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**SUPPLEMENTARY INFORMATION:** For additional information, please see the immediate final rule published in the "Rules and Regulations" section of this **Federal Register**.

Dated: April 3, 2006.

**A. Stanley Meiburg,**

*Deputy Regional Administrator, Region 4.*

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## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### 50 CFR Part 17

#### **Endangered and Threatened Wildlife and Plants: 90-Day Finding on a Petition To List the Siskiyou Mountains Salamander and Scott Bar Salamander as Threatened or Endangered**

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

**ACTION:** Notice of 90-day petition finding.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), announce a 90-day finding on a petition to list the Siskiyou Mountains salamander (*Plethodon stormi*) and Scott Bar salamander (*Plethodon asupak*) as threatened or endangered, under the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). We find that the petition and additional information in our files do not present substantial scientific or commercial information indicating that listing these species may be warranted. We will not be initiating a status review in response to this petition. We ask the public to submit to us any new information that becomes available concerning the status of, or threats to these species.

**DATES:** The finding announced in this document was made on April 17, 2006. You may submit new information concerning these species for our consideration at any time.

**ADDRESSES:** The complete file for this finding is available for public inspection, by appointment, during normal business hours at the Yreka Fish and Wildlife Office, U.S. Fish and Wildlife Service, 1829 S. Oregon Street, Yreka, California 96097. Submit new information, materials, comments, or questions concerning these species to us at the address above.

**FOR FURTHER INFORMATION CONTACT:** Phil Detrich, Field Supervisor, Yreka Fish

and Wildlife Office (see **ADDRESSES**), or at (530) 842-5763.

#### **SUPPLEMENTARY INFORMATION:**

##### **Background**

Section 4(b)(3)(A) of the Act requires that the Service make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information indicating that the petitioned action may be warranted. This finding is based on information contained in the petition and information otherwise available in our files at the time we make the finding. To the maximum extent practicable, we are to make this finding within 90 days of our receipt of the petition, and publish our notice of the finding promptly in the **Federal Register**.

In making this finding, we relied on information provided by the petitioners and otherwise available in our files at the time of the petition review. We also had access to a Geographic Information System database of all known Siskiyou Mountain salamander and Scott Bar salamander sites, based on data obtained from researchers, the State of California, the United States Forest Service, and private land managers. We evaluated this information in accordance with 50 CFR 424.14(b). The process of making a 90-day finding under section 4(b)(3)(A) of the Act and section 424.14(b) of our regulations is based on a determination of whether the information in the petition meets the "substantial scientific or commercial information" threshold.

Our standard for substantial scientific or commercial information within the Code of Federal Regulations (CFR) with regard to a 90-day petition finding is "that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted" (50 CFR 424.14(b)). If we find that substantial scientific or commercial information was presented, we are required to promptly commence a status review of the species.

On June 18, 2004, we received a petition dated June 16, 2004 from the Center for Biological Diversity, Klamath-Siskiyou Wildlands Center, and Noah Greenwald, to list the Siskiyou Mountains salamander (*Plethodon stormi*) as a threatened or endangered species on behalf of themselves and five other organizations. Since the time of the petition, Mead *et al.* (2005) recognized the Scott Bar salamander (*Plethodon asupak*) as a species separate from the Siskiyou Mountains salamander. In their petition, the petitioners requested that the Scott Bar salamander also be considered for

listing if the Siskiyou Mountains salamander and the Scott Bar salamander were determined to be separate species. Given the recent recognition of these as separate taxa, we acknowledge that some may question the validity of these species. However, elucidating these taxonomic questions is not the purpose of this finding. The purpose of this finding is to determine whether or not the petition presented substantial information regarding the status of these species within the context of the ESA. The petitioners also requested designation of critical habitat for these species concurrent with their listing. The petition clearly identified itself as such and included the requisite identification information for the petitioners, as required in 50 CFR 424.14(a). In a July 19, 2004 letter to the petitioners, we responded that we reviewed the petition for both species and determined that an emergency listing was not warranted, and that because of inadequate funds for listing and critical habitat designation, we would not be able to otherwise address the petition to list the Siskiyou Mountains salamander and Scott Bar salamander at that time.

On June 23, 2005, we received a 60-day notice of intent to sue and on August 23, 2005, the Center for Biological Diversity and four other groups filed a Complaint for Declaratory and Injunctive Relief in Federal District Court for the District of Oregon (*Center for Biological Diversity, et al. v. Norton et al.*, No. 3:05-CV-1311-BR), challenging our failure to issue a 90-day finding on the petition to list the Siskiyou Mountains salamander and Scott Bar salamander. On December 28, 2005, we reached an agreement with the plaintiffs to complete the 90-day finding by April 15, 2006, and if substantial, to complete the 12-month finding by January 15, 2007.

##### **Species Information**

For the purpose of this finding, the Service is evaluating the Siskiyou Mountains salamander and Scott Bar salamander separately. However, we recognize that all research on the ecology of these species was conducted prior to Mead *et al.*'s (2005) recognition of the Scott Bar salamander as a separate species. To date, information specific to the Scott Bar salamander is limited to its distribution and range. Both species are members of the Family Plethodontidae, the lungless salamanders, and as such their survival is dependent upon similar ecological requirements. The geographic ranges of the Siskiyou Mountains salamander and Scott Bar salamander are contiguous, occur over a relatively

small area (approximately 405,000 acres (164,000 ha)), and have similar environmental conditions. Additionally, information in our files suggests that habitat associations of these species are generally the same, although a rigorous study comparing their habitat requirements has not been conducted. The most significant difference between these species is their range; the range of the Siskiyou Mountains salamander is approximately five times larger than that of the Scott Bar salamander. Therefore, for the purpose of this finding, the Service applied the current literature describing the biological characteristics and ecology of the Siskiyou Mountains salamander to both species. Further, we recognized both entities as separate species consistent with the petition under review while acknowledging that taxonomic questions may exist. It is not the purpose of this finding to resolve such questions.

