough County appears to have been *Chionanthus virginicus*, but has been extirpated (Robert Currie, U.S. Fish and Wildlife Service, pers. comm., 1985). *Chionanthus pygmaeus* may be present at Fort Cooper State Park south of Inverness, Citrus County (Florida Natural Areas Inventory), but this record has not been verified.

*Eryngium cuneifolium* (snakeroot) was first collected in 1927 near Sebring, Highlands County, by John K. Small, who subsequently described the plant as a new species (Small 1933). Bell (1963) maintained the plant as a distinct species. *Eryngium cuneifolium* is a member of the parsley family (Apiaceae or Umbelliferae). It is an erect perennial herb with a long, woody taproot and usually several erect, branching stems, 0.2-0.5 meter (0.6-1.5 feet), rarely to 0.9 meter (3 feet), tall. The leaves are clustered at the base of the plant. The basal leaves are long-stalked and shaped like narrow wedges, with 3-5 bristle-tipped teeth at the apex. Stem leaves are smaller and lack leaf stalks. The flowers are small, greenish-white when first opening, turning powder blue. The flowers and bristly bracts form small heads 4-8 millimeters (0.15-0.3 inches) in diameter. The fruit is turban-shaped, scaly, and 1.5-2.0 millimeters (0.06-0.08 inch) long. The plants flower from August to October. *Eryngium cuneifolium* is most similar to *Eryngium aromaticum* (Wunderlin *et al.* 1981b). The known populations of *Eryngium cuneifolium* are in an area about 16 kilometers (10 miles) long, from the west side of Lake Placid southward near Venus. Outlying populations occur in Collier and Putnam Counties (Johnson 1981).

*Hypericum cumulicola* (Highlands scrub hypericum) was described by John K. Small (1924) from specimens collected on the Lake Wales Ridge between Avon Park and Sebring. Small created a new genus for this plant, *Sanidophyllum*. Subsequently, Adams (1962) transferred *Sanidophyllum* to *Hypericum*, a genus with many species in the Southeastern Coastal Plain. It is a member of the St. John's-wort family (Guttiferae or Clusiaceae). *Hypericum cumulicola* is a wiry herbaceous to slightly woody perennial about 0.6 meter (2 feet) tall. Several erect stems, branched near their tops, grow from a taproot. New shoots form in September and overwinter. The stems bear widely-spaced pairs of small, needlelike leaves 0.5 centimeter (0.2 inch) long. The small, numerous flowers are arranged in the upper forks and towards the tips of the stems. Each

flower has five separate, obovate, bright yellow petals. The petals are asymmetrical, like the blades of a window fan. The stamens are numerous. A red to brown capsule produces many minute seeds. Flowering and fruiting occur from June through early November (Judd 1980). *Hypericum cumulicola* shares patches of sunny, relatively barren sand within the scrub with *Cladonia* lichens (reindeer moss) and with other endemic herbs especially *Eryngium cuneifolium*. *Hypericum cumulicola* benefits from fire in its environment (Johnson 1981). The plant is endemic to the sand pine-evergreen oak scrub and rosemary scrub vegetation in the southern portion of the Lake Wales Ridge. The plant occurs in Highlands and Polk Counties, Florida, from Frostproof and The Nature Conservancy's Lake Arbuckle tract south to Venus, where it occurs at the Archbold Biological Station (Judd 1980).

