

Petition to List the Flatwoods Salamander (*Ambystoma cingulatum*) on the State of Florida Threatened Species List

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Introduction

By this petition, the Florida Fish and Wildlife Conservation Commission (FWC) is requested to list the flatwoods salamander (*Ambystoma cingulatum*) as a threatened species in the State of Florida (Rule 39-27.004, Florida Administrative Code). This action is warranted because of population declines due to decreases in population numbers, area of occupancy, extent of occurrence, and quality of habitat..

This petition is in response to the recent U.S. Fish and Wildlife Service final rule action adding the flatwoods salamander to the federal List of Endangered and Threatened Wildlife as a threatened species under the authority of the Endangered Species Act of 1973, as amended.

Biological Information

The U.S. Fish and Wildlife Service undertook an extensive review of the biological status of the flatwoods salamander in response to a petition to list the salamander as endangered or threatened. Much of that information was published in the Federal Register (LaChaire 1999) as part of the final rule action listing the salamander as threatened. That information is the basis for this petition, and the final rule as published in the Federal Register is included as an appendix to this petition. Following is a brief summary of the information presented in the USFWS final rule. The final rule information included addresses for obtaining the source information.

The flatwoods salamander occurs in isolated populations in pine flatwoods habitats of the lower Coastal Plain of South Carolina, Georgia, and Florida. Most known populations are in Florida. The primary threat to this salamander is the loss of flatwoods habitat and the isolated, seasonal ponds within the flatwoods required for breeding. Conversion of flatwoods to pine plantations, other agriculture, and urban development have eliminated as much as 80% of originally occurring flatwoods, and loss of flatwoods habitat is continuing. At present rates of loss, nearly all natural flatwoods in Florida will be destroyed within 25 years.

LaClaire (1999) noted that recent surveys had found flatwoods salamanders at only eight percent (8%) of 1,303 potential sites surveyed throughout the species' range. In Florida, 530 sites considered potential flatwoods salamander habitat were surveyed. Salamanders were found at only 15% of the sites.

Additionally, clear-cut harvesting and forest management activities commonly used on pine forests contribute to the degradation of flatwoods salamander habitat. Activities such as soil-disturbing site preparation, lower fire frequencies, high seedling stocking rates, and use of herbicides result in a forest that is not favorable for flatwoods salamanders. Wetland breeding sites are degraded by such practices as ditching ponds, harvesting cypress, and using ponds for slash disposition or firebreaks.

Loss of flatwoods habitat and the isolated seasonal ponds within flatwoods due to conversions to other uses, silvicultural practices, and altered fire cycles have significantly

reduced the number of flatwoods salamanders and their area of occupancy, extent of occurrence, and the quality of habitat the salamander requires. Remaining populations of flatwoods salamanders are likely to decline in numbers and extent as suitable habitat continues to be destroyed or degraded, and the USFWS concluded the species was likely to become endangered in the foreseeable future if no actions were taken to change the current situation. Based upon the information presented in the USFWS final rule, the flatwoods salamander meets several of the criteria of a threatened species as defined in Rule 39-1.004 and, therefore, should be added to the State of Florida Threatened Species List.

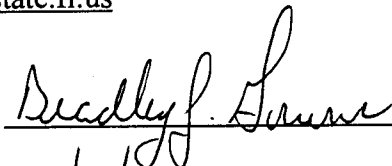
Literature Cited

LaClaire, L. V. 1999. Endangered and threatened wildlife and plants; final rule to list the flatwoods salamander as a threatened species. Federal Register 64:15691-15704.

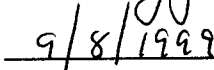
Petitioner Information

Bradley J. Gruver, Ph.D.
Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, FL 32399-1600
(850) 488-3831, SunCom 278-3831
gruverb@gfc.state.fl.us

Signature: _____



Date: _____



Appendix

Copy of LaClaire (1999) attached.

rule published on November 4, 1998, which revised the regulations implementing the affirmative action provisions of the Vietnam Era Veterans' Readjustment Assistance Act of 1974, as amended (VEVRAA). OMB has approved of these revisions under existing PRA control numbers. This rule republishes the table of OMB central numbers in the Code of Federal Regulations.

DATES: This rule is effective April 1, 1999. Information collection requirements contained in the final rule which revised part 60–250 published at 63 FR 59630 have been approved by OMB and must be complied with as of April 1, 1999.

FOR FURTHER INFORMATION CONTACT: James I. Melvin, Director, Division of Policy, Planning, and Program Development, Office of Federal Contract Compliance Programs, Room N3424, 200 Constitution Avenue, NW, Washington DC 20210. Telephone: (202) 693–0102 (voice). Copies of this rule in alternate formats may be obtained by calling OFCCP at (202) 693–0102 (voice). The alternate formats available are large print, an electronic file on computer disk and audiotape. This document also is available on the Internet at <http://www.dol.gov/dol/esa>.

SUPPLEMENTARY INFORMATION:

Paperwork Reduction Act Approval

On November 4, 1998, OFCCP published a final rule (63 FR 59630) revising its regulations at 41 CFR part 60–250 implementing the affirmative action provisions of the Vietnam Era Veterans' Readjustment Assistance Act of 1974, as amended, 38 U.S.C. 4212 (VEVRAA). VEVRAA requires Government contractors and subcontractors to take affirmative action to employ and advance in employment qualified special disabled veterans, veterans of the Vietnam era, and other designated veterans.

OFCCP reviewed the collection of information aspects of the rule in accordance with the PRA and OMB implementing regulations published at 5 CFR part 1320. OFCCP believes that the rule will not result in an increase in paperwork burdens from what was previously required by the OFCCP regulations. In accordance with the PRA, OFCCP submitted to OMB the information collection requirements contained in the rule. OMB approved the information collection requirements in the rule as revisions to existing PRA control numbers 1215–0163 (Construction) and 1215–0072 (Supply and Service).

In accordance with OMB recommendations, 5 CFR 1320.3(f)(3), OFCCP publishes a single table in 41 CFR part 60–999 that lists the OMB-assigned control numbers for information collection requirements contained in OFCCP rules. The list of OMB-assigned control numbers published at 41 CFR Part 60–999 is republished and remains unchanged.

List of Subjects in 41 CFR Part 60–999

Reporting and recordkeeping requirements.

Signed at Washington, D.C. this 25th day of March, 1999.

Bernard E. Anderson,

Assistant Secretary for Employment Standards

Shirley J. Wilcher,

Deputy Assistant Secretary for Federal Contract Compliance.

Part 60–999 of title 41 of the Code of Federal Regulations is hereby amended as follows:

PART 60–999—[AMENDED]

1. The authority citation for part 60–999 continues to read as follows:

Authority: 44 U.S.C. Ch. 35.

2. Section 60–999.2 is republished further convenience of the reader to read follows:

§ 60–999.2 Display.

41 CFR Part where the information collection requirement is located	Current OMB control No.
Part 60–1	1215–0072, 1215–0131, 1215–0163.
Part 60–2	1215–0072.
Part 60–3	3046–0017
Part 60–4	1215–0163.
Part 60–20	1215–0072, 1215–0163.
Part 60–30	1215–0072, 1215–0163.
Part 60–40	1215–0072, 1215–0163.
Part 60–50	1215–0072, 1215–0163.
Part 60–250	1215–0072, 1215–0131, 1215–0163.
Part 60–741	1215–0072, 1215–0131, 1215–0163.

[FR Doc. 99–7835 Filed 3–31–99; 8:45 am]

BILLING CODE 4510–27–M

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AE38

Endangered and Threatened Wildlife and Plants; Final Rule To List the Flatwoods Salamander as a Threatened Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the Fish and Wildlife Service, determine the flatwoods salamander (*Ambystoma cingulatum*) to be a threatened species under the authority of the Endangered Species Act of 1973, as amended (Act). This salamander occurs in isolated populations scattered across the lower southeastern Coastal Plain in Florida, Georgia, and South Carolina. Habitat loss and degradation from agriculture, urbanization, and silvicultural practices have resulted in the loss of more than 80 percent of its pine flatwoods habitat. Surviving populations are currently threatened by the continued destruction and degradation of their habitat. This action extends the protection of the Act for the flatwoods salamander.

EFFECTIVE DATE: May 3, 1999.

ADDRESSES: The complete administrative file for this rule is available for inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Jackson Field Office, 6578 Dogwood View Parkway, Jackson, Mississippi 39213.

FOR FURTHER INFORMATION CONTACT: Ms. Linda LaClaire at the above address, or telephone 601/965–4900, extension 26; facsimile 601/965–4340.

SUPPLEMENTARY INFORMATION:

Background

The earliest reference to the flatwoods salamander, *Ambystoma cingulatum*, was by Cope in 1867 from specimens he collected in Jasper County, South Carolina (referenced in Martof 1968). This salamander is a member of the family Ambystomatidae, the mole salamanders, which contains 15 North American species. Shaffer *et al.* 1991, conducted a phylogenetic (evolutionary history or genealogy) analysis of ambystomatid salamanders and determined that the flatwoods salamander is most closely related to the ringed salamander (*A. annulatum*), which occurs in portions of Arkansas, Missouri, and Oklahoma.

The flatwoods salamander is a slender, small-headed mole salamander that rarely exceeds 13 centimeters (cm) (approximately 5 inches (in)) in length when fully mature (Means 1986, Conant and Collins 1991, Ashton 1992). Adult dorsal color ranges from black to chocolate-black with highly variable, fine, light gray lines forming a netlike or cross-banded pattern across the back (Palis 1996). Undersurfaces are plain gray to black with a few creamy or pearl-gray blotches or spots. Sexual dimorphism (the existence of separable male and female forms) is only apparent in breeding males (swollen cloacal region) or in gravid (with fertilized eggs) females. Adults most closely resemble Mabee's salamander, *A. mabeei*, with which it shares part of its range in South Carolina (Martof 1968). Mabee's salamanders are often more brownish; have light flecking concentrated on their sides rather than the overall pattern of the flatwoods salamander; and have a single row of jaw teeth as opposed to multiple rows in the flatwoods salamander (Conant and Collins 1991).