### Description and Taxonomy

Like others in the genus *Plethodontidae*, the Siskiyou Mountains salamander and Scott Bar salamander are completely terrestrial, medium-sized, slender-bodied salamanders with short limbs and a dorsal stripe. Both species are found in or near talus (loose surface rock) and fissured rock outcrops where moisture and humidity are high enough to allow respiration through their skin (Nussbaum *et al.* 1983). Both species are endemic to the Klamath-Siskiyou Mountains of southern Oregon and northern California.

The Siskiyou Mountains salamander was described in 1965 (Highton and Brame 1965) and is characterized by a modal number of 17 costal grooves (vertical creases along the side of the body) and 4 to 5.5 intercostal folds (folds of skin between the costal grooves) between the toes of adpressed limbs (limbs firmly pressed against the sides of the body) (Nussbaum *et al.* 1983; Leonard *et al.* 1993). Adults have a light- to purplish-brown dorsum and the body is sprinkled with a moderate to dense array of white to yellow flecks, concentrated on the sides and limbs and away from the light-brown dorsal stripe. Juveniles are black and have an olive-tan dorsal stripe that extends onto the tail.

Recent genetic analyses recognize the Siskiyou Mountains salamander as a distinct species from the Del Norte salamander (*Plethodon elongatus*) and the Scott Bar salamander (Mead *et al.* 2002, 2005; Mahoney 2004; Bury and Welsh 2005). Previously, observations of clinal variation in color and morphometric traits from coastal

populations of Del Norte salamanders along the Klamath River to Siskiyou Mountains salamander populations in the Seiad Valley led Bury (1973) to propose possible intergradation between these two species, and Stebbins (1985, 2003) to demote the Siskiyou Mountains salamander to a subspecies of Del Norte salamander.

Mead *et al.* (2005) described *Plethodon asupak*, the Scott Bar salamander, as a new species based on analysis of molecular (mitochondrial DNA) and morphological data from *Plethodon* populations near the confluence of the Klamath and Scott Rivers in Siskiyou County, California (Mahoney 2004; Mead *et al.* 2002, 2005). Molecular analysis shows the Scott Bar salamander to be the ancestral lineage from which the Del Norte salamander and Siskiyou Mountains salamander were derived (Mahoney 2004; Mead *et al.* 2002, 2005). For the purpose of this finding, the Service is evaluating the Scott Bar salamander as a species separate from the Siskiyou Mountains salamander. We recognize, however, that genetic research on these salamanders is ongoing, and the final species' designations may be subject to the outcome of ongoing work. This additional work may result in questions regarding the taxonomic validity of these species and we acknowledge the potential for those questions to be raised in the future. However, it is not appropriate to elucidate these potential questions in this action.

The Scott Bar salamander is more robust and has a wider head and longer limbs than either of its two most closely related sister species, the Del Norte salamander and Siskiyou Mountains salamander (Mead *et al.* 2005). It has fewer intercostal folds between adpressed limbs (2.5 to 3.5) than either the Del Norte salamander (5 to 6) or the Siskiyou Mountains salamander (4 to 5) and the modal number of costal grooves (17) is one less than in the Del Norte salamander (18). The Scott Bar salamander has a longer body relative to its tail length and longer forelimbs and hindlimbs than the Siskiyou Mountains salamander or Del Norte salamander. The coloration of the Scott Bar salamander is similar to that of the Siskiyou Mountains salamander and is described in Mead *et al.* (2005). Despite the morphological differences described in Mead *et al.* (2005), the two species are very difficult to distinguish in the field.

### Habitat

Siskiyou Mountains salamanders and Scott Bar salamanders are found on forested slopes where rocky soils and

talus outcrops occur. Occupied habitat for the Siskiyou Mountains salamander can range from small isolated rock outcrops to entire hillsides (Clayton *et al.* 2004). Occasionally these salamanders can be found under other types of cover such as bark, limbs, or logs, but only during wet weather when moisture is high and only if there are talus outcrops nearby (Nussbaum *et al.* 1983; Nussbaum 1974). Nussbaum (1974) characterized optimal habitat for the Siskiyou Mountains salamander as stabilized talus in old-growth forest stands on north-facing slopes. However, more recently populations of both species have been found in rock outcrops in all forest age classes and on all slope aspects (Clayton *et al.* 2004; USDI 2005 *in litt.*), as well as in managed stands (CDFG 2005). Siskiyou Mountains salamanders have been collected in the spring during the daytime at soil temperatures ranging from 38 to 52.3 degrees Fahrenheit (3.5 to 11.3 degrees Celsius) and at depths ranging from 0 to 18.0 inches (0 to 45.7 centimeters) (Nussbaum *et al.* 1983; Nussbaum 1974).

### Range and Distribution

The Siskiyou Mountains salamander's range encompasses approximately 337,037 acres (ac) (136,500 hectares (ha)) in three counties (Jackson, Josephine, and Siskiyou) of southwestern Oregon and northern California (Clayton and Nauman 2005a). More specifically, this species has been detected in the Applegate River drainage of southern Oregon south to the Klamath River watershed of northern California. In California, recent genetic analyses indicate the species' range is bounded to the west by the Indian Creek drainage and to the east by the Horse Creek drainage (see DeGross 2004; Mahoney 2004; Mead *et al.* 2005; Mead 2006). It is known from sites ranging from 488 meters (1,600 feet) (Nussbaum *et al.* 1983) to approximately 1,800 meters (6,000 feet) in elevation (Clayton *et al.* 1999). Approximately 90 percent of the Siskiyou Mountains salamander's range occurs on Federal lands managed under the Northwest Forest Plan (NWFP) (USDA, USDI 1994). Within the NWFP area, 36 percent of the salamander's range occurs in reserves (Late-Successional Reserves, Administratively Withdrawn Areas, and Congressionally Reserved Areas) where timber harvest and other ground-disturbing activities are severely restricted, 10 percent is within Matrix lands generally available for timber harvest, and 44 percent occurs in Adaptive Management Areas (AMA) where habitat management guidelines are flexible and some timber

harvest is expected to occur. The remaining 10 percent of the species' range occurs on private lands.