*Paronychia chartacea* (papery whitlow-wort), a member of the pink family (Caryophyllaceae), was first collected by John K. Small, who found it in the scrub between Avon Park and Sebring. Small created a new genus to accommodate the plant, which he named *Nyachia pulvinata* (Small 1925). Subsequent workers transferred this species into the large genus *Paronychia*; the name *Paronychia pulvinata*, however, was preoccupied, and Fernald (1936) renamed the plant *Paronychia chartacea*. Since then, Ward (1977) has recognized *P. chartacea* as one of the seven species of *Paronychia* in Florida. It is an annual plant, 3-10 centimeters (1-4 inches) tall forming bright green low round mats of many branches radiating from a taproot. The stems fork repeatedly from the base. Leaves are opposite, scalelike, rarely longer than 3 millimeters (0.12 inch). The small, white, numerous flowers are solitary or in clusters of 3. They have 5 sepals, each less than 1 millimeter long (0.04 inch), and no petals (Kral 1983, Wunderlin *et al.* 1981a). Flowering is in summer (Wunderlin 1982). *Paronychia chartacea* is one of the less conspicuous scrub plants, but it is rarely easily distinguished from other members of its genus by its mat-forming habit, scalelike leaves, and tiny flowers. It is endemic to the interior scrub in Lake County (where it is known from only one specimen and its current status there is unknown), in at least two sites in Orange County, and in Polk and Highlands Counties, where it is present in substantial numbers at Archbold Biological Station (Wunderlin *et al.* 1981a). The plant occurs at The Nature Conservancy's Arbuckle Lake preserve according to the Florida

Natural Areas Inventory. It is found only on bare sand in scrub vegetation, nearly always with inopina oak and rosemary (Stout 1912). *Paronychia chartacea* benefits from limited disturbance that creates bare sand, and it can form large local populations. However, the plant does not persist in areas that are converted to citrus groves or homes.

*Polygonella basiramia* (wireweed), a member of the buckwheat family (Polygonaceae), was first collected east of Lake Josephine in Highlands County by John K. Small in 1920 and 1921. Small (1924) named the plant *Delopyrum basiramia*. Horton (1963) included *Delopyrum* in the genus *Polygonella* and made *Delopyrum basiramia* a variety of *Polygonella ciliata*, a species from the Tampa Bay area and of the Florida east coast from Brevard County southward. Horton examined only four mature plants of *Polygonella ciliata* var. *basiramia*. Nesom and Bates (1984), working with more specimens, concluded that var. *basiramia* deserved recognition as a full species, and published the name *Polygonella basiramia*. The plant is a taprooted annual with its stems branched at or slightly below ground level, forming a cluster of 7 to more than 30 erect, slender branches of nearly equal height (Nesom and Bates 1984). The stems are up to 0.8 meter (2.5 feet) tall; the hairlike leaves are no more than 2 centimeters (0.8 inch) long. Branches of the main stems are tipped by short clusters of small white flowers. The plant blooms in the fall and fruits in late fall and winter (Wunderlin *et al.* 1980b), and is conspicuous only when in bloom.

*Polygonella basiramia* is endemic to sand pine scrub on the southern Lake Wales Ridge in Polk and Highlands Counties, Florida. Its geographic range extends from the northwest side of Crooked Lake, five miles south of Lake Wales and from the west side of Lake Weohyakapka south to the southern end of the Ridge, east of Archbold Biological Station (Stout 1981, Johnson 1982). *Polygonella basiramia* grows on areas of bare sand within sand pine and rosemary scrub (Johnson 1981, Stout 1982).

*Prunus geniculata* (scrub plum) was named by Roland Harper in 1911 from plants he found in the high sandy hills of Lake County, Florida, just west of Lake Apopka. It is a member of the rose family (Rosaceae). *Prunus geniculata* is a scraggly, heavily branched shrub up to 2 meters (6 feet) tall. The twigs are strongly zigzag, with spiny lateral branches. The deciduous leaves have stipules and fine teeth. The white flowers are five-petaled, about 1.0–1.3

centimeters (0.4–0.6 inch) in diameter. The fruit is a bitter, dull reddish plum, 1.2–2.5 centimeters (0.4–1.0 inch) long (Kral 1983). Flowering is in winter (Wunderlin 1982). Scrub plum is native to two areas in central Florida: (1) Lake County between Lake Apopka and Clermont, where the plum occurred in longleaf pine-turkey oak vegetation; and (2) Polk and Highlands Counties from the vicinity of Lake Wales and Lake Weohyakapka south to highway 27 near Venus (Johnson 1981; Stout 1982), where the plants occurred in sand pine-evergreen oak scrub on the Lake Wales Ridge. It is not known from any protected areas. The plum is often found on roadcuts and fire lanes, which indicates that it benefits from moderate disturbance that removes other shrubs.

