DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Proposed Endangered or Threatened Status for Three Granite Outcrop Plants

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The Service proposes to determine two plants, *Isoetes melanospora* (black-spored quillwort) and *Isoetes tegetiformans* (mat-forming quillwort), to be endangered species under the authority contained in the Endangered Species Act (Act) of 1973, as amended. The Service proposes threatened status for one plant, *Amphianthus pusillus* (little amphianthus). These three species are restricted to granite outcrops in the Piedmont physiographic region in the Southeast and all have their center of distribution in Georgia. *Isoetes melanospora* is presently known from five sites in Georgia; *Isoetes tegetiformans* is extant at ten sites in Georgia; and *Amphianthus pusillus* occurs at 39 sites in Georgia, three sites in Alabama, and three sites in South Carolina. However, only one population of *Isoetes melanospora*, two populations of *Isoetes tegetiformans*, and six populations of *Amphianthus pusillus* are large and vigorous. These species are jeopardized by the continuing destruction of granite outcrops from quarry operations, and habitat modification from dumping, their inclusion in pasture, and heavy recreational use [especially off-road vehicle (ORV) use]. All three species have lost populations through such activities. This proposed rule, if made final, will extend the Act's protection to these three granite outcrop endemics. The Service seeks data and comments from the public on this proposed rule.

DATES: Comments from all interested parties must be received by April 20, 1987. Public hearing requests must be received by April 6, 1987.

ADDRESSES: Comments and materials concerning this proposal should be sent to the Endangered Species Field Station, U.S. Fish and Wildlife Service, Jackson Mall Office Center, Suite 316, 300 Woodrow Wilson Avenue, Jackson, Mississippi 39213. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Mr. Dennis B. Jordan at the above address (601/965–4900 or FTS 490–4900).

SUPPLEMENTARY INFORMATION:

Background

Amphianthus pusillus, *Isoetes melanospora*, and *Isoetes tegetiformans* are endemic to granite outcrops in the Piedmont physiographic region of the Southeastern U.S. *Amphianthus* is known from Alabama, Georgia, and South Carolina. *Isoetes melanospora* and *Isoetes tegetiformans* occur only in Georgia. These three taxa are the most restricted of the granite outcrop species (Bridges 1986a). Granite outcrops superficially resemble one another but may differ geologically as igneous, quartzitic, gneissic or porphyritic granite (Lester 1938, McVaugh 1943, Wharton 1978). Outcrop supporting populations of all three taxa occur as large isolated domes or as gently rolling "flatrocks." These communities are believed to have long served as active sites for speciation, as evidenced by a high degree of endemism. Speciation is accelerated on outcrops due to the scattered distribution of rock exposures and the harsh environmental conditions (high light intensities, extreme wet/dry periods) to which the species have become adapted (Murdy 1968).

Amphianthus pusillus, *Isoetes melanospora*, and *Isoetes tegetiformans* typically occur in shallow flat-bottomed pools found on the crest and flattened slopes of unquarried outcrops (Lester 1938, Garris 1980, Rury 1985, Rayner 1986). Such pools have been referred to as vernal pools (Kral 1983, Rayner 1986), weathering pits (Bake 1970), depression pits (Murdy 1968) and solution pits (Lester 1938, McVaugh 1943) and are rare in even the best localities. These pools range in size from 0.3 square meter to 10 square meters; the vast majority of these pools range from 0.5–1 meter square. These pools retain water for several weeks following heavy rains and completely dry out with summer droughts. They are usually several meters in diameter and are circular or irregularly-shaped due to the coalescene of adjacent pools (Lunsford 1938, McVaugh 1943). For species occur directly with these taxa due to the aquatic nature of the microhabitat (McVaugh 1943). *Amphianthus* is the most common associate of *Isoetes melanospora* and *Isoetes tegetiformans*. Other plants which may occur in and around the pools include lichens (*Cladonia* sp.), *Diamorpha smallii*, *Arenaria uniflora*, *Arenaria glabra*, *Polytrichum commune*, *Isoetes piedmontana*, *Juncus georgianus*, *Agrostis* sp., *Lindernia monticola*, *Cyperus granitophilus*, *Andropogon scoparius*, and *Selaginella tortipila* (Garris 1980, Kral 1983, Rayner 1986). Two Federal candidate plant species (*Sedum pusillum* and *Draba aprica*) occur with *Amphianthus* and *Isoetes tegetiformans* at several sites in eastern Georgia.