To date, approximately 200 Siskiyou Mountains salamander sites have been located (Clayton and Nauman 2005a). This number represents an unknown proportion of the total population, because surveys have not been conducted over the species' entire range. These localities occur primarily on Federal lands and are distributed across several NWFP land use allocations (Clayton *et al.* 2004). The USDA, USDI Species Review Panel (2002) reported that approximately 23 percent of known sites occur on reserve lands (Late-Successional Reserves and Congressionally Withdrawn Areas) (USDA, USDI 1994). The remaining sites occur on Adaptive Management Areas, Matrix, and private lands.

The Scott Bar salamander is found only in Siskiyou County, California, from just east of Seiad Valley to Scott Bar Mountain (Clayton and Nauman 2005b). The species' range extends north and south of the Klamath River and east and west of the Scott River and encompasses approximately 68,438 ac (27,717 ha). Approximately 82 percent of the Scott Bar salamander's range occurs on Federal lands: 58 percent in reserves (Late-Successional Reserves) and 24 percent in Matrix lands (USDA, USDI 1994). The remaining 18 percent of the species' range occurs on private lands.

Clayton and Nauman (2005b) reported that fewer than ten localities are currently known for the Scott Bar salamander, although other locations are suspected. Based on our internal review of recent genetic analyses (Mahoney 2004; Mahoney 2005; Mead *et al.* 2005; Mead 2006), 17 Scott Bar salamander localities have now been verified. Within the presumed range of the Scott Bar salamander, numerous historical salamander detections have been assigned to the Siskiyou Mountains salamander. Because the two species tend not to overlap (Mead 2006), it is reasonable to conclude that all salamander detections within what is now known to be the range of the Scott Bar salamander are Scott Bar salamanders. Thus, information in our files suggests that within the range of the Scott Bar salamander there are roughly twenty known salamander localities that are likely occupied by Scott Bar salamanders and are additional to the 17 noted above (USDI *in litt.* 2006). To date, systematic surveys have not been conducted throughout this species' range; however, additional sites may be located in the future.

The verified localities of the Scott Bar salamander are distributed across several watersheds that encompass the majority of the species' known range. Of these localities, 82 percent occur on Federal lands: 35 percent in reserves (Late-Successional Reserves) and 47 percent in Matrix lands (USDA, USDI 1994). The remaining 18 percent of the verified localities occur on private lands. Although the sample of known localities was not collected systematically, this distribution suggests that the species may be well distributed within its range.

Evaluation of the range and potential population size for the Siskiyou Mountains salamander and Scott Bar salamander is strongly influenced by the amount and distribution of potentially suitable habitat. The USDA, USDI Species Review Panel (2001) evaluated results of project surveys conducted in the northern portion of the Siskiyou Mountains salamander's range, and estimated that 3 to 14 percent of the extent surveyed provides potentially suitable habitat. In a similar evaluation, Timber Products Company estimated that approximately 18 percent of their surveyed lands within the range of the Scott Bar salamander was composed of suitable talus habitat (S. Farber pers. comm. 2006). The information from both surveys suggests that suitable habitat for these species is patchy within these species' ranges.

#### Threats Analysis

Section 4 of the Act and its implementing regulations (50 CFR 424) set forth the procedures for adding species to the Federal list of endangered and threatened species. 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) of the Act: (A) Present or threatened destruction, modification, or curtailment of habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. In making this finding, we evaluated whether threats to the Siskiyou Mountains salamander and Scott Bar salamander as presented in the petition and other information available to us may pose a concern with respect to the species' survival such that listing under the Act may be warranted. Our evaluation of these threats, based on information provided in the petition and available in our files, is presented below.

#### *A. Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range*

The petition claims that logging and wildfire pose the primary threats to Siskiyou Mountains salamander and Scott Bar salamander habitat and populations by altering habitat structures that influence the microclimatic conditions required by both species. The petition states that logging and wildfire cause increases in surface temperatures and decreases in relative humidity and soil moisture by removing forest cover. It also states that logging has the additional effect of compacting and realigning talus substrates. The petition states that it is likely a substantial, yet unquantified, amount of habitat has already been lost due to logging activities.

According to the petition, the effects of logging and wildfire on Siskiyou Mountains and Scott Bar salamanders are based on a sequence of relationships: the unique physiology and behavior of these species, their dependence on moist surface conditions in order to forage and reproduce, reduction of the occurrence of favorable surface conditions following loss of forest cover, and loss of viability of salamander populations inhabiting the resulting unfavorable conditions. Based on these assertions, the petition concludes that the rate and extent of timber harvest and fires will likely cause the two species to be threatened or endangered due to habitat loss in the foreseeable future.

