

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

Endangered and Threatened Wildlife and Plants; 12-Month Finding for a Petition to List the Southern Torrent Salamander in California as Endangered or Threatened

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 12-month petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding for a petition to list the southern torrent salamander (*Rhyacotriton variegatus*) in northern California and southern Oregon under the Endangered Species Act of 1973, as amended. After review of all available scientific and commercial information, we find that listing the southern torrent salamander is not warranted at this time. The finding is based on the following information: The species still occurs throughout its entire historical range; the species persists in its habitats after habitat alterations have occurred, including logging; the lack of information on short-and long-term population trends for the species across its range; the adverse impacts to the species from logging, construction of logging roads, and logging related activities do not threaten the survival of the species; the lack of substantial information indicating that overutilization for commercial, recreational, scientific, or educational purposes adversely impacts the species; the lack of evidence showing conclusively that predation is a threat to the species' survival; current regulatory practices do not constitute a threat to the survival of the species; and the lack of information that the species is threatened by low gene flow and low genetic diversity across its range.

DATES: The finding for this document was made on May 31, 2000. Comments and information may be submitted until further notice.

ADDRESSES: Data, information, comments, and material concerning the petition finding may be submitted to the Field Supervisor, U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, 2800 Cottage Way, W-2605, Sacramento, California 95825-1864. The 12-month petition finding, supporting data, and comments are available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Ms. Ann Chrisney or Ms. Jan Knight at the

above address or telephone (916) 414-6600.

SUPPLEMENTARY INFORMATION:**Background**

Section 4(b)(3)(B) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), requires that, for any petition to revise the Lists of Endangered and Threatened Wildlife and Plants that presents substantial scientific and commercial information, we make a finding within 12 months of the date of the receipt of the petition on whether the petitioned action is (a) not warranted, (b) warranted, or (c) warranted but precluded from an immediate proposal by other pending proposals of higher priority. Such 12-month findings are to be published promptly in the **Federal Register**.

On May 31, 1994, we received a petition from Stephan Volker, dated May 24, 1994, to list the southern torrent salamander (*Rhyacotriton variegatus*) as threatened. Mr. Volker is an attorney representing the Environmental Protection Information Center, North Coast Environmental Center, Oregon Natural Resources Council, California Wilderness Coalition, Friends of the River, South Fork Mountain Defense Committee, Mendocino Environmental Center, Sierra Club, California Sportfishing Alliance, Willits Environmental Center, and Ancient Forest Defense Fund. The petition stated that timber harvesting fragmented the salamander's habitat on Federal and private lands, decimated its population, and sharply inhibited its dispersal capability. In a letter to Mr. Volker, dated June 10, 1994, we explained that, under the provisions of the Act, we must decide if the petition presents substantial scientific or commercial information that the requested action is warranted and, to the maximum extent practicable, make this finding within 90 days after receiving the petition and promptly publish it in the **Federal Register**. On November 15, 1994 (59 FR 58982), we designated the species as a category 2 candidate species. Although we no longer use this designation, a category 2 candidate was considered a species for which Federal listing may be appropriate, but persuasive data on biological vulnerability and threats were not available to support a proposed listing. Although no mandatory protection was conferred with this status, the notice of this status supported the need to conduct research to determine the threats and vulnerability of the species. On June 29, 1995, we determined that Mr. Volker's

petition presented substantial information that the requested action may be warranted, and we published an announcement of our administrative finding (60 FR 33785). At that time, we initiated a status review of the southern torrent salamander.

Due to a limited budget, listing actions required by court orders, and other higher listing priorities, we were unable to make a listing determination on this species in a timely manner. On April 10, 1995, a moratorium on listing actions (Public Law 104-6) took effect with the stipulation that no funds could be used to make final listing or critical habitat determinations. When the moratorium was lifted on April 26, 1996, a three-tier approach was established to rank the backlog of listing actions for fiscal year 1996 (May 16, 1996; 61 FR 24722). The 12-month status review for the southern torrent salamander was designated a Tier 3 activity, the lowest listing priority. On December 5, 1996, new listing guidance was published for fiscal year 1997 (61 FR 64475) that used a four-tier approach. The 12-month status review for the southern torrent salamander remained a Tier 3 activity. However, due to a continuing backlog of listing actions, we focused our resources on Tier 1 and Tier 2 actions until April 1, 1997. By April 1, 1997, we began to address Tier 3 actions, but a serious backlog of listing actions still existed. On May 8, 1998, we published the Listing Priority Guidance for FY 1998 and 1999 (63 FR 25502), and the 12-month status review for the southern torrent salamander was raised to Tier 2. Although we published 2 emergency listings, 47 final listings, 10 withdrawals, 48 proposed listings, and 18 petition findings, the southern torrent salamander was among 22 species with pending 12-month findings. On October 22, 1999, we published the Final Listing Priority Guidance for Fiscal Year 2000 (64 FR 57114). The tier approach was eliminated as a guide for handling our remaining backlog and future work in the listing program in favor of a priority system that identified higher priorities for certain listing actions. Processing administrative findings on petitions, such as the one for the southern torrent salamander, was designated a fourth priority.