A discussion of the three species proposed for listing herein follows:

Amphianthus pusillus is a diminutive fibrous-rooted annual. It has both floating and submerged leaves. The submerged leaves are lanceolate, less than 1 centimeter (cm) (0.4 inch) in length and appear to be arranged in a basal rosette. The floating leaves are ovate, 4–8 millimeters (mm) (0.16–0.32 inch) long, 3–5 mm (0.12–0.20 inch) wide, oppositely arranged and are attached to the stem near the submerged leaves by long, delicate stems. Its flowers are white, 4–5 mm (0.16–0.20 inch) in length and are borne in the axils of both types of leaves. Floating flowers are chasmogamous (open) and submerged flowers are cleistogamous (closed) except when exposed to air (lungsford 1938, Rayner 1986). *Amphianthus* usually flowers in March or April (depending upon environmental conditions) and produces a capsule, 2–3 mm (0.08–0.12 inch) broad and 1 mm (0.04 inch) long. *Amphianthus* is ephemeral, usually completing its life cycle in a 3-to-4 week period (Garris 1980; Kral 1983; Rayner 1986).

This species was first collected by M.C. Leavenworth in 1836 in Newton County, Georgia (present-day Rockdale County) and later described by John Torrey in 1839 (Pennell 1935). *Amphianthus pusillus* is thought to e a relict species, a monotypic genus of doubtful placement in the family Scrophulariaceae (Pennell 1935, McVaugh 1943, Murdy 1968). It is most similar in flower morphology to *Gratiola* and *Bacopa* but differs from all other southeastern Scrophulariacease by its dimophic leaves and flowers (Pennell 1935, Kral 1983).

Optimal habitat for *Amphianthus* has been consistently described as pools surrounded by a rock rim several centimeters in height and sandy-silty soils 2–5 cm (0.8–2.0 inches) in depth with a low organic matter content (Lunsford 1938, McVaugh 1943, Garris 1980, Miller 1985, Rayner 1986). Most populations occur in such typical pools; however, Garris (1980) and Rayner (1986) have reported several populations from atypical habitats. Most of these atypical pools lacked on intact rim, others were in ecotonal zones or seepage areas.

Amphianthus primarily occurs in Georgia with peripheral populations in Alabama and South Carolina. Status surveys have been conducted throughout its range by Miller (1985) in Alabama, Garris (1980) in Georgia, and Rayner (1981, 1986) in South Carolina. Extensive surveys of granite outcrops in the Piedmont have been conducted by J. Allison since the 1970's (University of Georgia, pers. comm. 1986).

The actual number of individual plants is difficult to determine since *Amphianthus* is an ephermeral annual whose population size and vigor is dependent upon weather conditions (sufficient moisture). This is further complicated by a seed bank of undertermined size and dormancy period (Rayner 1986).

Amphianthus was first reported from Alabama by Harper (1939) in Randolph County. However, this population has not been relocated in years and is believed extirpated. Currently, there are three extent populations in two counties of the State (Randolph and Chambers). All three areas contain limited populations of *Amphianthus*. Two of the sites have fewer than 50 plants confined to a single vernal pool, while the third population consists of several hundred plants in two to three pools (Miller 1985, Allison pers. comm. 1986).

Amphianthus is historically known from 50 sites in Georgia (McVaugh and Pyron 1937, Lunsford 1938, McVaugh 1943, Burbanck and Platt 1964); however 11 of these populations have been destroyed (Garris 1980; Allison pers. comm. 1986; Jones, University of Georgia pers. comm., 1986). Currently, 39 populations are thought extant; with 74% of these are "limited" populations (1–5 pools) and 45% of these contain *Amphianthus* in a single vernal pool; 13% are "moderate" populations (6–14 pools); and 13% are "extensive" population (15–25 pools). Even though *Amphianthus* is known from 17 counties, 12 of these counties (Rockdale, Walton, Douglas, Butts, Putnam, Oglethorpe, Harris, Meriwether, Henry, Pike, Newton, Gwinnett) support only a limited population of *Amphianthus* with eight of these county records confined to a single site. The remaining counties support one to two extensive populations of *Amphianthus* (De Kalb, Greene, Heard, Hancock, and Columbia). The number of individuals in the pools range from as few as a dozen to several thousand, with most pools containing several hundred plants when rainfall is adequate.

Amphianthus occurs at three sites in South Carolina, with seven pools in Lancaster County, one in Saluda County, and four in York County (Rayner 1981, 1986). According to Rayner (1986), during the 1983 or 1984 growing season, six pools supported extensive populations (>200 plants) and six had limited populations (<25 plants) of *Amphianthus*.

