

**SUMMARY:** The Service determines *Thalictrum cooleyi* (Cooley's meadowrue), a perennial herb limited to 12 populations in North Carolina and Florida, to be an endangered species under the authority of the Endangered Species Act of 1973, as amended (Act). *Thalictrum cooleyi* is endangered by suppression of fire, mining, drainage activities associated with silviculture and agriculture, and residential and industrial development. This action will implement Federal protection provided by the Act for *Thalictrum cooleyi*.

**EFFECTIVE DATE:** March 9, 1989.

**ADDRESSES:** The complete file for this rule is available for inspection, by appointment, during normal business hours at the Asheville Field Office, U.S. Fish and Wildlife Service, 100 Otis Street, Room 224, Asheville, North Carolina 28801.

**FOR FURTHER INFORMATION CONTACT:** Ms. Nora Murdock at the above address (704/259-0321 or FTS 672-0321).

**SUPPLEMENTARY INFORMATION:**

#### Background

*Thalictrum cooleyi*, described by H.E. Ahles (1939) from material collected in Onslow County, North Carolina, is a rhizomatous perennial herb. The stems, which generally do not exceed 1 meter in height (but sometimes reach 2 meters on recently burned sites), are erect in full sun; in shade they are lax and sometimes lean on other plants or trail along the ground. Leaflet shape (as well as texture) varies considerably but is usually narrowly lanceolate and unlobed, although occasionally two- to three-lobed leaves are seen. The unisexual flowers are borne in an open panicle on slender pedicels in mid- to late June. The flowers lack petals, but staminate ones have yellowish to white sepals and lavender filaments about 5 to 7 millimeters long. Pistillate flowers are smaller and have greenish sepals. (Flower color can vary somewhat between plants, and at different stages of maturity in the same plant.) The fruits, which mature in August and September, are narrowly ellipsoidal achenes approximately 5 to 6 millimeters long (Radford *et al.*, 1964, Kral 1983, Rome 1987, Leonard 1987).

According to Ahles (1939), who described the species, *Thalictrum cooleyi* differs from other similar species in the *Leucocoma* section of this genus in having lavender rather than white filaments (although this character is not always consistent even within the same population), in having much narrower leaflets that are narrowly lanceolate instead of oblong to ovate, and in having fewer leaf divisions.

*Thalictrum cooleyi* is a species endemic to the Southeastern Coastal Plain where it is currently known from 11 locations in North Carolina and 1 in Florida. The species occurs in moist to wet bogs and savannas and savanna-like openings on circumneutral soils and is dependent upon some form of disturbance to maintain the open quality of its habitat. Currently, artificial disturbances, such as power line and road right-of-way maintenance, and plowed firebreaks, are maintaining some of the openings historically provided by naturally occurring periodic fires.

Seventeen populations of *Thalictrum cooleyi* have been reported historically from eight counties in North Carolina, Georgia, and Florida. The report of the Georgia population is now believed to have been based on a misidentification (Leonard 1987). The 12 remaining populations (located in Walton County, Florida; and Brunswick, Columbus, Onslow, and Pender Counties, North Carolina) are all in private ownership, with The Nature Conservancy owning part of one of the sites in Pender County, North Carolina. Extirpated populations are believed to have succumbed as a result of fire suppression and silvicultural and agricultural activities. The continued existence of *Thalictrum cooleyi* is threatened by these activities as well as mining (part of one population exists on the edge of an inactive marl pit mine), drainage, highway construction/improvement, and herbicide use.

Federal government actions on this species began with section 12 of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*), which directed the Secretary of the Smithsonian Institution to prepare a report on those plants considered to be endangered.

## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### 50 CFR Part 17

#### Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for *Thalictrum Cooleyi* (Cooley's Meadowrue)

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

**ACTION:** Final rule.

threatened, or extinct. This report, designated as House Document No. 94-51, was presented to Congress on January 9, 1975. The Service published a notice in the July 1, 1975, **Federal Register** (40 FR 27832) 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.

On December 15, 1980, the Service published a revised notice of review for native plants in the **Federal Register** (45 FR 82480); *Thalictrum cooleyi* was included in that notice as a category 1 species. Category 1 species are those species for which the Service currently has on file substantial information on biological vulnerability and threats to support proposing to list them as endangered or threatened species. Subsequent revisions of the 1980 notice have maintained *Thalictrum cooleyi* in category 1.