Flatwoods salamander larvae are long and slender, broad-headed and bushy-gilled, with white bellies and striped sides (Means 1986, Ashton 1992, Palis 1995d). They have distinctive color patterns, typically a tan mid-dorsal (middle of upper surface) stripe followed by a grayish black dorsolateral (back and sides) stripe, a pale cream mid-lateral (side) stripe, a blue-black lower lateral stripe, and a pale yellow ventrolateral (belly) stripe (Palis 1995d). The head has a dark brown stripe passing through the eye from the nostril to the gills (Means 1986).

Optimum habitat for the flatwoods salamander is an open, mesic (moderate moisture) woodland of longleaf/slash pine (*Pinus palustris*/*P. elliotii*) flatwoods maintained by frequent fires. Pine flatwoods are typically flat, low-lying open woodlands that lie between the drier sandhill community upslope and wetlands down slope (Wolfe *et al.* 1988). An organic hardpan, 0.3 to 0.7 meters (m) (1 to 2 feet (ft)) into the soil profile, inhibits subsurface water penetration and results in moist soils with water often at or near the surface (Wolfe *et al.* 1988). Historically, longleaf pine generally dominated the flatwoods with slash pine restricted to the wetter areas (Wolfe *et al.* 1988). Wiregrasses (*Aristida* sp.), especially *A. beyrichiana*, are often the dominant grasses in the herbaceous (non-woody) ground cover (Wolfe *et al.* 1988). The ground cover supports a rich herbivorous invertebrate community that serves as a food source for the flatwoods salamander.

Adult and subadult flatwoods salamanders are fossorial (adapted for living underground) (Mount 1975). They enlarge crayfish burrows (Ashton 1992) or build their own. Captive flatwoods salamanders have been observed digging burrows and resting at night with just the tip of their heads exposed (Goin 1950). Preliminary data indicate that flatwoods salamander males first breed at 1 year of age and females at 2 years of age (Palis 1996). There are no data on survivorship by age class for the species. The longevity record for their close relative, *A. annulatum*, is 4 years, 11 months; however, many Ambystomatidae live 10 years or longer (Snider and Bowler 1992). An adult female flatwoods salamander has been maintained in captivity for 4 years, 4 months (R. Ashton pers. comm. 1998).

Adult flatwoods salamanders move to their wetland breeding sites during rainy weather, in association with cold fronts, from October to December (Palis 1997a). Breeding sites are isolated (not connected to any other water body) pond cypress (*Taxodium ascendens*), blackgum (*Nyssa sylvatica* var. *biflora*), or slash pine dominated depressions which dry completely on a cyclic basis. They are generally shallow and relatively small. Breeding sites in Florida have a mean size of 1.49 hectares (ha) (3.68 acres (ac)) and a mean depth of less than 39.2 cm (15.4 in) (Palis 1997b). These wetlands have a marsh-like appearance with sedges often growing throughout and wiregrasses (*Aristida* sp.), panic grasses (*Panicum* spp.), and other herbaceous species concentrated in the shallow water edges. Trees and shrubs grow both in and around the ponds. A relatively open canopy is necessary to maintain the herbaceous component, which serves as cover for flatwoods salamander larvae and their aquatic invertebrate prey. Sekerak *et al.* 1996, did not capture flatwoods salamander larvae in sample plots with a high proportion of detritus (loose material from the disintegration of rocks and organic material) or open water in a study on the Apalachicola National Forest in Florida. Ponds typically have a burrowing crayfish fauna (genus *Procambarus*) and a diverse macroinvertebrate fauna, but lack large predatory fish (e.g., *Lepomis* (sunfish), *Macropterus* (bass), *Amia calva* (bowfin)).

Before the breeding sites become flooded, the males and females court. The females lay their eggs (singly or in clumps) beneath leaf litter, under logs and sphagnum moss (grows in wet acid areas) mats, or at bases of bushes, small trees, or clumps of grass (Anderson and

Williamson 1976, Means 1986). Egg masses have also been found at the entrances of and within crayfish burrows (Anderson and Williamson 1976). Embryos begin development immediately, but the egg must be inundated before it will hatch. Depending on when eggs are inundated, the larvae usually metamorphose (change into adult form) in March or April; the length of the larval period varies from 11 to 18 weeks (Palis 1995d).

The timing and frequency of rainfall are critical to the successful reproduction and recruitment of flatwoods salamanders. Fall rains are required to facilitate movements to the pond and winter rains are needed to ensure that ponds are filled sufficiently to allow hatching, development, and metamorphosis of larvae. In contrast, too much rainfall in the summer will keep pond levels from dropping below the grassy pond edge, as needed to provide dry substrate for egg deposition. This reliance on specific weather conditions results in unpredictable breeding events and reduces the likelihood that recruitment will occur every year.

Adult flatwoods salamanders leave the pond site after breeding. Studies have suggested a homing ability, based on data that salamanders exit the breeding pond near the point of their arrival (Palis 1997a). In a study by Ashton (1992), flatwoods salamanders were found greater than 1,700 m (1,859 yards (yd)) from their breeding pond. Thus, a flatwoods salamander population has been defined as those salamanders using breeding sites within 3.2 kilometers (km) (2 miles (mi)) of each other, barring an impassable barrier such as a perennial stream (Palis 1997b).

Flatwoods salamanders need to maintain moist skin for respiration and osmoregulation (to control the amounts of water and salts in their bodies) (Duellman and Trueb 1986). Since they may disperse long distances from their breeding ponds to upland sites where they live as adults, desiccation (drying out) can be a limiting factor in their movements. Thus, it is important that areas connecting their wetland and terrestrial habitats are protected in order to provide cover and appropriate moisture regimes during their migration. Using the available information on distances traveled by six species from their breeding sites to terrestrial habitats, Semlitsch (1998) determined the size area around a wetland needed to protect pond-breeding ambystomatid salamanders. The mean distance transversed by the six species was 164.3

m (534 ft). This value was used as a radius to generate a buffer zone surrounding a breeding site. Semlitsch estimated this area would encompass 95% of a population of any of the study species, but cautioned that this may be an underestimate of the habitat used by other species, including the flatwoods salamander. He further clarified that his definition of a buffer zone focused on the conservation of local populations and did not take into account habitat quality or the issues of metapopulation dynamics and landscape-level processes. A metapopulation is an interacting network of local subpopulations with varying frequencies of migration and gene flow among them. Local subpopulations may become extinct, but can be reestablished by individuals from other subpopulations.

High quality habitat for the flatwoods salamander includes a number of isolated wetland breeding sites within a landscape of longleaf pine/slash pine flatwoods having an abundant herbaceous ground cover (Sekerak 1994). Since temporary ponds are not likely permanent fixtures of the landscape due to succession, there will be inevitable extinctions of local populations (Semlitsch 1998). By maintaining a mosaic of ponds with varying hydrologies and by providing terrestrial habitats for use as colonization corridors, some protection against extinction can be achieved. A mosaic of ponds will ensure that appropriate breeding conditions will be achieved under different climatic regimes. Colonization corridors will allow movement of salamanders to new breeding sites or previously occupied ones (Semlitsch 1998).

The historical range of the flatwoods salamander included parts of the States of Alabama, Florida, Georgia, and South Carolina that are in the lower Coastal Plain of the southeastern United States. Knowledgeable researchers discounted a museum record from Mississippi that was previously thought to be a flatwoods salamander (Moler pers. comm. 1988). However, it is possible that flatwoods salamanders once occurred in extreme southeastern Mississippi due to similarities in habitat to historical sites in adjacent Alabama. Recent surveys (Kuss 1988, L. LaClaire pers. obs. 1995) have not documented the occurrence of flatwoods salamanders in Mississippi.

Historical records for the flatwoods salamander are limited. Longleaf pine/slash pine flatwoods historically occurred in a broad band across the lower southeastern Coastal Plain. The flatwoods salamander likely occurred in

appropriate habitat throughout this area (Means pers. comm. 1995). The present distribution of the flatwoods salamander consists of isolated populations scattered across the remaining longleaf pine/slash pine flatwoods. We have compiled 110 historical records for the flatwoods salamander. Historical records are defined as those localities found before 1990. Localities consist of collections made either by sampling breeding sites or of individuals crossing highways on their way to or from breeding sites. During surveys of these localities over the last 8 years, 97 historical records were visited. Flatwoods salamanders were relocated at only 12 localities (12 percent). The exact site was located for 52 records (47 percent) and the general area (within several miles) was determined for 45 others (41 percent). Thirteen sites could not be located due to limited information in the record.

Range-wide surveys of available habitat in Alabama, Florida, Georgia, and South Carolina have been ongoing since 1990 in an effort to locate new populations. A total of at least 1,303 wetlands, which had a minimum of marginal suitability for the flatwoods salamander, were sampled, most of them multiple times. Of these, flatwoods salamanders were found at 110 sites (8 percent success rate). Most surveys were presence/absence searches for larvae in the grassy edges of ponds and we cannot infer an estimate of total population size or viability from these data.

Information on the current status of the flatwoods salamander by State follows:

In Alabama, there are five historical localities for the flatwoods salamander, all in the extreme southern portion of the State. Surveys conducted from 1992 to 1995 at the historical breeding ponds and from 1992 through 1998 at other potential breeding sites were unsuccessful at locating any flatwoods salamander populations (Godwin 1994, pers. comm.; Southeastern Amphibian Survey Cooperative 1998). The salamander was last observed in Alabama in 1981 (Jones *et al.* 1982).