Isoetes melanospora was discovered by Canby (1869) on Stone Mountain in De Kalb County, Georgia, and later described by Englemann (1877). Distinguishing characters include a complete velum coverage, dark tuberculate megaspores and short [2–7 cm (0.8–2.8 inches long], spiraled leaves (Boom 1979, 1982). Immature plants of *Isoetes melanospora* may have distichous leaves (Boom 1979, Rury 1978). If frequently hybridizes with *Isoetes piedmontana*, a more common granite outcrop quillwort, which has an incomplete velum coverage, white megaspores and longer leaves [7–15 cm (2.5–5.9 inches long], in habitats which are ecologically intermediate between the two species' typical habitats. Hybrids are intermediate in the above characters (Matthews and Murdy 1969, Boom 1982). Rury (1978) proposed that *Isoetes melanospora* represented a arrested developmental stage of one polymorphic species encompassing *Isoetes melanospora* and *Isoetes piedmontana*. According to Boom (1978, 1982), such confusion regarding *Isoetes melanospora's* taxonomic status stems from the above mentioned hybridization of the two *Isoetes* species and subsequent introgression. C. Taylor and N. Luebke (Milwaukee Public Museum, pers. comm. 1986) maintain that *Isoetes melanospora* and *Isoetes piedmontana* are distinct species. Both species have maintained their morphological distinctiveness while growing in uniform conditions for the last six years, and preliminary electrophoretic data determined the two *Isoetes* to have distinct enzyme profiles. Research by Boom (1980) and Luebke (pers. comm. 1986) demonstrates that reproductive barriers are weak in *Isoetes* and interspecific hybrids are produced readily. *Isoetes melanospora* has been maintained as a distinct taxon in all monographic treatments of the genus (Pfeiffer 1922, Reed 1965, Boom 1979, 1982). Although Evans (1978) synonymized *Isoetes melanospora* in *The Flora of The Carolinas*, he now states that *Isoetes melanospora* will be maintained as a distinct taxon in his treatment of the pteridophytes for the upcoming "Vascular Flora of the Southeastern States" (Evans, University of Tennessee, pers. comm. 1986).

Isoetes melanospora is historically known from 12 sites in central Georgia and one site in South Carolina (Johnson 1938, KcVaugh 1943, Lammers 1958, Burbanck and Platt 1964, Matthews and Murdy 1969, Allison, pers. comm. 1986). Currently, it is thought extant at only five sites in Georgia (De Kalb, Rockdale, and Gwinnett Counties) due to a 54% loss of Georgia populations from habitat destruction. Its status at the South Carolina site is unknown since it has not been observed there since its collection in 1969 (Boom 1979, Rayner, pers. comm. 1986).

Isoetes melanospora occurs with *Amphianthus* at four of its six extant sites in typical habitat as described for *Amphianthus*. At the sixth site, *Isoetes melanospora* is located in several remnant quarry pools. The largest population of *Isoetes melanospora* comprises plants in an estimated 12 pools. Other Georgia populations are confined to one to five pools each.

Isoetes tegetiformans is perhaps the most distincitive species in this genus (Boom 1982). A detailed description of its morphology and anatomy is given by Rury (1978). Distinguishing characters include its distichous, mat-forming growth habit (plants are "rhizomatously" connected), non-dichotomizing roots, and formation of numberous, cauline, adventious buds (Rury 1978, Boom 1979, 1982). Individual plants are most similar to distichous plants of *Isoetes melanospora* with respect to plant size, leaf arrangement and reproductive features (Rury 1978).

Isoetes tegetiformans was described by Rury (1978) from material he collected at Heggie's Rock Preserve in Columbia County, Georgia, from a single vernal pool. Since then, searches of over 120 granite outcrops by J. Allison have resulted in only 10 additional locations (Rury 1985, Allison, pers. comm. 1986). Populations occur in four Georgia counties (Columbia, Hancock, Greene and Putnam) and are confined to porphyritic granite outcrops. Today, *Isoetes tegetiformans* is though extant at all but one site (Allison, pers. comm. 1986, Rury 1986). Seventy percent of the extant sites have only one or two pools with *Isoetes tegetiformans*. At the remaining sites, it has been observed in four to eight pools. Individual pools may contain very few genetic individuals since *Isoetes tegetiformans* is a colony-forming species (Bridges 1986a).