*Warea carteri* (Carter's mustard) was named by John K. Small in 1903 from a specimen collected near Miami in 1903. The plant is an unbranched annual 0.2–1.0 meters (0.6–3.0 feet) tall with simple, alternate leaves up to 1 centimeter (0.4 inch) long, gradually diminishing in size upward on the stem, becoming small bracts toward the top of the stem. The stem is topped by a raceme of white, four-petaled flowers. The fruits are seed pods 4–6 centimeters (1.6–2.4 inches) long, mounted on slender stalks up to 1.5 centimeter (0.6 inch) long (Kral 1983). The plant is a member of the mustard family (Cruciferae or Brassicaceae), but *Warea* is of taxonomic interest because it resembles *Cleome* and *Polanisia* of the caper family (Capparidaceae). Over a dozen herbarium collections of *Warea carteri* were made in Dade County from 1878 to 1934, mostly from rock pinelands, but also from scrub. Careful searches have failed to relocate this plant in the remaining fragments of Dade County pineland and it appears to have been extirpated (Nauman 1980). From 1922 to 1967, *Warea carteri* was collected from scrub in Polk and Highlands Counties (Nauman 1980). The plant has also been reported from Liberty County, Florida (a possible misidentification), and from Brevard County (Kral 1983). Currently, despite recent floristic inventories by Johnson (1981), Stout (1982), and by Gary Schultz for the Florida Natural Areas Inventory in 1983, *Warea carteri* is known only from a small area at the Archbold Biological Station, in scrub, Scrubby flatwoods, and flatwoods, where it is associated with *Ceratiola ericoides*, *Calamintha ashei*, *Eryngium cuneifolium*, *Hypericum cumulicola*, and *Paronychia chartacea*.

Federal Government actions on these plants began as a result of Section 12 of the Endangered Species Act of 1973,

which directed the Secretary of the Smithsonian Institution to prepare a report on plants considered to be endangered, threatened, or extinct. This report, designated as House Document No. 94–51, was presented to Congress on January 9, 1975. In the report, *Hypericum cumulicola*, *Paronychia chartacea*, *Polygonella ciliata* var. *basiramia*, *Prunus geniculata*, and *Warea carteri* were listed as endangered; *Chionanthus pygmaeus* and *Eryngium cuneifolium* were listed as threatened. On July 1, 1975 (40 FR 27823), the Service published a notice in the **Federal Register** of its acceptance of the report of the Smithsonian Institution as a petition within the context of section 4(c)(2) [now section 4(b)(3)] of the Act, and of its intention thereby to review the status of the plant taxa named within. The above seven taxa were included in the notice. On June 16, 1976, the Service published a proposed rule in the **Federal Register** (41 FR 24523) to determine approximately 1,700 vascular plant species to be endangered species pursuant to Section 4 of the Act. The list of 1,700 plant taxa was assembled on the basis of comments and data received by the Smithsonian Institution and the Service in response to House Document No. 94–51 and the July 1, 1975, **Federal Register** publication. *Hypericum cumulicola*, *Paronychia chartacea*, *Polygonella ciliata* var. *basiramia*, and *Prunus geniculata* were included in the proposed rule. General comments received in relation to the 1976 proposal were summarized in an April 26, 1978, **Federal Register** publication, which also determined 13 plant species to be endangered or threatened (43 FR 17909). On December 10, 1979, the Service published a notice of withdrawal of that portion of the June 16, 1976, proposal that had expired, along with four other proposals that had expired due to a procedural requirement of the 1978 Amendments. On December 15, 1980, the Service published a revised notice of review of native plants in the **Federal Register** (45 FR 82480); *Chionanthus pygmaeus*, *Eryngium cuneifolium*, *Hypericum cumulicola*, *Paronychia chartacea*, *Polygonella ciliata* var. *basiramia*, *Prunus geniculata*, and *Warea carteri* were included as category-1 species (species for which data in the Service's possession indicate listing is warranted). On November 28, 1983, the Service published in the **Federal Register** (48 FR 53640) a supplement to the 1980 notice of review. This supplement treated *Paronychia chartacea* as a category-2 species (species for which data in the Service's