Thirty-three historical records in 19 counties have been reported for Georgia (Goin 1950, Seyle 1994, Williamson and Moulis 1994); however, flatwoods salamanders have not been relocated at any of these sites in recent years. Surveys over the last 8 years of at least 478 wetlands with potential habitat for the flatwoods salamander have resulted in the location of 28 new breeding sites (6 percent success rate). These 28 breeding sites comprise 11 populations (sites within a 3.2 km (2 mi) radius of

one another are considered the same population) (Seyle 1994; Jensen 1995; Moulis 1995a, 1995b; Jensen and Johnson 1998; K. Lutz, The Nature Conservancy of Georgia pers. comm. 1994; D. Stevenson, The Nature Conservancy of Georgia pers. comm. 1996; L. LaClaire pers. obs. 1995, 1997). Most of these breeding sites occur on Fort Stewart Military Installation.

In South Carolina, there are 29 historical records for the flatwoods salamander. Despite annual surveys since 1990, flatwoods salamanders have been relocated at only three of these sites (all sites represent a different population). One site is located on the Francis Marion National Forest and the other two are on private land. A new flatwoods salamander breeding site, representing a fourth population, was recently found on the Francis Marion National Forest (Moulis pers. comm. 1998) during state-wide surveys of approximately 118 wetlands considered to be potential habitat for this species.

In Florida, 39 of the 43 historical sites were relocated (or the general area thought to be the location). Nine (23 percent) contained flatwoods salamanders. Additional survey work over the past 8 years, in 23 counties and at least 530 wetlands with potential habitat, resulted in the location of 81 new breeding sites (15 percent of total sites surveyed). Fifty-six (69 percent) of these new breeding sites occur in Liberty and Okaloosa counties. These sites were found due to extensive surveys of the Apalachicola National Forest and Eglin Air Force Base, both of which contain some of the best remaining pine flatwoods habitat in the Southeast. The total number of extant flatwoods salamander populations known to occur in Florida is 36 with 15 (42 percent) occurring on the Apalachicola National Forest and Eglin Air Force Base (Palis 1993, 1994, 1995a, 1995b, 1995c; Printiss and Means 1996; Means 1998; Southeastern Amphibian Survey Cooperative 1998; H. Cooper, U.S. Fish and Wildlife Service pers. comm. 1998).

The combined State data from all survey work completed since 1990 indicate that 51 populations of flatwoods salamanders are known from across the historical range. Most of these occur in Florida (36 populations or 71 percent). Eleven populations have been found in Georgia, four in South Carolina, and none have been found in Alabama. Some of these populations are inferred from the capture of a single individual. Slightly more than half the known populations for the flatwoods salamander occur on public land (32 of 51, or 63 percent). Federal land holdings

that harbor flatwoods salamanders include the Apalachicola National Forest, Osceola National Forest, St. Marks National Wildlife Refuge, Eglin Air Force Base, Hurlburt Field, and Naval Air Station Whiting Field's Holley Out-lying Field in Florida; Fort Stewart Military Installation and Townsend Bombing Range in Georgia; and Francis Marion National Forest in South Carolina. State agencies manage three additional populations—in Florida, Pine Log State Forest and Pt. Washington State Forest harbor a single population each; and in Georgia, the Mayhaw Wildlife Management Area supports a recently discovered population. The remaining 19 populations are on private land.

Previous Federal Action

We identified the flatwoods salamander as a Category 2 candidate species in our notices of review for animals published in the **Federal Register** on December 30, 1982 (47 FR 58454), September 18, 1985 (50 FR 37958), January 6, 1989 (54 FR 554), November 21, 1991 (56 FR 58804), and November 15, 1994 (59 FR 58982). Before 1996, we defined a Category 2 candidate species as one that we were considering for possible addition to the Federal List of Endangered and Threatened Wildlife, but for which conclusive data on biological vulnerability and threat were not currently available to support a proposed rule. We discontinued designation of Category 2 species in the February 28, 1996, notice of review (61 FR 7956).

On May 18, 1992, we received a petition dated May 8, 1992, from the Biodiversity Legal Foundation, Boulder, Colorado, and Elizabeth Carlton, Gainesville, Florida, to list the flatwoods salamander as an endangered or threatened species throughout its historic range and to designate critical habitat. The petition stated that available evidence indicated that the flatwoods salamander had declined precipitously, that it was on the threshold of extirpation in many locations, and that it had been extirpated from a large portion of its historic range.

We announced a 90-day finding that the petition did not present substantial information that the requested action may be warranted in the **Federal Register** on May 12, 1993 (58 FR 27986). On August 23, 1993, attorneys representing the Biodiversity Legal Foundation, Jasper Carlton, the Director of the Biodiversity Legal Foundation, and Elizabeth Carlton notified us of their intent to sue the Service for

violation of the Act. The petitioners felt that we had, in effect, already made a determination of "may be warranted" through the inclusion of the flatwoods salamander as a Category 2 species on the comprehensive notices of review for animals published before 1993. On April 25, 1994, the suit was filed. In response to an agreed upon settlement of this suit, and based upon our 1994 draft guidance relating to petitions for listing former Category 2 species, we rescinded the 90-day finding announced on May 12, 1993, and replaced it by a finding that the petitioned action may be warranted. We announced this finding in the **Federal Register** on September 21, 1994 (59 FR 48406), and included a request for comments and biological data on the status of the flatwoods salamander.

Section 4(b)(3)(B) of the Act and implementing regulations at 50 CFR 424.14, require the Secretary of the Interior, to the maximum extent practicable, within 12 months of receipt of a petition, to make a finding whether the action requested in the petition is (a) not warranted, (b) warranted, or (c) warranted but precluded. Because of budgetary constraints and the lasting effects of a congressionally imposed listing moratorium from April 1995 to April 1996, we processed petitions and other listing actions according to the listing priority guidance published in the **Federal Register** on December 5, 1996 (61 FR 64475). The guidance clarified the order in which we processed listing actions during fiscal year 1997. The guidance called for giving highest priority to handling emergency situations (Tier 1) and second highest priority (Tier 2) to resolving the status of outstanding proposed listings. We gave third priority (Tier 3) was given to resolving the conservation status of candidate species and processing administrative findings on petitions to add species to the lists or reclassify threatened species to endangered status. The processing of the petition and the proposed rule to list the flatwoods salamander fell under Tier 3. The proposal to list the flatwoods salamander as threatened was published in the **Federal Register** on December 16, 1997 (62 FR 65787).

On May 8, 1998, we published Listing Priority Guidance for fiscal years 1998 and 1999 (63 FR 25502). This guidance gives highest priority (Tier 1) to processing emergency rules to add species to the Lists of Endangered and Threatened Wildlife and Plants (Lists); second priority (Tier 2) to processing final determinations on proposals to add species to the Lists, processing new proposals to add species to the Lists,

processing administrative findings on petitions (to add species to the Lists, delist species, or reclassify listed species), and processing a limited number of proposed or final rules to delist or reclassify species; and third priority (Tier 3) to processing proposed or final rules designating critical habitat. Processing of this final rule is a Tier 2 action.

Summary of Comments and Recommendations

In the December 16, 1997, proposed rule (62 FR 65787) and associated notifications, we requested all interested parties to submit factual reports or information that might contribute to the development of a final rule. We contacted appropriate Federal and State agencies, county governments, scientific organizations and other interested parties and requested their comments. Legal notices announcing the proposal and inviting public comment were published in newspapers across the range of the species. We published notices in *The Albany Herald* and *The Claxton Enterprise* on February 5, 1998; in *The Dothan Eagle* and the *Tallahassee Democrat* on February 6, 1998; in *The Florida Times-Union*, the *Mobile Press Register*, and the *Pensacola News Journal* on February 7, 1998; in the *Coastal Courier* and the *Savannah Morning News* on February 8, 1998; in *The Berkeley Independent* and the *Jasper County Sun* on February 11, 1998; and in *The Darien News* on February 12, 1998. The comment period for the proposal closed on February 17, 1998.

During the initial comment period, Rayonier (Southeast Forest Resources) and the Florida Forestry Association in Florida; Georgia-Pacific and Gilman Paper Company in Georgia; and the American Forest & Paper Association in Washington, D.C., submitted requests for a public hearing. As a result, on March 25, 1998, we published a notice in the **Federal Register** (63 FR 14414) announcing two public hearings and the reopening of the comment period until June 1, 1998. In addition, we announced the public hearings and invited public comment in *The Berkeley Independent* and the *Jasper County Sun* on April 8, 1998; in *The Claxton Enterprise* and *The Darien News* on April 9, 1998; in the *Coastal Courier*, the *Mobile Press Register*, and the *Savannah Morning News* on April 10, 1998; and in the *Tallahassee Democrat*, *The Florida Times-Union*, and the *Pensacola News Journal* on April 11, 1998. We conducted public hearings on April 14, 1998, at the Savannah Technical Institute in Savannah, Georgia, and on

April 15, 1998, at the Hermitage Centre in Tallahassee, Florida. Each hearing began with our opening comments followed by oral statements by the public. In Savannah, Georgia, 9 of the 44 people attending the hearing presented comments. In Tallahassee, Florida, 28 of the 110 people attending the hearing presented comments. At both hearings, the majority of comments concerned the effects listing the flatwoods salamander would have on private landowners.

We received 193 comments (letters and oral testimony) including 7 from State agencies and 186 from individuals, groups, and organizations. Of these, 136 opposed, 39 supported, and 18 were neutral on the proposed action. We received an additional 19 letters from a sixth grade class in Georgetown, South Carolina. The Georgia Department of Natural Resources and Alabama Department of Conservation and Natural Resources supported the listing action. The Florida Game and Fresh Water Fish Commission requested that we consider the development of a Candidate Conservation Agreement instead of listing. We received no comments from the South Carolina Department of Natural Resources. We have reviewed all written and oral comments received during the comment period and have incorporated comments updating the available data in the "Background" or "Summary of Factors Affecting the Species" sections of this rule. We have organized opposing comments and other substantive comments concerning the rule into specific issues, which may be paraphrased. We grouped comments of a similar nature together by issue and summarized as follows.

Issue 1: Status surveys for the flatwoods salamander were insufficient to make a listing determination. Commenters expressed concern over sampling methodologies (including lack of quantitative sampling), sites sampled, interpretation of historical data, and the difficulty in documenting the species' presence at sites. Commenters stated that surveys were not long-term or comprehensive enough to provide evidence for the decline of the species and that more surveys were needed during periods of optimum environmental conditions. Other commenters stated that more data are needed to determine if the remaining populations of the flatwoods salamander represent "normal" natural life cycles of a species without high population densities.