Species Information

Southern torrent salamanders have very specific habitat requirements of cold, shallow, flowing headwaters in humid coniferous forests up to an elevation of 1,469 meters (m) (4,820 feet (ft)) (Nussbaum and Tait 1977;

Nussbaum *et al.* 1983; Diller and Wallace 1996; Welsh and Lind 1996). They are most frequently found in seeps, springs, and intermittent streams (Welsh 1993; Vesely 1996; Olson, *in litt.* 1999) or shallow water seeping through moss-covered gravel (Nussbaum *et al.* 1983) and appear to avoid open deep water channels (Stebbins 1985; Welsh 1993). The aquatic larvae usually occur in loose gravel in streambeds, and semiaquatic adults can be found next to larvae in streams, or under rocks or debris in saturated streamside habitats (Nussbaum and Tait 1977; Nussbaum *et al.* 1983).

The southern torrent salamander is very sensitive to desiccation (losing moisture through the skin) (Ray 1958) and cannot move far from moist areas. Movements of the southern torrent salamander have been estimated from 1 to 2.2 m (3 to 6 ft) per year (Welsh and Lind 1992) up to 50 m (160 ft) per year from permanent water (Good and Wake 1992). These larger movements, however, are thought to be rare (Good and Wake 1992). Southern torrent salamanders have also been found short distances from water after heavy rains (Nussbaum *et al.* 1983). Riparian areas are thought to be important to the species for foraging (Corn and Bury 1989) and courtship and reproduction (Nussbaum *et al.* 1983). If terrestrial visits are important for feeding, reproduction, and dispersal, then shade and high surface water availability are needed to allow for movement within these riparian areas.

Southern torrent salamanders can grow to approximately 9.5 centimeters (3.75 inches) in length (Good and Wake 1992). They have a low tolerance for high temperatures and are typically found in areas with temperatures between 5.8 and 12.0 degrees centigrade (°C) (10 to 22 degrees Fahrenheit (°F)) (Brattstrom 1963; Nussbaum *et al.* 1983). Lethal temperatures occur above 17.2 °C (63 °F) (Welsh and Lind 1996).

Southern torrent salamanders have a lengthy larval period of 3 to 3.5 years (Nussbaum and Tait 1977) and require an additional 1 to 1.5 years after metamorphosis to become sexually mature (Nussbaum and Tait 1977). Southern torrent salamanders are probably communal nesters, as other torrent salamanders may be (Nussbaum 1969), producing an average of 8.4 to 10.0 eggs each year (Nussbaum *et al.* 1983). The southern torrent salamander's food is primarily aquatic and semiaquatic invertebrates (Bury and Martin 1967).

The spaces between cobble or pebble-size stones found in streams appear to provide refuge for salamanders from

predators, such as fish and Pacific giant salamanders (*Dicamptodon ensatus*). Southern torrent salamanders are not frequently found in streams where large Pacific giant salamanders or fish are found. If southern torrent salamanders do occur in these streams, they are usually found in the margins where they can find cover, away from the deep pools and glides (Welsh 1993; Welsh and Olivier 1992; Welsh, pers. comm. 1995; Olson, pers. comm. 1995). Another potential predator of salamanders may include garter snakes (Nussbaum *et al.* 1983.)

Southern torrent salamanders have a patchy distribution across their range (Welsh and Lind 1992). Suitable habitat is naturally limited by the geology and topography of an area. While the southern torrent salamander may be locally abundant in certain areas, salamander populations are not found in all apparently suitable habitats. During surveys of apparently suitable habitats, researchers detect southern torrent salamanders only 20 to 80 percent of the time. This low level of detection may be due to the fact that random sampling techniques of suitable habitats may not provide an accurate picture of the southern torrent salamander occurrence due to the inherent patchiness of their distribution. Populations of the species may be disjunct due to geographical variations, microhabitat variability, or historical land management practices. Density estimates range widely from 0.04 individuals up to 41 individuals per square meter (11 square feet) (Nussbaum and Tait 1977; Corn and Bury 1989).