The petition and information in our files describe the physiological and behavioral traits of Siskiyou Mountains salamanders and Scott Bar salamanders that link them to habitats that provide moist conditions. Both species are lungless salamanders that require moisture in order to respire through their skin and to avoid desiccation (Nussbaum *et al.* 1983). These traits act to limit the time during which the species can be active at the surface where foraging takes place (Nussbaum *et al.* 1983; Feder 1983). In the warm, dry environment characteristic of the eastern Klamath-Siskiyou Mountains, surface conditions favorable for activity by these salamanders is limited to relatively brief rainy periods in the spring and fall when soil moisture and relative humidity are high and temperatures moderate (Nussbaum *et al.* 1983; Clayton *et al.* 1999). This limitation is reflected in survey protocols for Siskiyou Mountains salamander, which require that surveys be restricted to periods of relative humidity above 65 percent, air

temperature between 39.2 and 68 Fahrenheit (4 to 20 degrees Celsius), soil temperature between 38.3 and 64.4 degrees Fahrenheit (3.5 to 18 degrees Celsius), and moist soil conditions; outside of these parameters detection rates are low (Clayton *et al.* 1999). During the remainder of the year, these salamanders retreat underground into fissured rock substrates (Nussbaum *et al.* 1983).

Based on the relationships described above, the petition claims that habitat conditions that further limit aboveground activity will result in reduced abundance and viability of Siskiyou Mountains salamander and Scott Bar salamander populations. The petition cites Ollivier *et al.* (2001), who state that shortened periods of surface conditions appropriate for feeding and breeding activities can limit both survivorship and recruitment of these salamanders due to reduced ability to achieve body mass and fat needed for reproduction. Based on physiological and ecological studies of plethodontid salamanders (Feder 1983), and the association of Siskiyou Mountains salamander and Scott Bar salamanders (and the closely related Del Norte salamander in the Klamath province) with mature forested habitats (Nussbaum *et al.* 1983; Ollivier *et al.* 2001; Welsh and Lind 1988; 1991; and 1995), it is reasonable to conclude that individuals living in drier, more open conditions may experience reduced fitness.

The petition cites Chen *et al.* (1993) to support the claim that removing or reducing canopy during logging or other activities can alter stand microclimates, which in turn would result in conditions unsuitable for surface activity by salamanders. Information in our files suggests that microclimatic variables such as soil moisture, fuel moisture, relative humidity, and air temperature are sensitive to changes in canopy, with open-canopied and unforested sites exhibiting drier conditions, reduced humidity, and warmer air and soil temperatures (Chen *et al.* 1995; Chen *et al.* 1999).

The petition states that rigorous pre- and post-logging studies have not been conducted on Siskiyou Mountains salamanders or Scott Bar salamanders. Information in our files also indicates that this type of study has not been conducted on the similar Del Norte salamander in the drier portions of its range. However, the petition cites several studies from across North America (Dupuis *et al.* 1995; deMaynadier and Hunter 1998; Ash 1997; Herbeck and Larsen 1999) and specific to the Pacific Northwest (Bury

and Corn 1988; Corn and Bury 1991; Raphael 1988; Welsh 1990; Welsh and Lind 1988, 1991, and 1995) that describe impacts of logging to other plethodontid salamanders. It is important to note that studies conducted in eastern and mid-western North America and much of the Pacific Northwest (Grialou *et al.* 2000; Bury and Corn 1988; Corn and Bury 1991; Raphael 1988; Welsh 1990; and Welsh and Lind 1988, 1991, and 1995) were conducted in mesic (relatively wet) forest types where environmental constraints (moisture, temperature) on salamander dispersal and survival are presumably less than in the dry eastern Klamath Mountains. In addition, most plethodontid salamander species studied in other areas of North America occupy soil, surface litter, and woody debris in mesic environments, whereas Siskiyou Mountains salamanders and Scott Bar salamanders occupy talus substrates that provide refuge from temperature extremes and dry conditions in xeric (relatively dry) environments. Therefore, inferences drawn from studies of other plethodontid species in mesic environments may be limited in their applicability to Siskiyou Mountains salamander or Scott Bar salamander populations in the dry eastern Klamath Mountains.

Studies from the mid-western and eastern United States (deMaynadier and Hunter 1998; Ash 1997; Herbeck and Larsen 1999) and western Canada (Dupuis *et al.* 1995) indicate that clear-cutting can have significant short-term impacts to plethodontid salamander abundance, and that second-growth stands that regenerate following clear-cutting typically do not support the same level of abundance as do older forests. Dupuis *et al.* (1995), Ash (1997), and Herbeck and Larsen (1999) reported that plethodontid salamanders were frequently absent from 2 to 5-year-old clear-cut forests. All of the studies that examined relative abundance of plethodontid salamanders in different forest age classes (deMaynadier and Hunter 1998; Herbeck and Larsen 1999; Dupuis *et al.* 1995) found that second-growth stands supported salamanders, albeit at significantly lesser abundance than older forests. However, the impact of clear-cutting on salamanders may be temporary, as one study (Ash 1997) showed that salamanders returned to clear-cut area 4 to 6 years after cutting, and their numbers increased rapidly. Results from linear regressions estimated that salamander numbers on clear-cut plots would equal or exceed

numbers on forested plots by 20 to 24 years after cutting (Ash 1997).

Studies of more closely related plethodontid salamanders in the Pacific Northwest (Corn and Bury 1991; Raphael 1988; Welsh 1990; and Welsh and Lind 1988, 1991, and 1995) found the abundance of plethodontid salamanders to be greater in older versus younger forests, and most of these studies found that difference to be significant. However, salamanders were still present in harvested areas. Raphael (1988) reported that while Del Norte salamanders were 2 to 3 times more abundant in adjacent old-growth forest, clear-cut areas still contained the species. Additional information in our files (Grialou *et al.* 2000) also suggests that western red-backed salamanders (*Plethodon vehiculum*) occupy recent 2 to 4 year-old clear-cut areas, although at a significantly lesser abundance than adjacent older forests. H. Welsh and D. Ashton (*in litt.* 2004) obtained similar results for Del Norte salamanders on the Six Rivers National Forest, where salamander abundance showed a marked decline following clear-cutting, but remained relatively stable in a lightly harvested stand. However, studies are not consistent with respect to abundance on recently clear-cut sites. Bury and Corn (1988) reported plethodontid salamanders to be absent in their two clear-cut sites, but their results were equivocal because detection rates of plethodontid salamanders were very low in all of the habitats studied. In contrast to the above studies, Corn and Bury (1991) found abundance of western red-backed salamanders was not significantly different between clear-cut areas less than 10 years old and old-growth forest.