Response: Surveys were conducted during the breeding season using D-frame or flat-bottomed dip nets, a standardized field method for sampling larval amphibians (Shaffer *et al.* 1994).

The Service, State wildlife agencies, and flatwoods salamander researchers recognize the difficulties associated with conducting flatwoods salamander surveys. For this reason, qualified surveyors repeatedly surveyed previously documented flatwoods salamander sites, that still bore evidence of potentially suitable habitat, before concluding that flatwoods salamanders were indeed extirpated from the site. In order to have the highest probability of finding flatwoods salamanders, most surveys for new populations targeted areas of remaining intact pine flatwoods habitat. We do not consider quantitative sampling essential to determine the status of rare species. Rare species, including the flatwoods salamander, are often distributed non-randomly. Random quantitative sampling is less efficient than choosing sites based on criteria such as available habitat.

Since 1990, numerous studies have addressed the status and distribution of the flatwoods salamander (see "Background" section). Weather conditions during these years have covered the range of extremes from drought to flooding. Scientists surveyed a total of at least 1,303 sites where flatwoods salamanders had not previously been documented to determine occupancy by the species, most multiple times. Only 8 percent of these sites were found to harbor the species. Limited access to private lands has hampered survey efforts at some locations; however, we believe that the information gathered during the field work is of sufficient extent and duration to document the rarity of the flatwoods salamander and a decline in its distribution due to habitat alteration or destruction.

Populations of most species are cyclic in nature, responding to such natural factors as weather events, disease, and predation. However, populations of the flatwoods salamander are small, fragmented, and isolated by various human-related factors including habitat conversion. Fifty-five percent of extant populations are widely separated from each other by unsuitable habitat. Only 18 percent of the original acreage of pine flatwoods habitat remains and much of it exists as isolated fragments imbedded in agricultural and urban-dominated landscapes (see "Background" section for more discussion). The isolated nature of flatwoods salamander populations makes them vulnerable to extirpation by random events. If their populations do cycle naturally at low densities, they will be less likely to rebound or become reestablished after a catastrophic event. Extinction becomes a possibility

following a catastrophic event, if adjacent habitat is degraded or destroyed and no source populations to recolonize the area occur within dispersal distance.

Information, studies, field data, and site analyses provided by biologists and others familiar with the flatwoods salamander and its habitat provided adequate information on the distribution, habitat requirements, and threats to the species to warrant the present action. The listing process includes an opportunity for the public to comment and provide information that we evaluate and consider before making a final decision. The additional data provided by respondents during the comment period, and other appropriate information available to us, support our determination that listing is warranted.

Issue 2: More research on the flatwoods salamander's life history and habitat needs is necessary before a listing determination can be made.

Response: We agree that there is limited information on the flatwoods salamander's life history and specific environmental requirements. However, the information standard in section 4(b)(1)(A) of the Act—"A determination to list a species shall be based on the best available scientific and commercial information on the species' status" does not require us to possess detailed or extensive information about the general biology of the species or to make an actual determination of the causes for the species' status to make a listing determination. The Act's information standard requires only that the best available information must support a conclusion that the species meets the Act's definition for threatened or endangered after consideration of the five factors defined in section 4(a) of the Act (see discussion in the "Summary of Factors Affecting the Species" section). The most compelling threat to the flatwoods salamander is the severe reduction of available habitat and its continued loss from conversion, fragmentation, and degradation. Additional information on flatwoods salamander life history and habitat needs is not necessary to support a listing determination. However, this information will be important in the development of a recovery plan and management guidelines for the flatwoods salamander.

Issue 3: Timber harvesting and pine plantation management are not well documented as threats to the flatwoods salamander. The location of existing flatwoods salamander breeding sites adjacent to intensively managed forests indicates the species has some level of

compatibility with pine plantation management. Commenters felt that silvicultural activities considered by the Service to be detrimental or degrading to flatwoods salamander habitat are based on anecdotal or circumstantial evidence rather than data from controlled experiments. Other commenters recommended that the Service more completely describe silvicultural activities, especially those related to continued or future management of pine plantations, that would be likely or unlikely to result in section 9 violations on private lands.

Response: Land uses that have a dramatic adverse impact on flatwoods salamander habitat can present significant threats to the existence of the species. The relationships between timber management and flatwoods salamander populations are undoubtedly complex and need further study. The manner, timing, and extent of silvicultural activities all dictate what effects they may have on the flatwoods salamander and its habitat. We are aware of flatwoods salamander localities adjacent to pine plantations. However, the viability of these populations is unknown. The best available information on the effects of timber management on the flatwoods salamander, cited in the "Background" and "Summary of Factors Affecting the Species" sections, indicates that habitat alteration, including destruction of ground cover vegetation and alteration of hydrology at occupied sites, has been a causative factor in the decline of flatwoods salamander populations. We believe, however, that silvicultural activities that avoid adverse effects to important habitat characteristics (i.e., ground cover, hydrology) are compatible with maintenance of flatwoods salamander populations.

We have relied on the best available scientific and commercial data in making this listing determination. Silvicultural activities are included as just one of the threats identified in our analysis of the status of the species under the "Summary of Factors Affecting the Species" section of this rule. Using the best available information, we have developed guidelines for silvicultural practices that would not be likely to result in a violation of section 9 of the Act (see the "Available Conservation Measures" section). We look forward to working cooperatively with the timber industry, researchers, and others to refine these guidelines and determine what levels of timber extraction, site preparation, and other management activities are most beneficial to the recovery of the flatwoods salamander.

Issue 4: Documentation of historical flatwoods salamander occurrences is limited. In addition, there are no data showing a correlation between pine flatwoods conversion and loss of suitable flatwoods salamander habitat nor data indicating flatwoods salamanders were evenly distributed throughout historic pine flatwoods areas. As a result, commenters felt that the listing proposal was based on habitat trends without supporting data on declining population trends. In fact, new flatwoods salamander populations have been discovered in recent surveys. Therefore, even with the loss of historical sites, the number of known sites is stable or increasing.

Response: In assessing the status of the flatwoods salamander, we reviewed the best available information regarding past and present distribution of the species. In the past, this reclusive species was not frequently studied or collected. However, lack of historical data is not a consideration in determining whether a species is endangered or threatened. It has been well documented that the distribution of pine flatwoods has declined precipitously throughout the Southeast. Therefore, it is logical to assume that populations of animals associated with this habitat, including those of the flatwoods salamander, have also declined. Surveys of the known historical localities, conducted over the past 8 years, have resulted in the relocation of a limited number of populations (12 percent success rate). We believe that newly discovered localities, in counties where the species was not previously recorded, do not represent newly colonized sites but rather extant sites in areas not previously surveyed by field biologists. These newly discovered isolated populations, within the described range of the species, provide evidence of a broad historical distribution of the species across pine flatwoods habitat in the Southeast.

Issue 5: There is no range-wide estimate for the total number of flatwoods salamanders.

Response: We agree that an estimate of the total population is lacking for the flatwoods salamander. However, we considered several additional factors that also are important in developing a biologically accurate species status assessment. The biological security of many declining species is more a function of the number of healthy local populations than the total number of individuals in the wild. Besides considering the number of sites and distribution of subpopulations across the species' range, we also considered

the historical and current rates of decline, distribution and proximity of subpopulations, quantity and quality of available habitat, and imminent and potential threats to the species and its habitat. Therefore, although quantitative sampling has not been completed for the species, pertinent and significant information regarding the other aspects of the species' status is available. The decreasing quality and quantity of flatwoods salamander sites throughout the species' historical and current range are a more accurate reflection of the salamander's status than is a rough estimate of total population.

Issue 6: The flatwoods salamander has always been a rare species and this rarity does not justify listing it as a threatened species.

Response: Historical rarity of the flatwoods salamander has not been quantitatively documented. It is true that historical collections of the species are limited; however, most amphibians have not been extensively surveyed, even species that are considered common. Surveys have confirmed the current rarity of the flatwoods salamander and also the decline in quantity and quality of the pine flatwoods habitat needed for its survival. This decline in habitat was a significant factor in determining that the flatwoods salamander warranted listing.

Issue 7: There is a need to research the impacts of predatory species, such as armadillos and coyotes, on the flatwoods salamander. The imported red fire ant may also be a potential threat to the species.

Response: While the flatwoods salamander has coexisted with a community of predators over time, little is known regarding the effect of predators on the species. Human development, for example, may increase the numbers of armadillos, coyotes, and fire ants that inhabit flatwoods salamander localities. However, there are no data to indicate predators are a significant threat to the flatwoods salamander.

Issue 8: Much of the data used in support of the proposed rule was not peer reviewed. The Service also relied on personal observations that were not part of any report for such subjects as optimum habitat, movements, and activity ranges.

Response: We consider all available information in making a listing determination. This includes reliable unpublished reports, non-literature documentation, and personal communications with experts. The public reviewed the proposed rule, which also was peer reviewed according

to our policy (see "Peer Review" section).

Issue 9: A buffer area defined by a 1.6-km (1-mi) radius around a known flatwoods salamander breeding site is not supported by the scientific literature. Placing a protective area around a breeding site should be on a site-specific basis.