possession indicate listing is probably appropriate, but for which additional biological information is needed to support a proposed rule). Subsequent field work by Gary Schultz for the Florida Natural Areas Inventory supports the proposal of *Paronychia chartacea* as a threatened species. The proposal to list the six other species as endangered is based on the extensive field work that has been carried out since the Smithsonian Institution report of 1975 by Schultz and others (Johnson 1981, Judd 1980, Nauman 1980, Stout 1982, Wunderlin et al. 1980a, Wunderlin et al. 1980b, and Wunderlin et al. 1981b). All seven species were included in category 1 in the September 27, 1985, revised notice of review of plants (50 FR 39526).

Section 4(b)(3)(B) of the Endangered Species Act, as amended in 1982, requires the Secretary to make findings on certain pending petitions within 12 months of their receipt. Section 2(b)(1) of the 1982 amendments further requires that all petitions pending on October 13, 1982, be treated as having been newly submitted on that date. This was the case for all seven of the interior scrub plants because the 1975 Smithsonian report had been accepted as a petition. On October 13, 1983, October 12, 1984, and October 13, 1985, the Service found that the petitioned listing of these seven species was warranted, and that, although pending proposals had precluded their proposal, expeditious progress was being made to list other species. Publication of the present proposal constitutes the next 1-year finding required on or before October 13, 1986.

#### Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations promulgated to implement the listing provisions of the Act (50 CFR Part 424) set forth the procedures for adding species to the Federal lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to *Chionanthus pygmaeus* Small (pygmy fringe tree); *Eryngium cuneifolium* Small (snakeroot); *Hypericum cumulicola* (Small) P. Adams (= *Sanidophyllum cumulicola* Small) (Highlands scrub hypericum); *Paronychia chartacea* Fernald (= *Nyachia pulvinata* Small) (papery whitlow-wort); *Polygonella basiramia* (Small) Nesom & Bates (= *Delopyrum basiramia* Small, = *Polygonella ciliata* Meisn. var. *basiramia* (Small) Horton) (wireweed);

*Prunus geniculata* Harper (scrub plum); and *Warea carteri* Small (Carter's mustard) are as follows:

A. *The present or threatened destruction, modification, or curtailment of their habitat or range.* All seven of the proposed plants are restricted to sand pine scrub vegetation, except for *Prunus geniculata* and *Chionanthus pygmaeus*, which also occur in longleaf pine-turkey oak vegetation in a limited area west of Lake Apopka in Lake County. Destruction of habitat is the principal threat to the seven species herein proposed for listing.

A large portion of the interior scrub plants' habitat has been converted from sand pine scrub to citrus groves. Lake and Polk Counties are the leading citrus producers in Florida, and Highlands County is an important producer (Fernald 1981). In Lake County, essentially all of the original vegetation that was occupied by pygmy fringe tree and scrub plum has been converted to citrus groves. In Polk and Highlands Counties, many subdivisions laid out from 1952 to 1972 are evident on photorevised topographic maps published by the U.S. Geological Survey. Residential development is concentrated on the Lake Wales Ridge along U.S. Highway 27. The Ridge features well-drained soils, attractive hills, and numerous lakes. In Highlands County, 64.2 percent of the xeric vegetation (scrub, scrubby flatwoods, and southern ridge sandhills) present before settlement was destroyed by 1981. An additional 10.3 percent of the xeric vegetation was moderately disturbed, primarily by building roads to create housing subdivisions (Peroni and Abrahamson 1985). Remaining tracts of scrub in Highlands County are rapidly being developed for citrus groves and housing developments (Fred Lohrer, Archbold Biological Station, pers. comm., 1985). The situation is similar in Polk County. Many of the remaining stands of scrub are vacant lots, patches of land isolated by railroad tracks, or other fragments of the original vegetation that have escaped development. Few large tracts are left. Since not all scrub vegetation, even in Highlands County, contains the endemic plants, the remaining stands of scrub with the endemics are very limited in extent.