To our knowledge, few studies exist in the peer-reviewed literature comparing the demographics of plethodontid salamander populations in clear-cut areas and adjacent forest. Grialou *et al.* (2000) studied the abundance and demographics of salamanders, including two plethodontid species, in mesic forests in southwestern Washington. In the year following clear-cut harvesting, body sizes of western red-backed salamanders were smaller (subadults and juveniles), but attained normal size distribution by the second-year post harvest. Gravid females were captured on clear-cut plots before and after harvest. Knapp *et al.* (2003) used a randomized, replicated design to quantify plethodontid salamander populations on harvested timberlands of the Appalachian Mountains in Virginia and West Virginia. While salamander abundance was less on clear-cut areas versus

control areas, there were no differences between cut and uncut treatments in the proportion of gravid females or in the average number of eggs in gravid females. Moreover, there were no differences between cut and uncut treatments in the proportion of the sample that was juvenile, except in one plethodontid species, which had a higher proportion of juveniles in uncut treatments.

Because most of the aforementioned studies have been conducted on other plethodontid species in mesic environments, the Service believes that our evaluation should focus primarily on information collected from Siskiyou Mountains salamander and Scott Bar salamander populations. The petition claims that a study of habitat associations of Siskiyou Mountains salamander by Ollivier *et al.* (2001) demonstrates that the species is threatened by logging. Ollivier *et al.* (2001) conducted presence/absence surveys for salamanders at 239 random locations within the range of Siskiyou Mountains salamander (some samples were within the range of the Scott Bar salamander), and concluded that the species was strongly associated with characteristics of mature forests such as closed canopies, large tree diameters, and a mossy ground cover layer. Based on this conclusion, the petition infers that removal of forest cover would result in habitat conditions unsuitable for the salamanders. While the study design employed by Ollivier *et al.* (2001) did not compare salamander abundance pre- and post-harvest, their sample contained 42 precanopy plots (0-to-30-year-old clearcuts). Subsequent to the study by Ollivier *et al.* (2001), State and private biologists conducted numerous surveys and detected Siskiyou Mountains salamanders and Scott Bar salamanders in previously logged sites (Farber *et al.* 2001; CDFG 2005). These surveys followed no sampling design and cannot be used to infer a lack of impacts caused by logging; however, they do demonstrate that salamander populations persist at sites that have been logged.

After reviewing data collected by Ollivier *et al.* (2001) and sampling results obtained by the California Department of Fish and Game (CDFG), H. Welsh and D. Ashton (*in litt.* 2004) concluded that the viability of Siskiyou Mountains salamander populations is compromised following clear-cutting. They based this conclusion on the high proportion (64 percent) of juvenile and subadult animals in the sample obtained by CDFG in non-forested habitats, and speculated that this was an indication of a 'sink' population of dispersing

individuals and low levels of reproduction. Without further research, the effects of forest canopy removal on the abundance and demographics of Siskiyou Mountains salamander and Scott Bar salamander populations following logging will remain poorly understood. Two studies examining this question are currently in progress: One involving the Service, the Redwood Sciences Laboratory, and Humboldt State University, and one being conducted by Timber Products Company.

The petition also states that gaps created in the species' range by logging could compromise the species' viability. The petition claims that the biology of the species, narrow habitat niche, naturally fragmented habitat, and patchy distribution limit the species' ability to recover from disturbances. The petition cites Blaustein *et al.* (1995) to support their claim that when local populations of Siskiyou Mountains salamander are extirpated, there is little chance that the habitat will be recolonized. The biology of the Siskiyou Mountains salamander and the Scott Bar salamander may limit their ability to recolonize vacant sites; however, neither the petition, nor our files, provide information supporting the premise that logging creates gaps in plethodontid salamander distribution by extirpating species from a site.

The petition also states that other actions, including tractor yarding, road construction, mining, and recreational development, have resulted in, and will continue to result in, degradation, loss, or fragmentation of Siskiyou Mountains salamander habitat. The petition cites Welsh and Ollivier (1995) as suggesting that tractor yarding may impact Siskiyou Mountains salamander habitat by compacting, breaking, or realigning talus. Although it is reasonable to conclude that tractor yarding may disturb talus substrates, field studies have not demonstrated how this impacts salamander populations. The petition also cites deMaynadier and Hunter (2000) as indicating that plethodontid salamanders are sensitive to population fragmentation by logging roads. Results of that study suggest that logging roads may significantly inhibit movement and local abundance of plethodontid salamanders. Additional information in our files (Marsh *et al.* 2005) suggests that forest roads act as partial barriers to salamander movement. Road densities within much of the ranges of the Siskiyou Mountains salamander and Scott Bar salamander are documented to be high (USDA 1999); and may act to reduce dispersal and increase the degree of isolation among salamander

populations. This in turn may lead to reduced gene flow and reduced long-term persistence of small, isolated populations (Marsh *et al.* 2005). The extent to which this factor may be influencing populations of Siskiyou Mountains salamanders and Scott Bar salamanders is currently unknown.

Although the amount of habitat impacted by logging could not be quantified, the petition contends that substantial habitat loss has likely occurred. To support this claim, the petition cites the USDA, USDI Species Review Panel (2001), which stated that "cumulative effects from past timber harvest have impacted populations on Federal lands" and "from 1980 to 1990, 10 percent of habitat on the Applegate Ranger District was clearcut." However, the rate and extent of timber harvest has declined dramatically on Federal lands within the Northwest Forest Plan area during the past 30 years (USDA, USDI 2005), particularly on the Klamath National Forest, which comprises roughly 50 percent of the Siskiyou Mountain salamander's range and 80 percent of the Scott Bar salamander's range. (USDA 2006). During the six-year period from 2000 to 2005, the Klamath National Forest sold and removed an average of 15.9 million board feet of timber annually; compared with 187.8 million board feet/year during 1985 to 1990 (inclusive), and 238.2 million board feet/year from 1979 to 1984 (USDA 2006). The declining trend in timber harvest reduces the likelihood that a high proportion of the salamanders' populations will be impacted by logging.