Response: We have received new data (Semlitsch 1998) on protective buffer areas needed around salamander breeding ponds (see discussion in "Background" section). In addition, we have received information gathered from a meeting of herpetologists, State agency biologists, and other experts that was held to review management issues relative to the flatwoods salamander, including the applicability of Semlitsch's paper to the species (Jensen *in litt.* 1998). Of the six species reviewed by Semlitsch, the marbled salamander (*A. opacum*) was judged to be the most similar in habitat needs to the flatwoods salamander. The maximum recorded distance moved by the marbled salamander was 450 m (1,476 ft) (see Semlitsch 1998). Therefore, in order to estimate the dimensions of a buffer that would protect the majority of a flatwoods salamander population, a radius of 450 m (1,476 ft) out from the wetland edge was suggested. Forest management recommendations within the buffer included harvesting only in dry periods, clear-cutting if no more than 25 percent of the buffer is cut at each harvest, restricting the use of mechanical site preparation techniques or other actions that would disturb the upper soil layers, and restricting herbicides to use for control of woody shrub encroachment only when fire could not be employed. An inner zone within the buffer with a radius of 164 m (538 ft) out from the wetland edge, the area needed to protect 95 percent of an ambystomatid population as estimated by Semlitsch, was considered to be important. Within this inner zone, it was recommended that clear-cutting be excluded.

Based on this new information, we have revised the dimensions of the buffer area and associated management scenario that would *not* be considered "take" (see discussion of violations of section 9 under "Available Conservation Measures" section). Whether or not "take" is a consideration, we will work with any interested landowner to determine the specific set of conditions appropriate for protection of a known flatwoods salamander site on his or her property. Depending on the needs of the landowner, a protective area might be developed in conjunction with the issuance of an incidental take permit

through the habitat conservation planning process.

Issue 10: The social and economic impacts of listing the flatwoods salamander were not considered. Timber harvest will be restricted in the Southeast and the timber industry will be negatively impacted. Listing will negatively affect the ability of non-industrial private landowners to make a profit from their lands and they should be compensated for any financial loss resulting from the listing of the flatwoods salamander. Without financial compensation, there is no incentive for landowners to keep land in timber, and habitat available for the flatwoods salamander will be lost through conversion to agriculture and urban development.

Response: Under section 4(b)(1)(A) of the Act, we must base a listing determination solely on the best scientific and commercial data available. The legislative history of this provision clearly states the intent of Congress to "ensure" that listing decision are "... based solely on biological criteria and to prevent nonbiological criteria from affecting such decisions . . ." H.R. Rep. No. 97-835, 97th Cong., 2d Sess. 19 (1982). As further stated in the legislative history, "... economic considerations have no relevance to determinations regarding the status of species . . ." *Id.* at 20. Because we are specifically precluded from considering economic impacts, either positive or negative, in a final decision on a proposed listing, we did not consider the economic impacts of listing the flatwoods salamander.

Issue 11: As an alternative to listing, populations of flatwoods salamanders should be established on Federal and State lands by using animals removed from private lands or bred through captive propagation.

Response: The purpose of the Act is to provide a means whereby the natural ecosystems upon which endangered and threatened species depend may be conserved. Loss of suitable habitat is the primary threat to the flatwoods salamander. Therefore, continued loss of habitat by removing the salamander from occupied sites would be counter to protection for the species and would accelerate its decline. We are working with the Department of Defense, the U.S. Forest Service, and States within the range of the salamander to ensure that conservation of the flatwoods salamander is carried out on all public lands where it currently exists. While several Federal land holdings support apparently stable populations of flatwoods salamanders, they represent widely separated sites that compose a

small fraction of the total range of the species. We believe protection of these sites alone would not alleviate the need to list the flatwoods salamander.

Issue 12: The Florida Game and Fresh Water Fish Commission (Commission) proposed that the concept of a Candidate Conservation Agreement (CCA) be explored as an alternative to listing. The Commission stated that a CCA, involving voluntary cooperation by private landowners, would provide a greater benefit to the species than listing. The additional benefit of a CCA would result because more landowners would be willing to participate in the recovery of the flatwoods salamander if Federal intervention and regulation was minimized. Another governmental agency, the Florida Division of Forestry, expressed support for this concept. Many other commenters supported some type of voluntary public/private sector cooperation instead of listing.

Response: CCAs are formal agreements between the Service and one or more parties (e.g., landowners, land managers, or State fish and wildlife agencies) to address the conservation needs of proposed or candidate species. The participants take on the responsibility of developing the CCA, and voluntarily commit to implementing specific actions that will remove or reduce the threats to the subject species, thereby contributing to stabilizing or restoring the species. The ultimate goal of any CCA is to adequately remove threats to the species, so that the need for listing under the Act can be eliminated.

To preclude the need to list the flatwoods salamander, a sufficient number of CCAs on both public and private lands would have to be developed and implemented to adequately remove threats, so that we could conclude that protection under the Act was no longer be needed. Although the Commission suggested the development of such an agreement, they did not provide a specific plan. Also, the Commission would not have control over implementation of such a plan since they own or manage land containing only two of the approximately 50 known flatwoods salamander populations.

We fully realize that recovery of the flatwoods salamander will partially depend upon voluntary cooperation of private landowners, and welcome them as partners in the recovery effort. We will work to provide technical assistance to those property owners and land managers who wish to implement conservation measures for this species.

Although we cannot delay the listing process while an agreement or plan is

being developed, we still encourage their development subsequent to a final listing decision. Such plans may serve as a foundation for a recovery plan and could lead to earlier recovery and delisting.

Issue 13: The Commission requested that a listing decision be postponed for 12 months to allow development of a CCA in Florida. The Florida Division of Forestry also requested that a listing decision be postponed for 1 year.

Response: The Act requires that we use the best scientific and commercial information available to make a final determination on a proposed listing within 1 year of the date a species is proposed. The flatwoods salamander was proposed in December 16, 1997. The Act stipulates that this 1-year deadline may be extended for up to 6 months to solicit additional data only if there is substantial scientific disagreement among the scientists knowledgeable about the species regarding the sufficiency or accuracy of the data used in the proposed determination. We find no substantial disagreement among scientists knowledgeable about the flatwoods salamander that would serve as a basis for extension of the 1-year deadline.

Issue 14: Use of herbicides and fertilizers has not been proven to be detrimental to flatwoods salamanders. In fact, given the proper selection and use of herbicide, rate, method, and timing, herbicides may be useful in maintaining or enhancing habitat conditions for the flatwoods salamander.

Response: Management of flatwoods salamander habitat is best accomplished through a regime of growing season burns. In some cases though, burning may not be a viable option, due to smoke liability or other concerns, and herbicides may be needed to control woody vegetation. Amphibians have shown a vulnerability to herbicides and other chemicals in their environment (see factor E under "Summary of Factors Affecting the Species"). However, we agree there is likely a role for herbicides in the management of flatwoods salamander habitat if Best Management Practices (BMPs) are used and herbicides are carefully selected to target hardwood encroachment.

Issue 15: All private landowners who would be affected by a potential listing of the flatwoods salamander were not contacted. They should have a say in the listing decision.

Response: We published legal notices in 12 local newspapers. In addition, we contacted appropriate Federal and State agencies, county governments, scientific organizations, forestry associations, and

other interested parties. The public had the opportunity to comment on the proposed rule for over 4 months. The Act requires listing be based solely on the five criteria in section 4(a).

Issue 16: If the flatwoods salamander is listed, Alabama should be omitted from the listed range. The Service can then concentrate recovery efforts in States where the species still occurs.

Response: We will concentrate recovery efforts in States where the species still occurs. It is possible, however, that isolated populations of the flatwoods salamander may still be extant in Alabama. Nevertheless, species may be listed in the States where they have been documented to occur historically, regardless of the current distribution of the species.

Issue 17: State BMPs designed to control water quality problems with chemical applications are already in place that would protect flatwoods salamander breeding ponds.

Response: Landowners who use State BMPs around existing flatwoods salamander breeding ponds will be benefitting the salamander. These BMPs do not protect against the conversion of upland sites, however. Thus, the use of BMPs does not completely alleviate the threat of habitat destruction to the flatwoods salamander.

Issue 18: The 3.2 km (2 mi) distance used as a basis for identifying separate populations of the flatwoods salamander is not justified based on the movement data from other ambystomatids. As a result, the actual number of populations may be higher than that reported by Service.

Response: The only movement data available for the flatwoods salamander indicate the species is capable of moving distances greater than 1,700 m (1,859 yd). Historically, the species was most likely distributed as metapopulations dispersed throughout available pine flatwoods habitat. We believe, based on the best available data on the flatwoods salamander, that the use of a 3.2 km (2 mi) distance as a basis for identifying separate populations is justified.

Issue 19: Listing the flatwoods salamander will halt timber sales on public lands.

Response: Section 7(a) of the Act states that Federal agencies have a responsibility to conserve endangered and threatened species and use their authorities to further the purposes of the Act. On Federal lands containing populations of flatwoods salamanders, modifications of some timber practices may be needed in the vicinity of known breeding sites to further the recovery of the species. However, we consider

appropriate timber management to be the land use activity most compatible with the continued existence of the flatwoods salamander (see discussion of section 9 in "Available Conservation Measures" section).

Issue 20: The conversion of pine flatwoods habitats to pine plantations has been reduced and does not represent a threat to the flatwoods salamander. Since future conversion to plantations will be minimal, more flatwoods salamander sites will be threatened by urbanization and agricultural development.

Response: Most of the remaining pine flatwoods habitat is in private ownership. Many consulting foresters recommend that private landowners convert existing pine flatwoods sites to short rotation timber management with high stocking rates to maximize short-term financial gain. Data compiled through State forest inventories between 1989 and 1995 indicate that the loss of pine flatwoods through land use conversion is still occurring (see discussion in factor A of "Summary of Factors Affecting the Species"). Therefore, we consider conversion of existing flatwoods sites to pine plantations to be a continuing threat, along with conversion of habitat through urban and agricultural development.

Issue 21: The proposed rule did not provide compelling reasons for not designating critical habitat.

Response: We have determined that designation of critical habitat will not provide additional benefit beyond that achieved by the listing of the flatwoods salamander (see the "Critical Habitat" section). We may reevaluate designation of critical habitat at some future time if new information becomes available or circumstances change.

Peer Review

In conformance with our policy on information standards, published on July 1, 1994 (59 FR 34270), we solicited the expert opinions of independent specialists regarding pertinent scientific or commercial data and assumptions relating to the supportive biological and ecological information for the flatwoods salamander. The purpose of such review is to ensure that the listing decision is based on scientifically sound data, assumptions, and analyses, including input of appropriate experts and specialists.