*Chionanthus pygmaeus* is known from roughly 20 sites, most apparently consisting of only a few plants (because multiple aboveground shoots grow from buried stems, the number of genetically distinct individuals is unknown). Six sites are on the Lake Wales Ridge in Polk County, nine sites in Highlands

County, and the remaining sites in Lake and Osceola Counties. Only the plants at Highlands Hammock State Park are protected. *Chionanthus pygmaeus* tends to occur with *Prunus geniculata*, but not with the endemic scrub herbs.

*Eryngium cuneifolium* has a very narrow geographic distribution in an area 16 Kilometers (10 miles) long in Highlands County. It occurs at 11 localities in the Placid Lakes subdivision, Archbold Biological Station, and east of Archbold, and at two outlying localities, one at Interlachen in Putnam County, and the other north of Naples in Collier County (Johnson 1981). The small number of localities, combined with this species' requirement for nearly barren sand, renders the plant very vulnerable to further habitat loss. Only the sites at Archbold are protected.

*Hypericum cumulicola* is known historically from 36 sites, 11 of them confirmed in 1983 by the Florida Natural Areas Inventory. This plant occurs at the same sites, and in the same habitat as *Eryngium cuneifolium* in southern Highlands County. All but three sites (Archbold Biological Station and the Lake Arbuckle preserve) are vulnerable to development; many are on vacant lots or small remnant patches of scrub vegetation.

*Polygonella basiramia* shares the same habitat of bare sand as the herbs discussed above. Protected sites exist at Highlands Hammock State Park and Archbold Biological Station, but the total known number of sites is small, only 21.

*Prunus geniculata* is native to two areas in central Florida. One of these areas, in Lake County, has now been converted almost entirely to citrus groves. The other area, in Polk and Highlands Counties, has largely been developed (see "Background" section). Roughly 33 localities have been reported, four of them in Lake County (Johnson 1981, Stout 1982).

*Warea carteri* is presently known from only one population at Archbold Biological Station. Nearly all of its former habitat in Dade County has been destroyed, and the species has not been collected in Highlands or Polk Counties, outside of Archbold, since 1967.

*Paronychia chartacea* has a somewhat larger geographical range than the other species, and is known from 46 sites according to the Florida Natural Areas Inventory. This plant requires scrub habitat with bare sand and the rapid destruction of this habitat threatens this plant.

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

purposes. *Chionanthus pygmaeus* and *Prunus geniculata* are vulnerable to taking due to their horticultural potential as attractive ornamentals; *Chionanthus pygmaeus* is already in cultivation (F. Lohrer, Archbold Biological Station, pers. comm., 1985). The closely related *Chionanthus virginicus* and *Prunus angustifolia* (chickasaw plum) are used as ornamentals. Collecting or vandalism could threaten the other five as well if publicity increases.

C. *Disease or predation.* Not applicable.

D. *The inadequacy of existing regulatory mechanisms.* *Chionanthus pygmaeus*, *Hypericum cumulicola*, and *Warea carteri* are listed as endangered under the Preservation of the Native Flora of Florida Law, section 581.185 of the Florida Statutes. The other species in this proposal are not protected by the State law at the present time. The Florida law regulates taking, transport, and the sale of plants, but it does not provide habitat protection. *Chionanthus pygmaeus*, *Hypericum cumulicola*, and *Prunus geniculata* were listed as endangered by the Florida Committee on Rare and Endangered Plants and Animals (Ward 1979a), but this listing confers no protection under the law.