Section 4(b)(3)(B) of the Act, as amended in 1982, requires the Secretary to make certain findings on 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 *Thalictrum cooleyi* because of the acceptance of the 1975 Smithsonian report as a petition. On October 13, 1983; October 12, 1984; October 11, 1985; October 10, 1986; and October 14, 1987; the Service found that the petitioned listing of *Thalictrum cooleyi* was warranted but precluded by other listing actions of a higher priority and that additional data on vulnerability and threats was still being gathered. The April 21, 1988 (53 FR 13220), proposal to classify *Thalictrum cooleyi* as endangered constituted the final finding required for this species.

#### Summary of Comments and Recommendations

In the April 21, 1988, proposed rule and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. Appropriate State agencies, county governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. Newspaper notices inviting public comment were published in North Carolina's "Wilmington Star-News" and in the Fort Walton Beach, Florida, "Playground Daily News" on May 10, 1988, and May 11, 1988, respectively.

Two written comments were received. One stated no position on the proposal but offered additional information on morphological and chromosomal characters of the species. Carolina Power and Light Company (landowner of one of the population sites) offered the other comment, which was in support of the proposal. One individual verbally provided additional distributional and threat information which has been incorporated into the appropriate sections of the rule.

#### Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that *Thalictrum cooleyi* should be classified as an endangered species. Procedures found at section 4(a)(1) of the Act and regulations (50 CFR Part 424) promulgated to implement the listing provisions of the Act were followed. A species may be determined to be endangered or threatened due to one or more of the five factors described in section 4(a)(1). These factors and their application to *Thalictrum cooleyi* Ahles (Cooley's meadowrue) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* *Thalictrum cooleyi* has been and continues to be endangered by destruction or adverse alteration of its habitat. Since discovery of the species, approximately one-fourth of the known populations have been extirpated largely due to fire suppression and conversion of the habitat for silvicultural and agricultural purposes. Fire suppression is a serious problem for this species and will be discussed in detail under factor "E" below.

At least 11 of the remaining 12 populations are currently threatened by habitat alteration (Rayner 1980, Leonard 1987). Four of these populations survive on roadsides, and another three are in power line rights-of-way. All of these populations are small, which increases their vulnerability to extirpation as a result of highway and right-of-way maintenance and improvement, particularly if herbicides are used. The 11 populations remaining in North Carolina probably represent the fragmented remains of what were once 3 larger populations—the 6 sites in Onslow and Pender Counties are all within a 6.5-kilometer radius, the 3 sites in Columbus County are within a 4.0-kilometer radius, and the 2 sites in Brunswick County are within a 1.5-kilometer radius. These 11 sites now support a total of approximately 800

plants (which may be an overestimate due to the rhizomatous nature of the species) (Leonard 1987). Areas within the small radii occupied by the remaining colonies in North Carolina have been bulldozed, planted in fields, converted to pastures, or drained, undoubtedly destroying *Thalictrum cooleyi* populations in the process (Rayner 1980, Leonard 1987). One of the Pender County, North Carolina, populations was recently impacted by private road maintenance operations which resulted in most of the plants being covered with fill material. The Walton County, Florida, site has been recently impacted by commercial timber operations, and only nine mature plants remain there (Deborah White, Florida Natural Areas Inventory, personal communication, 1987). As stated by Mansberg (1985) the "extreme narrowness of geographic range and scarcity of appropriate habitat further increases the severity of the threats" faced by the species.

Although, as stated in the "Background" section above, this species requires some form of disturbance to maintain its open habitat and can withstand mowing and timber-harvesting operations if properly done, it cannot withstand bulldozing, drainage, conversion to pine plantation, or direct application of herbicides. In addition, the small populations that survive on road edges could be easily destroyed by highway improvement projects or right-of-way maintenance activities if these are not done in a manner consistent with protecting *Thalictrum cooleyi*.