Three peer reviewers commented upon the accuracy of the information presented within the proposed rule. We asked them to provide any relevant scientific data relating to taxonomy, distribution, or to the supporting

biological and ecological data used in the analysis of the factors for listing. All reviewers expressed their support for Federal listing of the flatwoods salamander. We have incorporated their comments into the final rule, as appropriate, and summarized their observations below.

All three reviewers discussed threats to the flatwoods salamander. Threats identified included loss of forested pine flatwoods habitat, alteration of hydrology of existing pine flatwoods sites, soil disturbance, fire suppression, and changes in ground cover that resulted in a sparse herbaceous component and a dense weedy shrub layer. Based on their field experience with the species, all three reviewers expressed the view that the decline of the flatwoods salamander was a result of loss of both wetland and forested habitat. One reviewer stated that Federal listing of the species was important, because at present there is no protection against the loss of the flatwoods salamander's habitat.

One reviewer stated that due to the cyclic nature of breeding in many amphibians, caution should be used in interpreting the absence of flatwoods salamanders at previously occupied sites. The reviewer felt that the status of amphibians, including the flatwoods salamander, should be evaluated based on the disappearance of known habitats (see discussion of habitat loss under factor A in "Summary of Factors Affecting the Species" section).

The reviewers discussed specific impacts to the flatwoods salamander. One reviewer, experienced with the species and its habitat in several States, described quality sites as fire-maintained, open, mature longleaf pine woodland with a well developed and diverse herbaceous ground cover. When these conditions were found, flatwoods salamanders could be abundant. On the other hand, when flatwoods sites were ditched and/or drained and converted to even-aged slash pine plantations with a sparse herbaceous component, flatwoods salamanders were rarely found. Another of the reviewers also agreed that hydrologic changes and heavy soil disturbance were a problem for the species. This reviewer pointed to drainage of habitat types as a threat to the species that probably reduces overall activities including feeding. He also stated that direct mechanical impact to upper soil layers likely destroys the burrow complexes required by this fossorial species.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, we determine that the flatwoods salamander should be classified as a threatened species. We followed procedures found at section 4(a)(1) of the Act and regulations (50 CFR part 424) implementing the listing provisions of the Act. 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 the flatwoods salamander (*Ambystoma cingulatum* Cope) are as follows:

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

The major threat to the flatwoods salamander is loss of both its longleaf pine/slash pine flatwoods terrestrial habitat and its isolated, seasonally ponded breeding habitat. The combined pine flatwoods (longleaf pine-wiregrass flatwoods and slash pine flatwoods) historical acreage was approximately 12.8 million ha (32 million ac) (Wolfe *et al.* 1988, Outcalt 1997). Today, the combined flatwoods acreage has been reduced to 2.3 million ha (5.6 million ac) or approximately 18 percent of its original extent. These remaining pine flatwoods (non-plantation forests) are typically fragmented, degraded, second-growth forests.

Land use conversions, primarily urban development and conversion to agriculture and pine plantations, eliminated large acreages of pine flatwoods (Schultz 1983, Stout and Marion 1993, Outcalt and Sheffield 1996, Outcalt 1997). Surveys of historical flatwoods salamander localities documented the destruction of nine sites from urban development or agriculture and loss of three additional sites due to their conversion to pine plantations. State forest inventories completed between 1989 and 1995 indicate that flatwoods losses through land use conversion are still occurring (Outcalt 1997). In Florida and Georgia, the States where flatwoods habitat is concentrated and where most flatwoods salamander populations occur, 52,600 ha (130,000 ac) were lost to urban and agricultural use during the survey cycle of 8 years (Outcalt 1997). Conversion of existing pine flatwoods second-growth forests to managed plantations is also continuing. In Georgia and Florida, there was a yearly loss of this habitat to pine plantations of nearly 20,200 ha (50,000 ac) in each State with a loss of

24 percent and 20 percent, respectively, during the 8-year survey interval (Outcalt 1997). Most of the remaining second-growth pine flatwoods (56 percent) occur on private non-industrial lands (Outcalt 1997). Many of these sites are converted after harvest to intensive management regimes (i.e., heavy mechanical site preparation, high stocking rates) similar to pine plantations. Urban development is expanding into forested areas, especially in rapidly developing areas of Florida and Georgia. If present rates of loss continue, in 25 years nearly all natural pine flatwoods stands could be destroyed in these two States (Outcalt 1997).

Flatwoods salamander wetland breeding sites have also been degraded and destroyed. Alterations in hydrology, agricultural and urban development, silvicultural practices (described in more detail below), dumping in or filling of ponds, conversion of wetlands to fish ponds, domestic animal grazing, and soil disturbance reduced the number and diversity of these small wetlands (Vickers *et al.* 1985, Ashton 1992). Hydrological alterations represent the primary threat to flatwoods salamander breeding sites. Size and suitability of wetlands as breeding sites depend on subsoil moisture, the permeability of the hardpan, the pond's drainage area, and other factors. Alterations to any of these factors can affect the pond's ability to hold water and function as a breeding site.

Forest management strategies commonly used on pine plantations contribute to degradation of flatwoods salamander forested and wetland habitat. These include soil-disturbing site preparation techniques, lowered fire frequencies and reductions in average area burned per fire event (see factor E), high seedling stocking rates, and herbicide use, which may reduce plant diversity in the understory. The result of these strategies is a forest that approaches even-age structure, has a dense understory, and low herbaceous cover. Forestry practices that directly affect wetland breeding sites include ditching ponds or low areas to drain water from a site, converting second-growth pine forests to bedded pine plantations, harvesting cypress from the ponds, disposing of slash in wetlands during timber operations, using ponds as part of ditched fire breaks, using fertilizers near wetlands which can result in eutrophication (water enriched in nutrients), and disturbing the soil at a wetland (Vickers *et al.* 1985; Ashton 1992; Means *et al.* 1996; Palis, 1997b).

Clear-cut harvesting of forested sites appears to be an additional threat. Studies have demonstrated negative short-term impacts on the density of local amphibian populations as a result of clear-cuts (deMaynadier and Hunter 1995), although amphibian species composition and richness may be unchanged (Enge and Marion 1986, Dominigue-O'Neill 1995). The decrease in density of some species of amphibians may be the result of alterations in hydroperiods, decreased relative humidity, and disturbance of plant litter, stumps, and fallen logs used as refugia (Enge and Marion 1986). Amphibians, especially salamanders, are vulnerable to habitat drying and reduction of refugia because their moist permeable skin acts as a respiratory organ and must remain moist to function properly (Duellman and Trueb 1986). Raymond and Hardy (1991) monitored the mole salamander (*A. talpodieum*) at a breeding site adjacent to a recent clear-cut. They found that salamanders were displaced from the cut side of the pond and that there was lowered survivorship in individuals of the breeding population that immigrated to the breeding pond from the clear-cut.

Means *et al.* 1996, implicated silvicultural practices affecting both upland and breeding habitats in the decline of a flatwoods salamander population monitored for over 20 years in the panhandle of western Florida. They attributed the decline at this site to habitat modifications resulting from clear-cutting, conversion of the site to a pine plantation, and fire suppression. Habitat modifications included soil disturbance, hydrologic changes, canopy closure, and loss of herbaceous ground cover.

Due to the cyclic nature of breeding in many amphibians, an analysis of habitat quality is important in providing information to be used in interpreting absence of a species from a site. LaClaire (1997) collected data on habitat quality from recent surveys of historical sites where flatwoods salamanders were not relocated (85 of 97, or 88 percent). Data combined aspects of both wetland and upland habitat attributes at each site. Habitat quality was characterized as none (site destroyed), low (flatwoods salamanders unlikely), moderate (salamanders possible but habitat degraded), or high (habitat appears suitable for flatwoods salamanders). Fifty-three of the unoccupied historical sites (53 of 85, or 62 percent) had been destroyed or were of low or moderate habitat quality. Contributing factors in the loss of habitat suitability included conversion of sites to agriculture, home sites, pastures, and highways.

Conversion of sites to slash pine plantations was also an important factor in the loss of habitat suitability (L. LaClaire pers. obs. 1997).

In Florida, Palis (1997b) characterized habitat quality surrounding historical flatwoods salamander breeding ponds, where the species has been found in recent surveys. Each site was assigned a score based on pine species dominance and disturbance (second-growth flatwoods versus plantation sites) and the relative abundance of wiregrass (*Aristida* sp.) ground cover. Wiregrass was chosen as a factor of habitat quality because its loss has been used as an indicator of site degradation from fire suppression and/or soil disturbance (Clewett 1989). In Palis' study, approximately 70 percent of the active breeding sites were surrounded by second-growth longleaf or slash pine flatwoods with nearly undisturbed wiregrass ground cover. In general, Palis found that the extant populations of the flatwoods salamander principally occurred on forest lands managed for long rotation, saw-timber production, rather than on short rotation pine plantations managed for pulp production.

Road construction plays a part in habitat degradation and destruction. At least one historical flatwoods breeding site has been filled in association with the construction of a road (Palis 1993). Roads increase the accessibility of breeding ponds to off-road vehicle enthusiasts that use pond basins for "mud bogging," which disturbs the soil and vegetation and degrades the quality of a site for flatwoods salamander breeding. Roads may also alter the quality of isolated wetlands by draining, damming, or redirecting the water in a basin and contributing hydrocarbons and other chemical pollutants via runoff and sedimentation.

A number of habitat degradation factors are implicated in the decline of one South Carolina flatwoods salamander population monitored for over 20 years (Moulis 1987, Bennett pers. comm. 1997). The site is bisected by a road that flatwoods salamanders have to cross to reach their breeding site. Much of the upland area, in which the salamanders dwell as adults, has undergone urban development (Bennett pers. comm. 1997). In addition, fire suppression has resulted in the loss of the open, grassy pond edge associated with quality breeding sites. Habitat quality at this site has degraded to the point where successful reproduction and recruitment are infrequent and the population is at risk (LaClaire pers. obs. 1995).