Additional information in our files suggests that extensive logging has occurred and is likely to continue on private lands, which comprise 10 percent and 18 percent of the ranges of Siskiyou Mountains salamander and Scott Bar salamander, respectively. For example, Timber Products Company has informed the Service of its intent to clear-cut harvest at several occupied Scott Bar salamander sites in 2006 as part of a study of the species' response to timber harvest (S. Farber, pers. comm. 2006; S. Farber, *in litt.* 2006). While the Service agrees that timber harvesting has the potential to reduce habitat quality for the Siskiyou Mountains salamander and Scott Bar salamander, Forest Service reports (USDA, USDI 2005; USDA 2006) suggest that the rate and magnitude of harvest on the majority of the species' ranges is not sufficient to cause them to be threatened or endangered in the foreseeable future.

The petition claims that fire suppression has led to an increase in fuel loading, resulting in a change from

low-to high-intensity fire regimes in many forest stands within the ranges of the Siskiyou Mountains salamander and Scott Bar salamander, and that the risk of stand-replacing fire has increased due to forest management practices which remove the largest, most fire resistant trees and create young, highly combustible plantations. The petition claims that although the response of these salamanders to fire has not been well studied, fire has the potential to impact populations by removing or reducing forest canopy cover. Published studies (Taylor and Skinner 1998; Agee 1993) and Forest Service reports (USDA 1999) clearly document that increased fuel loading and forest stand density have increased the potential for high-intensity wildfire events within the range of the Siskiyou Mountains salamander and Scott Bar salamander. These high-intensity fires were much less frequent in the historical fire regime with which these salamanders evolved. High-intensity wildfire events, by definition, remove or significantly reduce forest cover; consume moss, duff, and forest litter; and may sterilize surface soil layers. The impacts of such events on salamander habitat and populations are likely more severe than those of clear-cutting, but have not been directly evaluated. Recent large fires within the Klamath Province, combined with fire behavior modeling conducted by the Forest Service, suggest a high probability of moderate- to high-intensity wildfires within the range of the Siskiyou Mountains salamander and Scott Bar salamander. However, fire modeling also suggests that the level of tree mortality would be highly variable within the range of these species (USDA 1999), resulting in a mosaic pattern of habitat effects. Additionally, the extent to which high-intensity fire effects would occur within habitats occupied by these salamanders is currently unknown.

To summarize Factor A, logging, wildfire and other habitat disturbances may impact local abundance and viability of Siskiyou Mountains salamanders and Scott Bar salamanders by altering the microclimate within stands that support these species, fragmenting habitat, or otherwise reducing habitat quality. Although extensive logging has occurred in Siskiyou Mountains salamander and Scott Bar salamander habitat for over one hundred years, the extent of habitat loss has not been quantified. Increased potential for stand-replacing wildfire also places more of the species' habitat at risk. Information in our files (*e.g.*, Farber *et al.* 2001; CDFG 2005) indicates

that both Siskiyou Mountains salamanders and Scott Bar salamanders occur to some extent in clear-cuts, second-growth stands, burned areas, and naturally open habitats, and the demography of populations subjected to timber harvest or fire is poorly known. This evidence suggests that while timber harvest and wildfire may reduce habitat quality for Siskiyou Mountains salamanders and Scott Bar salamanders, they do not result in the extirpation of populations. Moreover, the rate and extent of timber harvest has declined dramatically on Federal lands within the Northwest Forest Plan area, particularly the salamanders' ranges on the Klamath National Forest, during the past 30 years (USDA, USDI 2005; USDA 2006). Based on current Forest Service policies, we anticipate that the rate of timber harvest will remain at roughly present levels in the foreseeable future. Although it is reasonable to assume that high-intensity wildfire may have a negative impact on salamander habitat and populations, we currently have no information and the petition provided no information to support a determination that fire is a substantial risk. We therefore find that the petition and other information in our files do not present substantial information that the continued existence of these species are threatened by the present or threatened destruction, modification, or curtailment of the species' habitat or range in the foreseeable future.

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

The petition and our files did not provide any information pertaining to Factor B. Information in our files indicates that tissue samples have been, and will likely continue to be, collected from individual salamanders in the field. However, methods used to collect genetic material for analysis are not expected to cause harm to the salamanders.

#### *C. Disease or Predation*

Neither the petition nor information in our files present any information pertaining to Factor C.

#### *D. Inadequacy of Existing Regulatory Mechanisms*

*Federal lands:* The petition cites the USDA, USDI Species Review Panel (2001) to demonstrate that approximately 80 percent of the Siskiyou Mountains salamanders' range occurs on Federal lands managed by the Rogue-Siskiyou and Klamath National Forests and the Medford District of the Bureau of Land Management. Thirty-

nine percent of the species' range occurs within protected land designations under the Northwest Forest Plan (NWFP) (USDA, USDI Species Review Panel 2001). Additionally, the petition cites Clayton *et al.* (2002 as cited in USDA, USDI 2004) to demonstrate that less than 10 percent of suspected high-quality habitat occurs in reserves. The petition thus concludes that the majority of the species' ranges and high-quality habitat occurs on Federal lands available for timber harvest and other activities. The petition cites the USDA, USDI Species Review Panel (2001) to suggest that specific protections on non-reserve land allocations will likely be required to ensure persistence of the species.