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* *Thalictrum cooleyi* is not currently a significant component of the commercial trade in native plants. Research is ongoing with the alkaloids in other species of *Thalictrum* which are believed to have potential medical (chemotherapy) applications; because of the large amounts of material necessary for such studies, it is unlikely that a species as rare as *Thalictrum cooleyi* could ever be analyzed for this purpose using currently available methodology. However, because of its small and easily accessible populations, Cooley's meadowrue is vulnerable to taking and vandalism that could result from increased specific publicity. Rayner (1980) stated that although it is unlikely that it will ever be of commercial or horticultural interest, delineation of critical habitat for *Thalictrum cooleyi* would probably increase collections made for scientific or educational purposes.

C. *Disease or predation.* Not applicable to this species at this time.

D. *The inadequacy of existing regulatory mechanisms.* *Thalictrum cooleyi* is afforded legal protection in North Carolina by North Carolina General Statutes, sections 106-202.12 to 106-202.19 (Cum. Supp. 1985), which provides for protection from intrastate trade (without a permit), for monitoring and management of State-listed species, and prohibits taking of plants without written permission of landowners. *Thalictrum cooleyi* is listed in North Carolina as endangered. This species is not listed by the State of Florida, where it was thought to have been extirpated until very recently. State prohibitions against taking are difficult to enforce and do not cover adverse alterations of habitats, such as disruption of drainage patterns and water tables or exclusion of fire. Section 404 of the Federal Water Pollution Control Act (FWPCA) could potentially provide some protection for the habitat of *Thalictrum cooleyi*; however, most, if not all, of the sites where it occurs do not meet the wetlands criteria of the FWPCA. The Endangered Species Act would provide additional protection and encouragement of active management for *Thalictrum cooleyi*.

E. *Other natural or manmade factors affecting its continued existence.* As mentioned in the "Background" section of this rule, many of the remaining populations are small in numbers of individual stems and in terms of area covered by the plants. In addition, the rhizomatous nature of the species indicates that there are many fewer individual plants in existence than stem counts would indicate. There is therefore low genetic variability within populations, making it more important to maintain as much habitat and as many of the remaining colonies as possible. In addition, the dioecious nature of the species further increases the vulnerability of extremely small populations, where plants of only one sex may remain. Leonard (1987) observed a ratio of male to female plants (in all populations) of three to one, a situation which probably hinders reproduction in recently colonized sites and in sites with very few plants.

Leonard (1987) also noted that the species is not prolific in terms of the number of seeds produced and that it seems to lack an effective seed distribution mechanism, which further inhibits colonization of new sites. Much remains unknown about the demographics and reproductive requirements of this species. Fire or some other suitable form of disturbance,

such as mowing or careful clearing, is essential to maintaining the savanna and bog edges where *Thalictrum cooleyi* occurs. Without such periodic disturbance, this type of habitat is gradually overtaken and eliminated by the shrubs and trees of the adjacent woodlands. As the woody species increase in height and density, they overtop the *Thalictrum cooleyi*, which is shade-intolerant. The current distribution of this species is ample evidence of its dependence on disturbance. Of the 12 remaining populations, 7 are on roadsides or in power line rights-of-way, and the other 5 are in areas which have been exposed to periodic fire. Populations in areas that have been recently burned tend to be more vigorous and to bloom more profusely.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to make this rule final. Based on this evaluation, the preferred action is to list *Thalictrum cooleyi* as endangered. With one-fourth of the species' populations already having been eliminated, and only 12 remaining in existence; and, based upon its dependence on some form of active management, it definitely warrants protection under the Act. Endangered status seems appropriate because of the imminent serious threats facing most populations. As stated by Rayner (1980), "*Thalictrum cooleyi* certainly is one of the rarest, most directly threatened species in the entire United States. It should receive top priority for listing as an endangered species." Critical habitat is not being designated for the reasons discussed below.

#### 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 the species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not prudent for *Thalictrum cooleyi* at this time. As discussed under factor "B" in the "Summary of Factors Affecting the Species," *Thalictrum cooleyi* is threatened by taking, an activity difficult to enforce against. Publication of critical habitat descriptions would make this species even more vulnerable and increase State enforcement problems. All involved parties and landowners will be notified of the location and importance of protecting and managing this species' habitat.

#### Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the 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 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 taking are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402. 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 adversely affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

Federal activities that could impact *Thalictrum cooleyi* and its habitat in the future include, but are not limited to, the following: Power line construction, maintenance, and improvement; highway construction, maintenance, and improvement; drainage alterations; and permits for mineral exploration and mining. The Service will work with the involved agencies to secure protection and proper management of *Thalictrum cooleyi* while accommodating agency activities to the extent possible.

The Act and its implementing regulations found at 50 CFR 17.61, 17.62, and 17.63 set forth a series of general trade prohibitions and exceptions that apply to all endangered plants. With respect to *Thalictrum cooleyi*, all trade prohibitions of section 9(a)(2) of the Act, implemented by 50 CFR 17.61, would apply. These prohibitions, in part, 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 commercial activity, sell or offer for sale

this species in interstate or foreign commerce, or to remove and reduce the species to possession from areas under Federal jurisdiction. In addition, for listed plants the 1988 amendments (Pub. L. 100-478) to the Act prohibit their malicious damage or destruction on Federal lands, and their removal, cutting, digging up, or damaging or destroying in known violation of any State law or regulation, including State criminal trespass law. Certain exceptions can apply to agents of the Service and State conservation agencies. The Act and 50 CFR 17.62 and 17.63 also provide for the issuance of permits to carry out otherwise prohibited activities involving endangered species under certain circumstances. It is anticipated that few trade permits would ever be sought or issued, since *Thalictrum cooleyi* is not common in cultivation or in the wild. Requests for copies of the regulations on plants and inquiries regarding them may be addressed to the Office of Management Authority, U.S. Fish and Wildlife Service, P.O. Box 27329, Central Station, Washington, DC 20038-7329 (202-343-4955).

**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).

**References Cited**

Ahles, H. 1939. *Thalictrum cooleyi* sp. nov. Brittonia 11:68-70.  
 Kral, R. 1983. A report on some rare, threatened, or endangered forest-related vascular plants of the south. Tech. publ. R8-TP-2. USDA Forest Service. 4:28-431.  
 Leonard, S. 1987. Inventory of populations of *Thalictrum cooleyi* and its occurrence sites in North Carolina. Report to the North Carolina Natural Heritage Program, Raleigh, NC. 16 pp.  
 Mansberg, L. 1985. *Thalictrum coleyi*: draft global element ranking form prepared for the Nature Conservancy; North Carolina Natural Heritage Program, Raleigh, NC. 2 pp.  
 Radford, A., H. Ahles, and C. Bell. 1964. Manual of the vascular flora of the Carolinas. UNC Press, Chapel Hill, 459-462.  
 Rayner, D. 1980. Status report on *Thalictrum cooleyi* Ahles, submitted to U.S. Fish and Wildlife Service, Atlanta, GA.  
 Rome, A. 1987. *Thalictrum cooleyi*: draft stewardship abstract. The Nature Conservancy, Arlington, VA. 9 pp.

**Author**

The primary author of this rule is Ms. Nora Murdock, Asheville Field Office,

U.S. Fish and Wildlife Service, 100 Otis Street, Room 224, Asheville, North Carolina 28801, (704/259-0321 or FTS 672-0321).

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

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

**Regulation Promulgation**

Accordingly, Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, is amended as set forth below:

**PART 17—(AMENDED)**

1. The authority citation for Part 17 is revised 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; Pub. L. 100-478, 102 Stat. 2306; Pub. L. 100-653, 102 Stat. 3825 (16 U.S.C. 1531 *et seq.*); Pub. L. 99-625, 100 Stat. 3500, unless otherwise noted.

2. Amend § 17.12(h) for plants by adding the following, in alphabetical order under the family Ranunculaceae, to the List of Endangered and Threatened Plants:

**§ 17.12 Endangered and threatened plants.**

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 (h) \* \* \*

Species		Historic range	Status	When listed	Critical habitat	Special rules
Scientific name	Common name					
Ranunculaceae—Buttercup family:						
<i>Thalictrum cooleyi</i> .....	Cooley's meadowrue .....	U.S.A. (NC, FL).....	E	344	NA	NA

Dated: January 24, 1989.  
 Becky Norton Dunlop,  
 Assistant Secretary for Fish and Wildlife and Parks.  
 [FR Doc. 89-2858 Filed 2-6-89; 8:45 am]  
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