The range of the southern torrent salamander occurs within the coastal conifer forest belt of northern California and southern Oregon, specifically from southern Mendocino County, California, through the Coast Ranges, to the Little Nestucca River and the Grande Ronde Valley in Polk, Tillamook, and Yamhill Counties, Oregon (Good and Wake 1992). An isolated population exists on the west slope of the Cascade Mountains near Steamboat in Douglas County, Oregon, approximately 112 kilometers (70 miles) inland (Good and Wake 1992; B. Bury, National Biological Survey, pers. comm. 1995). Several new populations of southern torrent salamanders have been detected north of the Steamboat population on the south side of the Willamette River. These populations represent an extension of the known range (R.S. Wagner, United States Geological Service, Biological Research Division, pers. comm. 1998). Another disjunct population is thought to occur in south central Siskiyou County, California,

based on specimens in the Chico State University Museum that date back to the 1950s (H. Welsh, Forest Service, pers. comm. 1994). Good and Wake (1992) described this species as one of the most common members of the salamander fauna through much of its range.

According to the petitioner, 98 percent of the historical records of the southern torrent salamander in the Museum of Vertebrate Zoology (MVZ), University of California, Berkeley, represent only 42 populations detected in protected rights-of-way, county highways, or in State and national parklands that include less than 5 percent of the total range of the species. The MVZ records were collected from 1935 to 1989, with the majority (70 percent) collected after 1970. Our review of these records revealed approximately 151 sites where southern torrent salamanders were detected. The most recent location data obtained for this review, from a variety of formal and informal surveys conducted from 1987 to 1998, indicated approximately 781 sites containing southern torrent salamanders across its historical range from north-central Oregon to northern California. We expect some overlap in the sites documented in these two groups of data, but the level of overlap has not been analyzed. In addition, we have not attempted to define populations from this location information. Surveys for southern torrent salamanders across their range were conducted by Good and Wake (1992) and Wagner (*in litt.* 1998) and, in California, by Welsh (Welsh 1990; Welsh and Lind 1992; Welsh, *in litt.* 1998). According to Wake (University of California, pers. comm. 1995), southern torrent salamanders are found throughout their historical range.

Threats Analysis

Habitat

The petition to list the southern torrent salamander cited habitat fragmentation, population declines, and inhibited dispersal capability throughout the species' range as significant threats to the species. The petitioner suggested that large-scale timber harvesting is eliminating many subpopulations through destruction of required habitats. The petitioner further suggested that this species may require conditions and attributes unique to headwater streams in mature and old-growth forests and the species has minimal ability to withstand and recover from radical habitat alterations.

Evidence indicates that timber harvesting and road building negatively affect habitat requirements of the

southern torrent salamander (permanent water, rocky substrates, and low water temperatures). The direct effects of these activities include disturbance of substrate and killing of individual salamanders. Indirect effects include sedimentation of substrate used by the salamanders, increase in water temperatures to lethal levels, potential loss of permanent water flow, and potential increase in predator populations. Suitable habitat conditions and attributes for the southern torrent salamander appear to be more readily available in unlogged mature and old-growth forests than in logged areas (Welsh 1990; Diller 1996). In logged areas, the abundance of salamanders is lower or they are not detected at all, which indicates that logging may depress or locally extirpate these populations (Corn and Bury 1989; Welsh and Lind 1992). However, while some research has revealed negative impacts of logging and road construction on southern torrent salamander populations, other research and survey information indicates southern torrent salamanders still persist in some habitats that were logged 14 to 60 years ago (Nussbaum and Tait 1977; Corn and Bury 1989; Welsh and Lind 1992; Olson, *in litt.* 1994; Chinnici, *in litt.* 1995; Diller, *in litt.* 1995; Pious, *in litt.* 1995; Wright, *in litt.* 1995; J. Ambrose, Georgia-Pacific Corporation, pers. comm. 1995; J. Applegarth, Bureau of Land Management (BLM), pers. comm. 1995; S. Hopkins, BLM, pers. comm. 1995; K. Wright, BLM, pers. comm. 1995). Whether the species is recolonizing these areas or whether its long lifespan enables it to persist in marginal habitats until conditions improve is unknown. Factors that may mitigate lethal water temperatures in logged areas include the retention of deciduous vegetation and unmerchantable trees, cool water from underground springs, cool microclimates on north- or east-facing slopes, and coastal fog. Sedimentation of the substrate may be mitigated by the flushing of these sediments in higher gradient streams. Some research has reported a positive relationship between stream gradient and the presence of southern torrent salamanders in logged habitats (Welsh 1993; Welsh and Ollivier 1992; Diller 1996). The southern torrent salamander may also be capable of burrowing vertically in the substrate to find moist, cool conditions.