Several of these species are protected where they grow in the privately-owned Archbold Biological Station, in Highlands Hammock State Park, or in the Tiger Creek and Arbuckle Lake preserves owned by The Nature Conservancy. These existing preserves, however, do not contain all of the endemic scrub plants, and may not have sufficient populations of the species herein proposed for listing to ensure their conservation. Listing of these species under the Endangered Species Act would add Federal protection to these species.

E. *Other natural or manmade factors affecting their continued existence.* The five herbs (*Eryngium cuneifolium*, *Hypericum cumulicola*, *Paronychia chartacea*, *Polygonella basiramia*, and *Warea carteri*) are all vulnerable to destruction by off-road vehicles that pass through the open spaces between shrubs. Trampling of the herbs by pedestrians is potentially a problem in areas set aside for scientific or educational use (Judd 1980). Restriction to specialized habitats and small geographic ranges tends to intensify any adverse effects upon the populations of any rare plant. This is certainly true for these seven species of the Florida interior scrub. The herbs also depend on occasional fires (see "Background" section) or equivalent mechanical land disturbance to maintain their bare sand habitats. Conservation of the scrub

ecosystem and its endemic plants requires adequately large areas of natural vegetation and long-term vegetation management, including prescribed fire or brush removal. Archbold Biological Station conducts prescribed burning; similar vegetation management is expected for the Tiger Creek and Arbuckle Lake preserves. The listing of these scrub plants may encourage the development and implementation of prescribed burning plans or other vegetation management.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these species in determining to propose this rule. Based on this action, the preferred alternative is to list *Chionanthus pygmaeus*, *Eryngium cuneifolium*, *Hypericum cumulicola*, *Polygonella basiramia*, *Prunus geniculata*, and *Warea carteri* as endangered species, and to list *Paronychia chartacea* as a threatened species.

*Chionanthus pygmaeus* and *Prunus geniculata* have been extirpated from most of their historic ranges and presently exist in small numbers at few sites; they could become extinct in the near future as removal of scrub vegetation continues. *Warea carteri* has been extirpated from nearly all of its former range; the plant is now restricted to a single locality, where the low number of individuals renders it vulnerable to extinction. *Eryngium cuneifolium*, *Hypericum cumulicola*, and *Polygonella basiramia* have already lost most of their original habitat, and further habitat destruction is continuing rapidly. All of the above herbs are also endangered by vegetation change within their shared habitat. The patches of relatively bare sand occupied by these plants eventually disappear as evergreen scrub oaks encroach (see "Background" section). These six plants are in danger of extinction throughout all or significant portions of their ranges, and therefore fit the Act's definition of endangered.

*Paronychia chartacea* has been extirpated from most of its former range and is threatened by lack of fire or other disturbances that are needed to renew the bare sand it occupies in remaining areas of scrub vegetation. However, this plant has a wider geographic range and is present at more sites than the six plants proposed for endangered status. It is therefore likely to become an endangered species within the foreseeable future rather than being in danger of extinction. Because of this, it fits the definition of a threatened species contained in the Act.

Based on current knowledge, all other alternatives to the proposed listing of these species as endangered or threatened do not adequately reflect the biological facts and therefore have been rejected. Critical habitat is not being proposed for the reasons described in the next section.

#### Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that, to the maximum extent prudent and determinable, the Secretary designate any habitat of a species which is considered to be critical habitat at the time a species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not prudent for these seven species at this time. Publication of critical habitat maps in the *Federal Register* would increase the degree of threat from taking or other human activity. The known sites for these species are primarily on private land with no known Federally funded or Federally authorized activities. The major exception is State-owned highway rights-of-way. All the species herein proposed for listing, except *Warea carteri*, exist along U.S. Highway 27 and/or other roads. These occurrences are always at the edges of tracts of scrub vegetation in private ownership. The proper agencies have been notified of the plants' locations and management needs. *Chionanthus pygmaeus* and *Polygonella basiramia* occur at Highlands Hammock State Park and *Chionanthus pygmaeus* may occur at Fort Cooper State Park. The State of Florida is aware of their locations. No Federal involvement is known at these parks. Designation of critical habitat would provide no further notification benefit. *Chionanthus pygmaeus* and *Prunus geniculata* are desirable as ornamentals, and all seven species are vulnerable to vandalism and unintentional trampling. While collecting is prohibited in the State parks and on Federal lands, these prohibitions are difficult to enforce. The Service believes that Federal involvement in the areas where these plants occur can be identified without the designation of critical habitat. Therefore, the Service finds that designation of critical habitat for these plants is not prudent at this time, since such designation could be expected to increase the degree of threat from collecting or other human activity.

#### Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition,

recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. Such actions are initiated by the Service following listing. The protection required of Federal agencies and the prohibitions against collecting are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their action with respect to any species that is proposed or listed as endangered or threatened and with respect to any critical habitat. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402, and are now under revision (see proposal at 48 FR 29990; June 29, 1983). Section 7(a)(4) requires Federal agencies to confer informally with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. All presently known sites for the Florida interior scrub endemic plants are on private or State-owned land with no known Federal involvement, with the following exceptions. Populations extending onto State-owned highway rights-of-way may be subject to Federal involvement if the U.S. Department of Transportation (Federal Highway Administration) should provide funds for maintenance or construction. Activities involving Federal mortgage programs, including those of U.S. Department of Agriculture (Farmers Home Administration), Veterans Administration, and the U.S. Department of Housing and Urban Development (FHA loans), may be subject to section 7 review. The supply of electricity to new housing developments may be subject to Federal involvement through the Rural Electrification Administration.

The Act and its implementing regulations found at 50 CFR 17.61, 17.62, and 17.63 for endangered species and 17.71 and 17.72 for threatened species set forth a series of general trade prohibitions and exceptions that apply to all endangered and threatened plant species. With respect to the seven Florida scrub plants, all trade prohibitions of section 9(a)(2) of the Act, implemented by 50 CFR 17.61 or 17.71, would apply. These prohibitions, in part, would make it illegal for any person subject to the jurisdiction of the United States to import or export, transport in interstate or foreign commerce in the course of a commercial activity, or sell or offer for sale these species in interstate or foreign commerce. Seeds for cultivated specimens of threatened plant species are exempt from these prohibitions provided that a statement of "cultivated origin" appears on their containers. The Act and 50 CFR 17.62, 17.63, or 17.72 also provide for the issuance of permits to carry out otherwise prohibited activities involving endangered and threatened species under certain circumstances. It is anticipated that few trade permits would be sought or issued for the seven plants, with the exception of *Chionanthus pygmaeus*, which is already in cultivation (F. Lohrer, Archbold Biological Station, pers. comm., 1985), and may be used as an ornamental.

Section 9(a)(2)(B) of the Act, as amended in 1982, and implementing regulations, prohibit the removal and reduction to possession of listed plant species from areas under Federal jurisdiction. This prohibition would apply to *Chionanthus pygmaeus*, *Eryngium cuneifolium*, *Hypericum cumulicola*, *Polygonella basiramia*, *Prunus geniculata*, *Paronychia chartacea*, and *Warea carteri*. Permits for exceptions to these prohibitions are available through regulations published September 30, 1985 (50 FR 39681; to be codified at 50 CFR 17.62). Requests for copies of the regulations on plants and inquiries regarding them may be addressed to the Federal Wildlife Permit Office, U.S. Fish and Wildlife Service, Washington, DC 20240 (703/235-1903 or FTS 235-1903).