Many of the sites harboring populations of these three granite outcrop endemics have been destroyed or adversely impacted through quarrying, euthrophication from cattle, ORV's, trash dumping, and various forms of vandalism (Garris 1980, Miller 1985, Rayner 1986).

Most populations are on privately-owned lands, including one site

managed by the Nature Conservancy. Four sites are located on public lands, including one owned by the State of Georgia and administered by the Stone Mountain Memorial Association, two owned by De Kalb Country, Georgia, and one by the State of South Carolina (South Carolina Wildlife and Marine Resources Department).

Federal actions involving these species began with section 12 of the Endangered Species Act of 1973, which directed the Secretary of the Smithsonian Institution to prepare a report on those 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. On July 1, 1975, the Service published a notice in the **Federal Register** (40 FR 27823) of its acceptance of the report on the Smithsonian Institution as a petition within the context of section 4(c)(2), now section 4(b)(3)(A), of the Act and of its intention thereby to review the status of those plants. 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. *Amphianthus pusillus* and *Isoetes melanospora* were included in the Smithsonian petition and the 1976 proposal. General comments received in relation to the 1976 proposal were summarized in an April 26, 1978, **Federal Register** publication (43 FR 17909).

The Endangered Species Act Amendments of 1978 required that all proposals over 2 years old be withdrawn. A 1-year grace period was given to proposals already over 2 years old. In the December 10, 1979, **Federal Register** (44 FR 70796), the Service published a notice of withdrawal of the June 16, 1976, proposal, along with four other proposals that had expired. On December 15, 1980, the Service published a revised notice of review for native plants in the **Federal Register** (45 FR 82480); *Isoetes melanospora* was included 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); *Isoetes tegetiformans* and *Amphianthus pusillus* 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 or review. This supplement treated *Isoetes tegetiformans* as a Category-2 species. All three species were included in Category 2 in the September 27, 1985, revised notice of review of plants (50 FR 39526). Status survey reports compiled by Garris (1980), Miller (1985) and Rayner (1986), as well as extensive field searches by Allison (pers. comm. 1986), and pertinent literature (see "References Cited" below), now support all three species' being reelevated to Category 1 and listing as endangered or threatened. The date demonstrated low numbers of plants and contiuning threats to the species.

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 *Isoetes melanospora* and *Amphianthus pusillus* because the 1975 Smithsonian report had been accepted as a petition. On October 13, 1983, October 12, 1984, October 11, 1985, and October 10, 1986, the Service found that the petitioned listing of these species was warranted, but that listing this species was precluded due to other higher priority listing actions. Publication of the present proposal constitutes the next 1-year finding required on or before October 13, 1986, for these three species which are now among the highest priority species for listing.

Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR Part 424) promulgated to implement the listing provisions of the Act 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 *Amphianthus pusillus* Torrey (little amphianthus), *Isoetes melanospora* Englemann (black-spored quillwort), and *Isoetes tegetiformans* Rury (mat-forming quillwort) are as follows:

A. The Present of Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.

Amphianthus pusillus, Isoetes tegetiformans, and *Isoetes melanospora* are restricted to granite outcrops in the Piedmont physiographic region (see "Background' section for specific distributions). The major threat to these species is the destruction and adverse modification of their habitat. Populations of all three taxa have been lost through quarrying (38% for *Isoetes melanospora, 17% for Amphianthus,* 9% for *Isoetes tegetiformans*) and the fate of several extent populations is tenuous since several areas are active quarry sites. Georgia is the world's largest granite producer (Wharton 1978), so the destruction of outcrops from quarrying is expected to continue. Quarrying companies owned 17.4% of those granite outcrops investigated for *Amphiantus* in Georgia (Garris 1980).

Granite outcrops are popular recreational sites and unfortunately such attention and overuse have resulted in damage to the geologic structures and vegetation (Garris 1980). Many of the pools supporting populations of these three taxa have been directly damaged by vehicular traffic. Vehicular traffic during these species' growing season posed a serious threat by uprooting/crushing live plants, hastening the erosion of the pools' rims and displacing soil from the pools (Bridges 1986a, Rayner 1986). ORV's have decreased the vigor of all the South Carolina *Amphianthus* populations (Rayner 1986) and destroyed one Alabama population (Miller 1985). Pools have been further impacted by such vandalistic activities as fire building and littering (Rayner 1986, Garris 1980). Rearrangement of stones in two pools has caused a decline in two populations of *Amphianthus* and *Isoetes melanospora.*

Granite outcrops are often enclosed in pasture. A concentration of grazing animals on these areas has caused damage to vernal pool vegetation through trampling and added nutrients to the water, which favors the growth of more competitive aquatics (Garris 1980, Bridges 1986b). Such eutrophication of vernal pools has eliminated *Amphianthus* from several pools at one site and caused the decline of *Amphianthus* and *Isoetes tegetiformans* at a second area.