We agree that widespread logging of headwater habitats has negative impacts on southern torrent salamander populations through the destruction of suitable habitats. However, under

certain circumstances, populations appear to be persisting in altered habitats. We also believe that State and Federal agencies provide varying degrees of protective measures for maintaining aquatic and riparian habitats on forested lands (California Department of Forestry (CDF) 1992; USDA *et al.* 1993; Oregon Department of Forestry (ODF) 1994; USDA and USDI 1994a). The threat to this species from habitat destruction is directly related to protection provided by State, Federal, and private regulatory measures for timber harvest activities.

Federal Regulations for Timber Harvest

The trend of large-scale logging of mature and old-growth forests on public lands within the range of the southern torrent salamander has diminished since the Federal listing of the northern spotted owl (*Strix occidentalis caurina*) in 1990 (55 FR 26192). This trend toward lower timber production and less regeneration logging is reflected in the standards and guidelines for land management in the Record of Decision for the Northwest Forest Plan (USDA and USDI 1994a) and in Endangered Species Act consultations by us on timber sales and National Forest Land Management Plans (A. Brickey, Service, pers. comm. 2000; N. Lee, Service, pers. comm. 2000). Although clearcutting could mean an increase in timber production on private lands, clearcutting vast areas within a drainage is generally no longer a common or commonly accepted practice. Forest ecosystems are typically able to recover from small-scale disturbances, and the effects of timber harvest diminish as forests regenerate.

Public Land Regulations

We estimate that approximately 41 percent of the total range of the southern torrent salamander occurs on federally managed public forest lands in both Oregon and California (summarized from Davis *et al.* 1998; Kagan *et al.* 1999). A Forest Conference was convened by President Clinton in 1993 to resolve forest resource issues in the Pacific Northwest. As a result, a group of interdisciplinary, interagency experts, known as the Forest Ecosystem Management Assessment Team (FEMAT), came together to develop a comprehensive management plan for more than 137,128 hectares (ha) (24 million acres (ac)) of public forest lands. The outcomes were the FEMAT Report (USDA *et al.* 1993), a Supplemental Environmental Impact Statement (SEIS) (USDA and USDI 1994b), and, ultimately, a Record of Decision (ROD) (USDA and USDI 1994a) that amended

the planning documents of 19 national forests and 7 BLM Districts to implement an alternative that became known as the Northwest Forest Plan (Forest Plan). The FEMAT reports a total of 37 percent of the southern torrent salamander's range on Federal lands and 63 percent on State and private lands, an estimate very similar to that developed during this review (41 percent and 59 percent respectively).

One of the reasons identified in the petition to list the southern torrent salamander is a lack of protection for headwater habitats where this species is known to occur. The petitioner claims that 90 percent of the range of the southern torrent salamander is on lands that are harvestable or have been harvested. Referencing the FEMAT report, the petition states that "37 percent of the range of this salamander occurs on Federal lands, while 27 percent is on lands in the matrix (harvestable areas)." The petitioner's subsequent conclusion appears to be that the 27 percent of the total range of the species that occurs on public lands, plus the 63 percent of the species' range occurring on private lands (90 percent of the species' complete range) is open to harvest or has been harvested. We do not agree with this interpretation of the FEMAT report. Appendix Table IV-C-9 in the FEMAT report indicates that the percentage of land designated as matrix under the Forest Plan represents 25 percent of the 37 percent of the range that occurs on public lands (USDA *et al.* 1993). This amount is equal to less than 10 percent of the entire range of the species. The remaining 75 percent of the species' range on public lands occurs almost entirely in withdrawn areas or reserves (approximately 68 percent) and Adaptive Management Areas (approximately 6 percent) (USDA *et al.* 1993).