#### Public Comments Solicited

The Service intends that any final rule adopted will be accurate and as effective as possible in the conservation of endangered or threatened species. Therefore, any comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other

interested party concerning any aspect of these proposed rules are hereby solicited. Comments particularly are sought concerning:

(1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to *Chionanthus pygmaeus*, *Eryngium cuneifolium*, *Hypericum cumulicola*, *Paronychia chartacea*, *Polygonella basiramia*, *Prunus geniculata*, or *Warea carteri*;

(2) The location of any additional populations of these species and the reasons why any habitat should or should not be determined to be critical habitat as provided by Section 4 of the Act;

(3) Additional information concerning the range and distribution of these species; and

(4) Current or planned activities in the ranges and habitats of these species and their possible impacts on these species.

Final promulgation of the regulations on these species will take into consideration the comments and any additional information received by the Service, and such communications may lead to adoption of final regulations that differ from this proposal.

The Endangered Species Act provides for a public hearing on this proposal, if requested. Requests must be filed within 45 days of the date of the proposal. Such requests must be made in writing and addressed to the Field Supervisor, Endangered Species Field Station, 2747 Art Museum Drive, Jacksonville, Florida 32207.

#### National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the Federal Register on October 25, 1983 (48 FR 49244).

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#### Author

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#### List of Subjects in 50 CFR Part 17

Endangered and threatened wildlife, Fish, Marine mammals, Plants (agriculture).

#### Proposed Regulations Promulgation

#### PART 17—[AMENDED]

Accordingly, it is hereby proposed to amend Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, as set forth below:

1. The authority citation for Part 17 continues to read as follows:

Authority: Pub. L. 93-205, 87 Stat. 884; Pub. L. 94-359, 90 Stat. 911; Pub. L. 95-632, 92 Stat. 3751; Pub. L. 96-159, 93 Stat. 1225; Pub. L. 97-304, 96 Stat. 1411 (16 U.S.C. 1531 *et seq.*).

2. It is proposed to amend § 17.12(h) by adding the following, in alphabetical order under the families indicated, to the List of Endangered and Threatened Plants:

#### § 17.12 Endangered and threatened plants.

\* \* \* \* \*

(h) \* \* \*

| Species  |                           | Historic range | Status | When listed | Critical habitat | Special rules |
|--|---------------------------|----------------|--------|-------------|------------------|---------------|
| Scientific name  | Common name               |                |        |             |                  |               |
| Apiaceae—Parsley family:   |                           |                |        |             |                  |               |
| <i>Eryngium cuneifolium</i>  | Snakeroot                 | U.S.A. (FL)    | E      |             | NA               | NA            |
| Brassicaceae—Mustard family:   |                           |                |        |             |                  |               |
| <i>Warea carteri</i>   | Carter's mustard          | U.S.A. (FL)    | E      |             | NA               | NA            |
| Caryophyllaceae—Pink family:   |                           |                |        |             |                  |               |
| <i>Paronychia chartacea</i> (- <i>Nyachia pulvinata</i> )                        | Papery whitlow-wort       | U.S.A. (FL)    | T      |             | NA               | NA            |
| Hypericaceae—St. Johns-Wort family:  |                           |                |        |             |                  |               |
| <i>Hypericum cumukicola</i>  | Highlands scrub hypericum | U.S.A. (FL)    | E      |             | NA               | NA            |
| Oleaceae—Olive family:   |                           |                |        |             |                  |               |
| <i>Chionanthus pygmaeus</i>  | Pygmy fringe tree         | U.S.A. (FL)    | E      |             | NA               | NA            |
| Polygonaceae—Buckwheat family:   |                           |                |        |             |                  |               |
| <i>Polygonella basirama</i> (- <i>Polygonella ciliata</i> var. <i>basirama</i> ) | Wireweed                  | U.S.A. (FL)    | E      |             | NA               | NA            |
| Rosaceae—Rose family:  |                           |                |        |             |                  |               |
| <i>Prunus geniculata</i>   | Scrub plum                | U.S.A. (FL)    | E      |             | NA               | NA            |

Dated: March 2, 1986.

**P. Daniel Smith,**

*Deputy Assistant Secretary for Fish and  
Wildlife and Parks.*

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