Many of the smaller outcrops are used as local dumps or for storing equipment, and such adverse land use has destroyed two populations of *Amphianthus* and one population of *Isoetes melanospora* in Georgia (Garris 1980, Allison, pers. comm. 1986). Flatrocks in the Southeast are being examined as possible repositories for nuclear waste and this poses a potential threat to their habitat (Rayner 1986). Long term monitoring of all three taxa should be initiated in order to measure fluctuations in population size and vigor.

Such data would be helpful in determining the stability of populations are related to weather conditions and distrubance (Bridges 1986a, Rayner 1986).

B. Overutilization for Commercial, Recreational, Scientific or Educational Purposes

Taking for these purposes may pose a threat to these species, especially *Isoetes melanospora* and *Isoetes tegetiformans*, which are extremely restricted in range and low in numbers. Publicity surrounding the listing of these species could increase interest in all three of these unique species, and the sites are easily accessible.

C. Disease or Predation.

These taxa are not known to be threatened by disease or predation.

D. The Inadequacy of Existing Regulatory Mechanisms.

Amphiantus pusillus and *Isoetes melanospora* are officially listed as endangered by the Georgia Department of Natural Resources and are thereby afforded legal protection in the State under the Wildflower Preservation Act of 1973. *Isoetes tegetiformans* is not protected by Georgia law at the present time. Georgia legislation prohibits taking of plants from public lands (without a permit) and regulates the sale and transport of plants within the State. However, Georgia law does not provide protection against habitat destruction, the major threat to these species, and has been inadequate in preventing the further decline of *Isoetes melanospora* and *Amphiantus pusillus* populations at two publicly-owned sites in De Kalb County (Stone Mountain State Park and Mt. Arabia County Park).

Although these species are unofficially recognized as an endangered or threatened components of their flora, South Carolina and Alabama have no State laws protecting them. The Nature Conservancy owns and manages Heggie's Rock Preserve in Columbia County, Georgia, which supports a moderate population (ten pools) of *Amphiuanthus* and a limited population (on pool) of *Isoetes tegetiformans. Amphianthus pusillus* is also protected at Forty-Acre Rock Preserve in Lancaster County, South Carolina, which is owned by the South Carolina Wildlife and Marine Resources Department. Both preserves have regulations restricting collecting and motorized vehicles. However, these regulations are difficult to enforce and the areas are continuing to be disturbed. The Act would enhance the existing protection, provide Federal protection (see "Available Conservation Measures" below), and encourage active management for these species.

E. Other Natural or Manmade Factors Affecting its Continued Existence

These taxa are rare and vulnerable due to the limited amount of potential habitat and specialized microhabitat requirements. Many of the populations consist of small numbers of individuals confined to only one or two pools (see "Background" section), so local extinction through natural causes is possible. *Amphianthus pusillus, Isoetes melanospora,* and *Isoetes tegetiformans* are susceptible to inadvertent destruction because the pools in which they occur are exposed, and thus unprotected from vehicular traffic. These outcrop endemics are not vigorous competitors (Rayner 1986, Luebke, pers. comm. 1986) and could be eliminated by overcrowding and shading (Lammers 1958, Kral 1983). One population of *Amphiantus* and one of *Isoetes melanospora* have been lost through succession (Allison, pers. comm. 1986); however, natural succession is usually too slow to be a significant problem, and new habitat is constantly being created (Burbanck and Platt 1964). A more serious threat is from accelerated succession caused by excessive siltation from disturbance upslope or from eutrophication of the pools from cattle droppings (Bridges 1986b).

Amphianthus is vulnerable due to its requirements for special environmental conditions (moisture, light) for germination and growth and an unknown dormancy period for the seeds (Lunsford 1938, Garris 1980, Rayner 1986). One factor believed to contribute to the rarity of *Amphianthus* is the lack of adaptation for seed dispersal (Lunsford 1938). Preliminary research by Randall (1986) suggests that the principle mode of reproduction in *Amphianthus* is agamospermy (production of seeds by asexual process) and that this lack of genetic variation threatens its adaptive potential. The genetic integrity of *Isoetes melanospora* is threatened due to its frequent hybridization with *Isoetes piedmontana* and subsequent introgression. Hybrids may competitively displace *Isoetes melanospora,* which requires a more specialized type of microhabitat (Boom, pers. comm. 1986).