Furthermore, as described in the FEMAT report, the SEIS, and the ROD, all aquatic/riparian habitats on public lands covered by the Forest Plan are to be protected in riparian reserves. This means that any land allocations designated in the FEMAT report, including matrix lands, that include aquatic or riparian habitat are contained in riparian reserves that are designed to protect riparian and aquatic components from actions that will negatively impact them (M. Raphael, Forest Service, pers. comm. 1995). Therefore, the 27 percent figure quoted in the petition as salamander habitat that is at risk within matrix lands fails to take into account the riparian reserves protecting watercourses in the matrix (K. Denton, Forest Service, pers. comm. 1995). Riparian reserves apply to all streams,

lakes, ponds, and wetlands on Forest Service and BLM lands within the range of the northern spotted owl (USDA and USDI 1994b). The primary purpose of riparian reserves is to protect and maintain riparian resources and to attain the objectives of the Aquatic Conservation Strategy, which is part of the Forest Plan. This strategy is specifically designed to protect headwater tributaries (including intermittent streams, seeps and springs) and riparian areas (USDA *et al.* 1993; USDA and USDI 1994a).

The FEMAT report provides the most current risk analysis of the southern torrent salamander on public lands and states that implementation of the Forest Plan, as approved, would result in a very high likelihood that the majority (74 percent) of southern torrent salamander habitats on public lands would be well distributed and that the species population could stabilize, although with some limitation on interactions among populations. This analysis was based on the anticipated level of riparian protection in riparian reserves. The final ROD later doubled the riparian reserve widths for intermittent streams and wetlands of less than 1 ha (2.4 ac) from 15 to 30 m (50 to 100 ft) or one site-potential tree (the average height of a tree growing at that site). This change would protect more southern torrent salamander habitat than evaluated in the FEMAT report.

The Forest Plan has been in effect since April 1994. As of 1995, riparian reserves were generally being planned according to the intent of the Forest Plan (M. Boroja, Service, pers. comm. 1995; A. Brickey, pers. comm. 1995; P. Henson, Service, pers. comm. 1995; S. Livingston, Service, pers. comm. 1995). The land management agencies recognized that the procedure to adjust or decrease the widths of riparian reserves recommended in the Forest Plan was time-consuming, and, therefore, they did not generally pursue efforts to alter the widths. Additionally, it appeared that many riparian reserves were increased due to unstable geology. An interagency monitoring program in 1996 and 1997 evaluated whether the intent of the ROD and its guidelines was being met. Reports from both years concluded that the Forest Service and BLM were consistently meeting the intent of the ROD in developing riparian reserves.

The petitioner suggested that no-entry buffers of 33 m (100 ft) or the height of one site-potential tree should be established around small streams and headwaters in old-growth and mature conifer forests. In the Pacific northwest,

timber harvest adjacent to old-growth forests is estimated to affect the microclimate up to two tree lengths into the remaining forest stands (Franklin and Forman 1987 in Lehmkuhl and Ruggiero 1991; Harris 1984). Other estimates include microclimate effects from 30 to 240 m (approximately 100 to 800 ft) into interior forest, depending on the site and specific microclimate parameters (Chen *et al.* 1995 in Vesely 1996). There is general agreement that a protected buffer zone for streams, seeps, springs, and adjacent riparian habitat is necessary to maintain microclimates and prevent sedimentation in these watercourses. Based on the evidence that southern torrent salamanders appear to stay in very close proximity to watercourses, we believe the riparian reserve system of the currently adopted and court-tested Forest Plan provides adequate protective measures to maintain the quality of most of the riparian and aquatic habitats for the southern torrent salamander on public lands across the range of the species.

California Private Land Regulations

Approximately 26 percent of the southern torrent salamander's entire range occurs on private lands in California and 2 percent on California State lands. This species is designated as a species of special concern in California. Special concern status confers no legal protection for the species, but recognizes that the species should be closely monitored. In response to a 1994 petition to list the southern torrent salamander as threatened under State law, the California Fish and Game Commission (CFG), in conjunction with California Department of Fish and Game (CDFG), determined on January 8, 1996, that listing the species as threatened was not warranted (CFG, *in litt.* 1996). This decision was based on the presence of southern torrent salamanders in degraded habitat, improved logging practices, and inadequate information on the significance and causes of any population declines. However, these agencies improved protective measures for this species through changes in policies and regulations.