Extensive surveys have been conducted over the past 8 years in Alabama, Georgia, Florida, South Carolina, and Mississippi to search for flatwoods salamanders at historical localities and at other potential sites. The low level of success of these surveys is believed to be a reflection of both the loss of upland and isolated wetland breeding habitat and the reduction in the quality of the remaining habitats.

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

Overcollecting for scientific purposes may have contributed to the decline of a South Carolina population, which was impacted also by habitat degradation. Between 1970 and 1976, a minimum of 84 adults and 870 larvae were collected in this area (Savannah Science Museum collection records). Only two flatwoods salamanders have been captured at this locality since 1990, in spite of annual monitoring.

Overcollecting does not presently appear to be a significant threat to the species; however, it may become a problem if the specific breeding locations become available to the general public. The rarity, uniqueness, and attractiveness of the species make the flatwoods salamander a candidate for the pet trade, should it become easy to obtain.

At some sites, Palis (1996) found that the harvest of crayfish for bait was associated with the killing of larval flatwoods salamanders. However, while this practice has caused the loss of some individuals, it is not currently thought to be a significant threat to the species as a whole.

C. Disease or Predation

Disease is currently unknown in the flatwoods salamander.

Exposure to increased predation from fish is a potential threat to the flatwoods salamander when isolated, seasonally ponded breeding sites are converted to more permanent wetlands inhabited by fish. Ponds may be modified specifically to serve as fish ponds or sites may be altered due to the construction of drainage ditches or firebreaks, which provide avenues for fish to enter the wetlands. Studies of other ambystomatid species have demonstrated a decline in larval survival in the presence of predatory fish (Semlitsch 1987, 1988). Ashton (*in litt.* 1998) witnessed predation on ornate chorus frogs (*Pseudacris ornata*) by fire ants and stated that fire ants may pose a threat to the flatwoods salamander.

D. The Inadequacy of Existing Regulatory Mechanisms

Regulatory mechanisms currently in effect do not provide adequate protection for the flatwoods salamander and its habitat. There are no existing regulatory mechanisms for the protection of the upland habitats where flatwoods salamanders spend most of their lives. Section 404 of the Clean Water Act is the primary Federal law that has the potential to provide some protection for the wetland breeding sites of the flatwoods salamander. Under section 404, nationwide permit 26 allows these wetlands to be filled with no review process if wetlands are less than 0.13 ha (1/3 ac), and with only minimal review if they are between 0.13 ha and 1.2 ha (3 ac) in size.

Some populations on Federal lands have benefitted where prescribed burning has been used as a regular management tool. However, multiple use priorities on public lands, such as timber production, and military and recreational use, make protection of the flatwoods salamander secondary. The National Environmental Policy Act requires an intensive environmental review of projects that may adversely affect a federally listed species, but project proponents are not required to avoid impacts to non-listed species.

At the State and local levels, regulatory mechanisms are also limited. The flatwoods salamander is listed as a rare protected species in the State of Georgia (Seyle 1994). This designation protects the species by prohibiting actions that cause direct mortality or the destruction of its habitat on lands owned by the State of Georgia and by preventing its sale, purchase, or possession (Jensen pers. comm. 1997). At present, there is only one known flatwoods salamander population on lands owned by the State of Georgia. In South Carolina, the flatwoods salamander is listed as endangered (Bennett 1995). Prohibitions extend only to the direct take of the flatwoods salamander (Bennett pers. comm. 1997). These regulations offer no protection against the most significant threat to the flatwoods salamander, which is loss of its habitat. The flatwoods salamander is considered rare in Florida by the Florida Committee on Rare and Endangered Plants and Animals (Ashton 1992); however, there are no protective regulations for this species or its habitat in the State (Moler 1990).

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Fire is needed to maintain the natural pine flatwoods community. Ecologists

consider fire suppression the primary reason for the degradation of remaining longleaf pine forest acreage. Wolfe *et al.* (1988) reported that pine flatwoods naturally burn every 3 to 4 years, probably most commonly in the summer months. Sampling of longleaf pine flatwoods sites in Florida indicated that less than 30 percent of sites on private lands received prescribed burning to mimic the effects of natural fire (Outcalt 1997). The disruption of the natural fire cycle has resulted in an increase in slash pine on sites formerly dominated by longleaf pine, an increase in hardwood understory, and a decrease in herbaceous ground cover (Wolfe *et al.* 1988; Means pers. comm. 1995). Ponds surrounded by pine plantations and protected from the natural fire regime become unsuitable flatwoods salamander breeding sites, due to canopy closure and the resultant reduction in emergent herbaceous vegetation needed for egg deposition and larval development sites (Palis 1993). Of the 13 historical flatwoods salamander localities altered to the point where the habitat was no longer suitable, fire suppression was a contributing factor in at least 5 (38 percent). Current forest management is moving away from burning as a management tool due to liability considerations and concerns that fire will damage the quality of the timber.

Habitat fragmentation of the longleaf pine ecosystem, resulting from habitat conversion, threatens the survival of the remaining flatwoods salamander populations. Fifty-one populations occur across four States. Fifty-five percent (28 of 51) of these populations are widely separated from each other by unsuitable habitat. Research conducted in Florida documented that 25 percent of remaining longleaf pine flatwoods sites were isolated fragments imbedded in agricultural and urban-dominated landscapes (Outcalt 1997). Studies have shown that the loss of small fragmented populations is common, and recolonization is critical for their regional survival (Fahrig and Merriam 1994, Burkey 1995). As patches of available habitat become separated beyond the dispersal range of a species, populations are more sensitive to genetic, demographic, and environmental variability and may be unable to recover (Gilpin 1987, Sjogren 1991). Amphibian populations may be unable to recolonize areas after local extinctions due to their physiological constraints, relatively low mobility, and site fidelity (Blaustein *et al.* 1994).

Roads contribute to habitat fragmentation by isolating blocks of remaining contiguous habitat. They may

disrupt migration routes and dispersal of individuals to and from breeding sites. In addition, vehicles may also kill flatwoods salamanders when they are attempting to cross roads (Means 1996a).

Pesticides and herbicides may pose a threat to amphibians such as the flatwoods salamander, because their permeable eggs and skin readily absorb substances from the surrounding aquatic or terrestrial environment (Duellman and Trueb 1986). In frogs, use of agricultural pesticides has resulted in lower survival rates, deformities, and lethal effects on tadpoles (Sanders 1970, FROGLOG 1993). Other negative effects of commonly used pesticides and herbicides on amphibians include delayed metamorphosis, paralysis, reduced growth rates, and mortality (Bishop 1992). Herbicides may also alter the density and species composition of vegetation surrounding a breeding site and reduce the number of potential sites for egg deposition, larval development, or shelter for migrating salamanders.

Long-lasting droughts or frequent floods may affect local flatwoods salamander populations. Although these are natural processes, other threats, such as habitat fragmentation and habitat degradation, may stress a population to the point that it cannot recover or recolonize other sites.

We have 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 the flatwoods salamander as threatened. Activities associated with conversion of forests to agriculture and urban development, silvicultural practices, and the disruption of natural fire cycles have contributed to significantly reducing the range and habitat of this species. Remaining populations are vulnerable as suitable habitat continues to be lost or degraded by these activities. While not in immediate danger of extinction, the flatwoods salamander is likely to become an endangered species in the foreseeable future if the present trend continues.

Critical Habitat

Critical habitat is defined in section 3 of the Act as: (i) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management consideration or protection; and (ii) specific areas

outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures needed to bring the species to the point at which listing under the Act is no longer necessary.

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time the species is determined to be endangered or threatened. Our regulations (50 CFR 424.12(a)(1)) state that designation of critical habitat is not prudent when one or both of the following situations exist: (i) The species is threatened by taking or other activity and the identification of critical habitat can be expected to increase the degree of threat to the species or (ii) Such designation of critical habitat would not be beneficial to the species. We find that designation of critical habitat is not prudent for the flatwoods salamander.

Critical habitat designation, by definition, directly affects only Federal agency actions. Activities that might affect the flatwoods salamander on Federal lands include forestry management, military activities, and Federal actions that would impact the hydrology of the wetlands used by the flatwoods salamander for reproduction. Such activities would be subject to review under section 7(a)(2) of the Act, whether or not critical habitat was designated.

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 a listed species or to destroy or adversely modify its critical habitat. Common to definitions of the "jeopardy" and "adverse modification" standards is an appreciable detrimental effect on both survival and recovery of the species. We believe that any significant adverse modification or destruction of flatwoods salamander habitat, to the extent that survival and recovery are appreciably diminished, would likely jeopardize this species' continued existence. Therefore, habitat protection from Federal actions can be accomplished for the flatwoods salamander through application of the section 7 jeopardy standard. We are currently working with the appropriate Federal land managing agencies to identify, protect, and manage flatwoods salamander habitat.

Federal permit issuance on private lands would also be subject to review;

however, the primary activities affecting habitat for the flatwoods salamander on private lands are silvicultural, and are not subject to the Federal review process under section 7. However, activities that may result in a taking of the flatwoods salamander that are not already authorized by a Federal agency under section 7, do require authorization under section 10 of the Act. Section 10(a)(1)(B) authorizes us to issue permits for take of listed species incidental to otherwise lawful activities such as agriculture, forestry, and urban development. A habitat conservation plan that is submitted by the applicant as part of the permit application would identify measures to be taken to conserve the species. We must also ensure, under section 7 of the Act, that the issuance of an incidental permit will not jeopardize the continued existence of the listed species. Thus, habitat protection on private lands may be accomplished through section 10 of the Act.

On private lands, industrial timber landowners are cooperating with us to conduct surveys for the flatwoods salamander and to develop management strategies to protect its habitat. We will continue to coordinate with State and Federal agencies, as well as private property owners and other affected parties through the recovery process to manage habitat for the flatwoods salamander.