The petition claims that the Siskiyou Mountains salamander formerly received substantial protection on Federal lands from the Survey and Manage Program (USDA, USDI 1994). The petition claims that this program was abolished with the Record of Decision entitled "To Remove or Modify the Survey and Manage Mitigation Measures Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl" in March 2004 (March 2004 ROD). The Final Supplemental Environmental Impact Statement for the March 2004 ROD addressed potential mitigation, including sensitive species programs, for species affected by the removal of the Survey and Manage Program. However, the petition claims that the sensitive species programs provide substantially less protection by failing to require surveys and making mitigation optional. The petition cites a USDA, USDI (2004) statement that the elimination of the Survey and Manage Program may result in gaps in the Siskiyou Mountains salamander's range.

According to the petition, in the absence of the Survey and Manage Program, management of the Siskiyou Mountains salamander would be governed under/by the standards and guidelines of the NWFP. According to the petition, 78 percent of the known sites north of the Siskiyou Crest occur in the Applegate AMA. Under the NWFP, AMAs were created to "encourage the development and testing of technical and social approaches to achieving desired ecological, economic, and other social objectives," with each AMA having a management plan (USDA, USDI 1994). Because an agency plan for the Applegate AMA has not been produced, and standards and guidelines for activities in AMAs are more flexible than in other land-use allocations, the petition claims that

existing guidelines for the Siskiyou Mountains salamander in the Applegate AMA would result in limited protection for the species. However, the petitioners provided no documentation to suggest that Federal actions in the AMA are having an effect on the salamanders.

The status of the Survey and Manage program is in flux. In January 2006, the United States District Court, Western District of Washington in *Northwest Ecosystem Alliance, et al., v. Mark E. Rey, et al.*, Case 2:04-CV-00844-MJP, ordered the March 2004 ROD set aside for failure to comply with the National Environmental Policy Act. With this, the court reinstated the 2001 Survey and Manage ROD as it stood on March 2004. The Survey and Manage Program is therefore the current regulatory mechanism in place for the United States Forest Service and Bureau of Land Management lands that the Siskiyou Mountains salamander occupies. Under these provisions, all currently known and future sites south of the Siskiyou Crest will be managed to maintain species persistence and surveys will be conducted prior to habitat-disturbing activities. North of the Siskiyou Crest, high-priority sites will be identified and managed to provide a reasonable assurance of species persistence.

The Scott Bar salamander is not specifically addressed by name in the Survey and Manage ROD protections. However, the Klamath National Forest has formally stated that Survey and Manage protections for Siskiyou Mountains salamander also extend to the Scott Bar salamander, since they cannot be easily distinguished in the field (M. Boland, *in litt.* 2006). Thus, protections for the Scott Bar salamander on Federal lands are in place.

According to the court's order, the defendants indicated that they plan to propose a supplement to the 2004 Final Supplemental Environmental Impact Statement to address the deficiencies identified by the court, followed by a new ROD on or before March 30, 2007. It is unknown what protections will be provided the Siskiyou Mountains salamander in future decisions. If existing Federal regulations are modified in the future, the adequacy of these regulations to protect the Siskiyou Mountains salamander and Scott Bar salamander should be evaluated at that time.

#### *State Regulations:*

The State of Oregon provides no regulatory protections for the Siskiyou Mountains salamander on private lands (approximately 10 percent of the species' range). In California, the Siskiyou Mountains salamander is listed

as a threatened species and receives substantial protection pursuant to the California Endangered Species Act (CESA). These protections include pre-project surveys and prohibitions on timber harvest in established buffers around suitable habitat. In 2005, CDFG submitted a petition to the California Fish and Game Commission to delist the Siskiyou Mountains salamander. Because of CDFG's delisting proposal, the petitioners claim that the protections provided by CESA should not be considered to provide firm regulatory protection for the species. The final determination on whether to delist the Siskiyou Mountains salamander is expected to be made at the Fish and Game Commission's January 31, 2007 meeting. If existing State regulations are modified in the future, the adequacy of these regulations to protect the Siskiyou Mountains salamander should be evaluated at that time. Unless and until the Siskiyou Mountains salamander is delisted as a threatened species, it remains protected pursuant to the CESA.

In July 2005, the Scott Bar salamander appeared on the CDFG's Special Animals List (CDFG 2006). The CDFG describes the Scott Bar salamander as a "newly discovered species from what was part of the range of *Plethodon stormi*." Currently, the Scott Bar salamander does not have any special management status (rare, threatened, or endangered species; fully protected species; or species of special concern) in California, and thus receives no special management considerations or additional protections on approximately 18 percent of its range.

Adequate regulatory mechanisms are lacking on approximately 10 percent of the Siskiyou Mountains salamander's range and 18 percent of the Scott Bar salamander's range. However, research suggests that populations of plethodontid salamanders persist following timber harvest. Therefore, the Service believes that the lack of regulatory protections on a limited proportion of the species' ranges does not likely pose a threat to the species in the foreseeable future.

To summarize Factor D, existing Federal regulations currently provide substantial protection for the Siskiyou Mountains salamander and Scott Bar salamander through the Survey and Manage program. Thus, the fact that significant portions of the Siskiyou Mountains salamander and Scott Bar salamander ranges include Federal lands available for timber harvest (Matrix and AMA) does not in itself constitute a threat to the species.