During the candidacy period (the period between the time a petition is accepted by the State and a final determination is required) from November 1994 to December 1995, training was provided to 64 biologists, 231 private foresters, and 60 CDF inspectors on how to recognize southern torrent salamander habitat and conduct surveys. The CDFG reported the following objectives for the 1-year candidacy period: (1) document as

many existing localities as possible on private land and at historic sites; (2) determine status of populations and habitat (and metapopulation structure); (3) examine population trends through the comparisons of managed and unmanaged lands; and (4) determine the adequacy of current forest practice rules to protect the species and its habitat (CDFG, *in litt.* 1995). A sampling protocol was developed to collect data to meet these objectives (CDFG *in litt.* 1995). However, to date, we are unaware of any results from objectives 2, 3, or 4 of the candidacy period.

Most of the suitable habitat for the southern torrent salamander occurs in what the CDF designates as Class II streams, which include perennial streams that are non-fish bearing but contain other aquatic life (CDF 1992). Protections for Class II streams include 15 to 30 m (50 to 100 ft) Watercourse and Lake Protection Zones (WLPZ) that retain at least 50 percent canopy closure, 25 percent overstory conifers, and 75 percent surface cover. No heavy equipment is allowed within the WLPZ, and roads, landings, and timber falling are limited to protect the beneficial uses of the watercourse. Any changes in the widths of the WLPZ or proposed activities within the WLPZ must first be carefully analyzed and reviewed to ensure protection of the beneficial uses of the stream. Some persons have speculated that Class II protection may be adequate to protect the southern torrent salamander and its habitat in the coastal forests but may not provide adequate protection in the more arid southern and eastern portions of the range (J. Brode, CDFG, pers. comm. 1994, Steele, CDFG, pers. comm. 1995).

We are aware that stream classification is highly subjective in the timber planning process. Habitat for southern torrent salamanders may also occur along streams that have been classified as Class III (streams, including seeps and springs, with no aquatic life but capable of sediment transport). In these areas, obvious aquatic life may not be apparent, the streams may appear dry, and they may not contain obvious channels or pools. Although these appear to be Class III streams, they may often provide suitable habitat for, and contain, the southern torrent salamander. The water level may be just above the surface or subsurface, and salamanders may not be detectable at all times of year. Incorrect classification of streams could potentially result in application of Class III stream protection measures being applied to habitats that are likely to contain southern torrent salamanders. Current protection for Class III streams is not adequate to

protect southern torrent salamander habitat (CFGC 1994).

The training of biologists and foresters resulted in some increased awareness of the significance of headwater streams, seeps, and springs as valuable aquatic habitats requiring Class II protection. Based on over a decade of field experience in habitat identification and stream classification in California, K. Moore (CDFG, pers. comm. 2000) estimates that perhaps 50 percent of suitable seep, spring, and stream habitat has been recognized and given some level of protection from logging activities. However, some seeps and springs that have not been identified as salamander habitat and retain no comprehensive protection under the State rules are still logged and burned (K. Moore, pers. comm. 1999).

We support a review of the Forest Practice Rules by CDFG and believe that Class II protection has the potential to provide some protection for the southern torrent salamander provided habitat is correctly identified. However, we are concerned about the effectiveness of timber harvest planning on private lands because of (1) the high ratio of Emergency and Exemption Notices to regular Timber Harvest Plans (THP) in California, (2) cumulative impacts not being addressed in THPs, and (3) a lack of THP enforcement (State of California 1994).

Oregon Private Land Regulations

Private lands in Oregon constitute approximately 31 percent of the southern torrent salamander's entire range. One percent of the salamander's range occurs on Oregon State lands. The salamander is designated as a sensitive species, subcategory vulnerable, by the State of Oregon. State sensitive classification refers to naturally reproducing native species that are likely to become threatened or endangered throughout all or any significant portion of their range in Oregon (Oregon Department of Fish and Wildlife (ODFW) 1993). The vulnerable category implies that listing the species is not imminent provided that continued or expanded use of protective measures and monitoring occurs (ODFW 1993). However, the southern torrent salamander is protected from being killed, harmed, or collected under the Oregon Administrative Rule section 635-44-130 (Nongame Wildlife Protected) (ODFW 1991). A State scientific collecting permit is required to take this species from the field for educational or research purposes (ODFW 1991).