The Service has carefuly 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 evaluation, the preferred action is to list *Isoetes tegetiformans* and *Isoetes melanospora* as endangered species and to list *Amphianthus pusillus* as a threatened species. *Isoetes melanospora* has been extirpated over most of its historic range (54% of populations destroyed). Furthermore, populations at four of the five remaining sites are confined to five or fewer pools and have significantly decreased in numbers and vigor at several of these areas. *Isoetes tegetiformans* is restricted to a particular type of outcrop (porphyritic granite) and presently receives no protection under Georgia's Wildflower Preservation Act of 1973. At most sites (80%), *Isoetes tegetiformans* occurs in only one or two pools and two of these areas are active quarry sites. These two plants are in danger of extinction throughout all or significant portions of their ranges and therefore qualify as endangered species under the Act.

Threatened status seems appropriate for *Amphianthus pusillus* which has a wider geographic range and two populations in designated Nature Preserves. However, 21% of the populations of *Amphianthus'* have been destroyed and 76% of the extant sites support only a limited population of this senus. Many of the populations face severe threats and *Amphianthus* could become endangered within the foreseeable future; thus it is a threatened species as defined by the Act. Critical habitat is not being designated for reasons discussed in the following 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 the species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not prudent for these species at this time. Publication of critical habitat descriptions and maps would increase public interest and possibly lead to additional treats for these species from collecting and vandalism (see threat factor "B" above). Distinctiveness of the outcrops increases their vulnerability since they tower above the surrounding vegetation and most are easily accessible. No benefit can be identified through critical habitat designation that would outweigh these potential threats. All State agencies and counties will be notified of the general location of the sites and of the importance of protecting these species' habitat. Protection of these species' habitat will be addressed through the recovery process and

through the section 7 jeopardy standard. Therefore, it would not be prudent to determine critical habitat for these species at this time.

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 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, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402, and were recently revised at 51 FR 19926 (June 3, 1986). 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 these species are on private, State-owned, or county-owned land. Currently, no activities to be authorized, funded, or carried out by Federal agencies are known that would affect these species.

The Act and its implementing regulations found at 50 CFR 17.61, 17.62, and 17.63 (for endangered), and 17.71 and 17.72 (for threatened) set forth a series of general trade prohibitions and exceptions that apply to all endangered or threatened plants. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to import or export any endangered or threatened plant, transport it in interstate or foreign commerce in the course of a commercial activity, sell or offer it for sale in interstate or foreign commerce, or to remove it from areas under Federal jurisdiction and reduce it to possession. Seeds from cultivated specimens of threatened plant species are exempt from these prohibitions provided that a statement of "cultivated origin" appears on their containers. Certain exceptions can apply to agents of the Service and State conservation agencies. The Act and 50 CFR 17.62, 17.63, and 17.72 also provide for the issuance of permits to carry out otherwise prohibited activities involving endangered or threatened species under certain circumstances. It is anticipated that few trade permits would ever be sought or issued, since these species are unknown in cultivation and are uncommon in the wild. 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).

Public Comments Solicited

The Service intends that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, any comments or suggestions from the public, other concerned government agencies, the scientific community, industry, or any other interested party concerning any aspect of this proposal are hereby solicited. Comments particularly are sought concerning:

(1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to these species;

(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 subject area and their possible impacts on these species.

Final promulgation of the regulation 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 a final regulation that differs 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 Endangered Species Field Supervisor (see **ADDRESSES** section).

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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The primary author of this proposed rule is Cary Norquist (see ADDRESSES section) (601/965–4900 or FTS 490–4900).

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, 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					
*	*	*	*	*		
Isoetaceae—Quillwort family:						
Isoetes melanospora	Black-spored quillwort	U.S.A. (GA, SC)	E		NA	NA
Isoetes tegetiformans	Mat-forming quillwort	U.S.A. (GA)	E		NA	NA
*	*	*	*	*		
Scrophulariaceae—Snapdragon family:						
Amphianthus pusillus	Little amphianthus	U.S.A. (AL, GA, SC)	T		NA	NA
*	*	*	*	*		

Dated: January 28, 1987.

P. Daniel Smith,

Deputy Assistant Secretary for Fish and Wildlife and Parks.

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