Current California regulations provide substantial protection for the Siskiyou Mountains salamander on private lands. Existing California regulations provide no special management protections for the Scott Bar salamander on private lands. Likewise, Oregon provides no regulatory protections for Siskiyou Mountains salamanders on private lands. However, private lands comprise only 18 percent of the Scott Bar salamanders' range and only 10 percent of the Siskiyou Mountains salamanders' range in Oregon. Thus, substantial protections are provided to both species across the majority of their ranges. Although the Forest Service and Bureau of Land Management have indicated they plan to develop a supplement to their March 2004 ROD addressing deficiencies in that document identified by the court, and the State of California is currently evaluating a petition to delist the Siskiyou Mountains salamander, no decisions regarding these actions have yet been reached that would effect existing regulatory mechanisms. Thus, the Service considers the current Federal and State regulations adequate for both salamander species. If these regulations are modified in the future, the adequacy of these regulations to protect the Siskiyou Mountains salamander and the Scott Bar salamander should be evaluated at that time.

Because Federal and State of California regulations are currently in effect and offer protection for the Siskiyou Mountains salamander and Scott Bar salamander over the majority of the species' ranges, the petition and other information in our files does not present substantial information that these species are threatened at this time by the inadequacy of existing regulatory mechanisms across all or a significant portion of their ranges.

#### *E. Other Natural or Manmade Factors Affecting the Species' Continued Existence*

The petition states that "an increasing consensus has developed that we are and will continue to experience global warming." The petition cites Feder (1983) and Ollivier *et al.* (2001) to propose that the unique physiology and requirement of moist conditions for foraging and breeding activity make the Siskiyou Mountains salamander and Scott Bar salamander particularly sensitive to variations in climate. Thus, the petition suggests that the expected change in climate over time is likely to influence the species distribution and ability to find suitable habitat. The petition also claims that warmer temperatures may shorten the window

in which the species is able to forage and reproduce. According to the petition, warmer temperatures may also negatively affect habitat by increasing the severity and intensity of forest fires, resulting in loss of forest canopy. While providing information on climate change the petition did not provide information beyond speculation regarding the effects of microhabitat changes that may be brought about by regional climate change.

The petition also cites USDA, USDI (2004) to demonstrate that, due to limited habitat and the known existence of only three localities, the Scott Bar salamander is at risk of extinction due to genetic or demographic stochasticity, regardless of management direction. However, information in our files suggests that the number of known localities and existing habitat within the range of the Scott Bar salamander is considerably larger than that considered in USDA, USDI (2004). The existence of 37 currently known sites decreases the potential for extinction caused by stochastic events, although the species' range is still considered small and restricted. Stochastic events pose less of a threat to the Siskiyou Mountains salamander due to the greater number of known localities and relatively larger range.

To summarize factor E, because foraging and breeding activities are dependent upon cool, moist conditions, these salamanders may be susceptible to alterations in microclimate resulting from projected climate change. However, neither the petition nor other information in our files provides anything more than speculation on the type, magnitude, or temporal effects of microhabitat changes that may be brought about by regional climate change. Finally, the petitioners assert that the Scott Bar salamander is at risk because its small, restricted range makes this species vulnerable to extinction as a result of stochastic events. Although the range of the Scott Bar salamander is considered restricted, the number of currently known populations is considerably greater than stated in the petition. Additionally, a considerable amount of suitable habitat capable of

supporting the Scott Bar salamander has yet to be surveyed. Thus, the Service believes that the Scott Bar salamander may be less susceptible to stochastic events than the petition claims. Therefore, we find that the petition does not contain substantial information suggesting that other natural or manmade factors may be a factor that threatens either species.

#### **Finding**

We evaluated each of the five listing factors individually, and because the threats to the Siskiyou Mountains salamander and Scott Bar salamander are not mutually exclusive, we also evaluated the collective effect of these threats. The petition focused primarily on two listing factors: the Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range and the Inadequacy of Existing Regulatory Mechanisms. More specifically, the petition and information in our files suggest that logging and fire pose the most likely threats to Siskiyou Mountains salamander and Scott Bar salamander habitat and populations, because the majority of the species' ranges occur on lands available for timber harvest or lands susceptible to stand-replacing wildfires. Synergistically, timber harvest and fire have the potential to impact extensive amounts of habitat and a large number of discrete populations. The Siskiyou Mountains salamander's numerous distinct localities and occurrence both north and south of the Siskiyou Crest likely increase the resilience of this species to logging and wildfire. Additionally, current Federal and State of California regulations provide substantial protection for the Siskiyou Mountains salamander on both Federal and private lands. Therefore, the Service believes that the Siskiyou Mountains salamander's numerous localities and existing Federal and State of California regulations ameliorate, to some degree, the potential synergistic effects to this species.

Synergistic effects are of greater concern for the Scott Bar salamander. This species has a restricted range and substantially fewer known localities.

Information in our files also indicates that portions of the species' range are at high risk of fire (USDA 1999), and clearcut harvesting is scheduled to occur at known sites. However, plethodontid salamander populations have been shown to persist where logging occurs and the Survey and Manage protections currently afforded this species on the majority (82 percent) of its range act to minimize the risk of habitat loss due to timber harvest. Additionally, fire effects analysis within the range of the Scott Bar salamander indicate that if a wildfire were to occur, the area would have mixed levels of stand mortality, resulting in a mosaic pattern of habitat effects (USDA 1999). Therefore, the Service finds that the synergistic effects of fire and logging do not threaten the continued existence of the Scott Bar salamander in the foreseeable future.

We have reviewed the petition and other information available in our files. Based on this review, we find that the petition and information in our files do not present substantial information suggesting that listing the Siskiyou Mountains salamander or Scott Bar salamander as threatened or endangered may be warranted at this time.

#### **References Cited**

A complete list of all references cited herein is available, upon request, from the Yreka Fish and Wildlife Office (see **ADDRESSES** section).

#### **Author**

The primary authors of this notice are staff of Yreka Fish and Wildlife Office, U.S. Fish and Wildlife Service, 1829 S. Oregon Street, Yreka, California 96097.

#### **Authority**

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: April 17, 2006.

#### **Kenneth Stansell,**

*Acting Director, U.S. Fish and Wildlife Service.*

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