Oregon Department of Forestry (ODF) rules establish Riparian Management

Areas (RMAs) adjacent to all Type D streams (non-fish-bearing streams with domestic water use) and Type N streams (all other streams except those fish-bearing streams with domestic water use), except for small Type N streams. The goal of these buffers is to protect water quality, hydrological function, and fish and wildlife habitat by requiring vegetation retention and special management practices. The RMAs range from 6 to 21 m (20 to 70 ft) and have retention standards for understory, overstory, snags, and logs. Further restrictions occur on road construction, yarding, stream crossings, and stream improvement. The RMAs offer some protection from direct impacts, but the protections may be too small to compensate for the effects on microclimates from logging. The areas most at risk are the small Type N streams where no RMAs are required and restrictions of logging activities are very flexible and left up to the operator's discretion in most cases. The few specific management recommendations for small Type N streams do not apply to the Coast Range and South Coast geographic regions, where the majority of the southern torrent salamander range occurs.

RMAs are not required for seeps and springs within the range of the southern torrent salamander in Oregon. The Oregon Forest Practice Rules state that operators shall protect hydrological functions of seeps, springs, and wetlands by minimizing disturbance to soils during forest operations (ODF 1994). The ODF interprets this rule to mean that no machinery is allowed in seeps, springs, or wetlands, and citations have been issued for this violation (J. Runion, ODF, pers. comm. 1995). Furthermore, the Oregon Forest Practice Rules recognize that amphibians may occur in small Type N streams and encourage operators to retain green trees and snags in blocks of intact vegetation of undetermined size (ODF 1994). The headwater habitats on private land in Oregon are probably not completely protected from the effects of logging, and some biologists in Oregon have expressed concerns about this lack of protection (J. Boechler, ODFW, pers. comm. 1995; R. Krahmer, ODF, pers. comm. 1995; C. Puchy, ODFW, pers. comm. 1995; K. Wright, pers. comm. 1995).

We believe that existing regulatory measures provide varying degrees of protection for southern torrent salamander habitat on public and private lands. The regulatory protection of aquatic and riparian habitat appears to be generally better on public lands than private lands and better for streams

than for seeps and springs. If we assume that southern torrent salamander habitat on all Federal lands (41 percent of the total range) has moderate to good protection, that approximately 50 percent of private land in California (13 percent of the total range) and 50 percent of private land in Oregon (16 percent of the total range) and all State lands (3 percent of the total range) have low to moderate protection, then 73 percent of the total range of the species is estimated to have some level of regulatory protection.

Although logging began in Pacific Northwest forests almost 200 years ago, State and Federal land management regulations that protect aquatic and riparian habitats have only been instituted in the last 20 to 30 years. Consequently for approximately 170 years, timber harvest in aquatic and riparian habitats was virtually unregulated. Therefore, some populations of southern torrent salamanders have persisted or recolonized in areas that had no protective buffers when they were harvested. Whether these individuals recolonized the area after regrowth of the surrounding vegetation or survived the habitat alteration is unclear. While the presence of individuals does not necessarily indicate viable populations, what is known is that both larvae and adults are being detected across the range of the species.

Based on the species' persistence, the fact that some level of regulatory protection occurs on an estimated three-quarters of the species' range, and the current trend in timberland management is away from clearcutting in riparian areas and toward increasing awareness of the significance of headwater habitats, we believe that current regulatory practices, while not ideal, provide sufficient protection to insure that the existence of the species is not threatened at this time. While recent improvements in protections of southern torrent salamander habitats have been implemented on Federal lands, habitats on private lands are still vulnerable until specific changes in policy and procedures change the way these habitats are protected. However, future trends toward protecting aquatic habitats for listed salmonids, including headwater habitats, should also benefit the southern torrent salamander. Based on our assumptions stated above concerning estimated regulatory protections, and the fact that the species appears to be distributed across its range and is persisting in altered habitats, we also conclude that habitat destruction or modification is not severe enough to

threaten the existence of the species at this time or in the foreseeable future.

Genetics

The genus *Rhyacotriton* has always been perceived as genetically isolated from other genera of salamanders (Good and Wake 1992). Research by Good and others in 1987 (Good *et al.* 1987 in Good and Wake 1992) showed "extreme and unexpectedly high levels of genetic differentiation" for *Rhyacotriton olympicus*, which at that time was considered a single species over the Pacific Northwest. Good *et al.* (1987 in Good and Wake 1992) divided *Rhyacotriton* into four genetically different populations. Good and Wake (1992) concluded that four separate species should be recognized within the genus *Rhyacotriton*, one of which is *Rhyacotriton variegatus*, the southern torrent salamander.