We believe that any potential benefits to critical habitat designation are outweighed by additional threats to the species that would result from such designation. Collecting for scientific and recreational purposes is a potential threat to the survival of the flatwoods salamander (see factor B in the "Summary of Factors Affecting the Species" section). Flatwoods salamanders are a rare and attractive species, and these characteristics make them potentially valuable in the pet trade. The collection of amphibians and reptiles for the pet trade has increased in recent years. For example, all box turtles have been placed on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora due to the increased commercialization of these species. Collection of amphibians and reptiles for personal use and the pet trade is common in the vicinity of the most viable flatwoods salamander populations (K. Enge, Florida Game and Fresh Water Fish Commission, pers. comm. 1997). Permits are required for commercial collecting; however, collection regulations are difficult to monitor and enforce. Flatwoods salamanders concentrate for breeding

and reproduction around breeding ponds, where they are most vulnerable to collecting. Publication of specific localities of breeding ponds would be required in the critical habitat designation process in order to obtain the notification benefit provided by such designation. The publication of breeding pond sites would increase the flatwoods salamander's level of vulnerability to illegal collecting.

Based on the above analysis, we conclude that critical habitat designation would provide little additional benefit for the flatwoods salamander, beyond that which would result from listing under the Act. We also conclude that an increased level of vulnerability to collecting would offset any potential benefit from such a designation.

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 activities. Recognition through listing results in public awareness and conservation actions by Federal, State, and local agencies, private organizations, 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. The protection required of Federal agencies and the prohibitions against taking and harm 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 listed as endangered or threatened and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) requires Federal agencies to confer informally with us 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 subsequently listed, 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 the species or 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 us.

The flatwoods salamander occurs on Federal lands administered by the

Department of Defense, Fish and Wildlife Service, and U.S. Forest Service. These land management agencies would be required to evaluate the potential adverse impacts to the flatwoods salamander from their activities. Federal activities that could affect the flatwoods salamander through destruction or modification of suitable habitat include, but are not limited to, forest management, military operations, and road construction. Other Federal agencies that may be involved in authorizing, funding, or permitting activities that may affect the flatwoods salamander include the Army Corps of Engineers, due to their review of dredge and fill of isolated wetlands under section 404 of the Clean Water Act, nationwide permit 26; the Federal Energy Regulatory Commission, due to their oversight of gas pipeline and power line rights-of-way; and the Federal Highway Administration, when Federal funds are involved in road construction. We have resolved nearly all section 7 consultations to protect the species and meet the project objectives.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all threatened wildlife. The prohibitions, codified at 50 CFR 17.31 for threatened wildlife, in part, make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these), import, export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving threatened wildlife species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.32 for threatened species. You may obtain permits for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. For threatened species, you may also obtain permits for zoological exhibition, educational purposes, or special purposes consistent with the purposes of the Act.

It is our policy, published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify, to the maximum extent practicable at the time a species

is listed, those activities that are or are not likely to constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effects of the listing on proposed and ongoing activities within a species' range. We believe that, based upon the best available information, the following actions are not likely to result in a violation of section 9, provided these activities are carried out in accordance with existing regulations and permit requirements:

(1) Possession of legally acquired flatwoods salamanders;

(2) Lawful hunting activities;

(3) Lawful burning of habitat where the flatwoods salamander is known to occur, including winter burning;

(4) Federally approved projects that involve activities such as discharge of fill material, draining, ditching, tiling, bedding, diversion or alteration of surface or ground water flow into or out of a wetland (i.e., due to roads, impoundments, discharge pipes, etc.), when you conduct the activity in accordance with any reasonable and prudent measures given by the Service in accordance with section 7 of the Act;

(5) Conversion of pine flatwoods habitat where the flatwoods salamander does not occur;

(6) Timber harvesting in pine flatwoods habitat within a 450-m (1,476-ft) radius buffer zone surrounding a known flatwoods salamander breeding pond, in accordance with the following guidelines:

(a) Use selective harvest, only during dry periods and at a minimum of 10-year intervals, within an inner primary zone extending 164 m (538 ft) out from the edge of the breeding pond. Maintain a basal area of 4.2 to 4.7 square meters (sq m) per ha (45 to 50 square feet (sq ft) per ac) in the primary zone.

(b) Use a mix of clear-cutting and selective harvest, only during dry periods and at a minimum of 10-year intervals, in an outer secondary zone extending from 164 m (538 ft) to 450 m (1,476 ft) out from the edge of the breeding pond. Clear-cut up to 25 percent of this secondary zone at any given time, as long as you maintain 75 percent of the secondary zone in pine flatwoods habitat at a basal area of 4.2 to 4.7 sq m per ha (45 to 50 sq ft per ac). Do not separate the primary and secondary zone from each other by cleared or inappropriate habitat (e.g., non-pine flatwoods habitat such as agriculture, urban development or other forest types).

(c) Minimize skid trails and their effects through the use of prescription planning and techniques such as pallets

and bridges. Locate skid trails parallel to, rather than perpendicular to, the wetland edge to reduce alterations in wetland hydrology. Locate all log landings outside the primary and secondary zones.

(d) Keep soil disturbance to a minimum. Do not conduct intensive mechanical site preparation (i.e., root-raking, discing, stumping, bedding) or any other actions that cause significant soil disturbance.

(e) Prescribed fire should be the preferred method for site preparation and control of woody vegetation. Limit herbicide use to manual application, following BMPs, when fire cannot be employed.

(7) Timber harvesting (including clear-cutting) in pine flatwoods habitat where the flatwoods salamander does not occur or outside the 450-m (1,476-ft) buffer zone described above; and

(8) Bait harvesting for crayfish in ephemeral ponds.

We believe the following activities would be likely to result in a violation of section 9; however, possible violations are not limited to these actions alone:

(1) Unauthorized collecting, handling, or harassing of individual flatwoods salamanders;

(2) Possessing, selling, transporting, or shipping illegally taken flatwoods salamanders;

(3) Unauthorized destruction or alteration of wetlands used as breeding sites by flatwoods salamanders. These actions would include discharge of fill material, draining, ditching, tiling, bedding, clear-cutting within the wetland, diversion or alteration of surface or ground water flow into or out of a wetland (i.e., due to roads, impoundments, discharge pipes, etc.), and operation of any vehicles within the wetland;

(4) Discharge or dumping of toxic chemicals, silt, or other pollutants (i.e., sewage, oil, and gasoline) into isolated wetlands or upland habitats supporting the species; and

(5) Unlawful destruction or alteration of suitable pine flatwoods habitat within a 450-m (1,476-ft) radius surrounding a known flatwoods salamander breeding pond. These actions would include, but are not limited to, conversion of habitat to agricultural or urban use, or ditching and draining a site.

(6) Use of pesticides or herbicides in violation of label restrictions.

We will review other activities not identified above on a case-by-case basis to determine whether they may be likely to result in a violation of section 9 of the Act. We do not consider these lists to be

exhaustive and provide them as information to the public.

You should direct questions regarding whether specific activities may constitute a future violation of section 9 to the Field Supervisor of the Service's Jackson Field Office (see **ADDRESSES** section). You may request copies of the regulations regarding listed wildlife from and address questions about prohibitions and permits to the U.S. Fish and Wildlife Service, 1875 Century Blvd., Suite 200, Atlanta, Georgia 30345, or telephone 404/679-7313; facsimile 404/679-7081.

Section 10(a)(1)(B) authorizes us to issue permits for the taking of listed species incidental to otherwise lawful activities such as agriculture, forestry, and urban development. A habitat conservation plan (HCP) identifying conservation measures that the permittee agrees to implement to conserve the species, is a requirement to obtaining this permit. A key element of our review of a HCP is a determination of the plan's effect upon the long-term conservation of the species. We would approve a HCP and issue a section 10(a)(1)(B) permit if the plan provides for minimization and mitigation of the impacts of the taking and for not appreciably reducing the likelihood of the survival and recovery of that species in the wild.

National Environmental Policy Act

We have determined that we do not need to prepare an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, in connection with regulations adopted pursuant to section 4(a) of the Act. A notice outlining our reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

Paperwork Reduction Act

This rule does not contain any new collections of information other than those already approved under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*, and assigned Office of Management and Budget clearance number 1018-0094. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information, unless it displays a currently valid control number. For additional information concerning permit and associated requirements for threatened species, see 50 CFR 17.32.

References Cited

You may request a complete list of all references cited herein, as well as others, from the Jackson Field Office (see **ADDRESSES** section).

Author

The primary author of this final rule is Linda V. LaClaire, Jackson Field Office (see **ADDRESSES** section) (601/965-4900, ext. 26).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as follows:

PART 17—[AMENDED]

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

Authority: 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500, unless otherwise noted.

2. Amend section 17.11(h) by adding the following, in alphabetical order under AMPHIBIANS, to the List of Endangered and Threatened Wildlife:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
* AMPHIBIANS	*	*	*	*	*		*
* Salamander, flatwoods.	* <i>Ambystoma cingulatum</i> .	* U.S.A. (AL, FL,GA,SC).	* Entire	* T	* 658	* NA	* NA
*	*	*	*	*	*		*

Dated: March 18, 1999.

Jamie Rappaport Clark,

Director, Fish and Wildlife Service.

[FR Doc. 99-7942 Filed 3-31-99; 8:45 am]

BILLING CODE 4310-55-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 648

[Docket No. 990324080-9080-01; I.D. 031599D]

RIN 0648-AM10

Fisheries of the Northeastern United States; Northeast Multispecies Fishery; Framework Adjustment 28

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS issues this final rule to implement measures contained in Framework 28 of the Northeast Multispecies Fishery Management Plan (FMP). This final rule allows the use, at specified times, of gillnets in areas otherwise closed to gillnet gear, provided they are equipped with pingers; removes the pinger specifications currently contained in the regulations and references the pinger specifications found in the Harbor Porpoise Take Reduction Plan (HPTRP); extends the Cape Cod South and Massachusetts Bay Closure Areas (March 1-March 30) to December 1-May 31; modifies the Mid-Coast Closure