The genetic diversity within the southern torrent salamander is evidence of very low gene flow between populations. Good and Wake (1992) suggest that gene flow between populations of southern torrent salamanders at the extreme ends of the species' range is not likely to occur, but that gene flow among adjacent populations of southern torrent salamanders is what holds the species together as a cohesive unit. In reference to southern torrent salamander populations, Wake (*in litt.* 1994) stated "the genetic differentiation is strongly structured geographically, so that there is a pattern of isolation by distance. What this means is that genetic distance between populations builds directly as a function of geographic distance." In other words, as the geographical distance between populations increases, populations become more genetically different and isolated. This finding strongly implies that animals within each population seldom left their respective populations or moved between populations over a period of thousands of years (Wake, *in litt.* 1994). Therefore, southern torrent salamanders show a great deal of genetic differentiation between individual animals from different populations, but show very little differentiation between individuals within the same population.

Dr. Susan Haig and Steve Wagner of United States Geological Service in Corvallis, Oregon, have been conducting genetic studies on mitochondrial DNA sequences of the southern torrent salamander to investigate the extent of population divergence and the relationships among populations. The results of these studies will be evaluated after they have been peer-reviewed and published.

Because of the naturally low gene flow between southern torrent salamander populations and the great amount of genetic diversity between individuals within the species, the loss of subpopulations could mean a significant loss of genetic diversity. Low genetic diversity within a population or subpopulation is thought to decrease that group's ability to withstand catastrophic natural events or manmade impacts. We believe that the most vulnerable populations of southern torrent salamanders are those found on the southern and eastern edges of the range. These populations are suspected to be the most distinct genetically (Wake, *in litt.* 1994) and the most susceptible to the negative impacts of timber harvest. Although we recognize the implications of low genetic diversity for the southern torrent salamander, until adequate genetic studies are completed, information is lacking to make a determination that low genetic diversity and gene flow threaten the continued existence of the species. We will reevaluate this issue after results of ongoing genetic studies are available. However, we recommend that populations at the edge of the range be given high priority for determining population status and trends.

Conclusion

We recognize that the southern torrent salamander has very specific habitat requirements, a naturally patchy distribution across its range, and low gene flow between populations. The southern torrent salamander is not considered to be dependent solely on old-growth forests, but the preferred microclimate conditions are more readily available in mature and old-growth forests. We acknowledge that logging of headwater habitats in old-growth forests has depressed or extirpated some populations of this species. However, we believe that the trend of habitat loss for the southern torrent salamander is lessening across much of the range with a reduction in clearcutting and with some increased awareness and some protections of headwater habitats. The southern torrent salamander is present throughout its historical range, including populations in altered habitats, despite little or no stream protection at the time they were logged. Relevant ongoing research is being conducted on headwater habitats and the southern torrent salamander, but a current lack of general baseline information exists on population status and trends, and genetic diversity of the species.

On the basis of the best available scientific and commercial information, we find that the southern torrent salamander is not likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Therefore, listing the species as threatened is not warranted at the present time. The southern torrent salamander will remain as a species of concern for which evidence of vulnerability exists, but for which substantial data are lacking to support a proposal to list as threatened or endangered. We will continue to seek information on the status of the southern torrent salamander, and, if information becomes available indicating that listing as endangered or threatened is appropriate, we would propose to list the salamander. Furthermore, we retain the option of recognizing a subspecies or a population segment for listing should information become available indicating that such an action is appropriate and warranted.

References Cited

A complete list of all references cited herein is available on request from the Sacramento Fish and Wildlife Office (see ADDRESSES section).

Author. The primary author of this notice is Ann Chrisney, Sacramento Fish and Wildlife Office (see ADDRESSES section).

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

Dated: May 31, 2000.

Jamie Rapaport Clark,

Director, U.S. Fish and Wildlife Service.

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DEPARTMENT OF THE INTERIOR

National Park Service

National Register of Historic Places; Notification of Pending Nominations

Nominations for the following properties being considered for listing in the National Register were received by the National Park Service before May 26, 2000. Pursuant to § 60.13 of 36 CFR part 60 written comments concerning the significance of these properties under the National Register criteria for evaluation may be forwarded to the National Register, National Park Service, 1849 C St. NW., NC400, Washington, DC