establish a voluntary labeling regime for unidirectional digital cable television receivers and related digital cable products that meet certain technical specifications. This regime would include testing and self-certification standards, as well as consumer information disclosures to purchasers of such receivers and products. Compliance may also require multichannel video programming distributors to encode certain commercial audiovisual content to prevent or limit its copying and prohibit the use of selectable output controls. Cable operators with systems of 750 MHz or greater activated channel capacity may be required to support operation of unidirectional digital cable products on digital cable systems and to ensure that navigation devices utilized in connection with such systems have an IEEE 1394 interface and comply with specified technical standards. While these requirements could have an impact on consumer electronics manufacturers and multichannel video programming distributors, it remains unclear weather there would be a differential impact on small entities. We seek comment on whether the burden of these requirements would fall on large and small entities differently.

32. *Steps Taken to Minimize Significant Impact on Small Entities, and Significant Alternatives Considered.* The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.

33. As indicated above, the FNPRM seeks comment on whether the Commission should adopt or revise rules relating to the creation of a cable ''plug and play'' standard for digital cable television receivers and other digital cable television consumer electronics equipment in order to facilitate the DTV transition. This regime may require may require the manufacture of digital cable television receivers and other digital cable television consumer electronics equipment. Consumer electronics manufacturers may be required to establish a labeling regime for unidirectional digital cable television receivers and related digital cable products that meet certain technical specifications. This regime would include testing and self-certification standards, as well as consumer information disclosures to purchasers of such receivers and products. Compliance may also require multichannel video programming distributors to encode certain commercial audiovisual content to prevent or limit its copying and prohibit the use of selectable output controls. Cable operators with systems of 750 MHz or greater activated channel capacity may be required to support operation of unidirectional digital cable products on digital cable systems and to ensure that navigation devices utilized in connection with such systems have an IEEE 1394 interface and comply with specified technical standards. However, we welcome comment on modifications of the proposals if based on evidence of potential differential impact on smaller entities. In addition, the Regulatory Flexibility Act requires agencies to seek comment on possible small entity-related alternatives, as noted above. We therefore seek comment on alternatives to the proposed rules that would assist small entities while maintaining the compromise reached in the Memorandum of Understanding.

34. *Federal Rules Which Duplicate, Overlap, or Conflict with the Commission's Proposals.* None.

Federal Communications Commission.

Marlene H. Dortch,

Secretary.

[FR Doc. 03–948 Filed 1–15–03; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; 12-Month Finding for a Petition To List the Sierra Nevada Distinct Population Segment of the Mountain Yellow-legged Frog (*Rana muscosa*).

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 Sierra Nevada distinct population segment of the mountain yellow-legged frog (*Rana muscosa*) under the Endangered Species Act of 1973, as amended. After review of all available scientific and commercial information, we find that the petitioned action is warranted, but precluded by higher priority actions to amend the Lists of Endangered and Threatened Wildlife and Plants. Upon publication of this 12-month petition finding, this species will be added to our candidate species list. We will develop a proposed rule to list this population pursuant to our Listing Priority System.

DATES: The finding announced in this document was made on January 10, 2003. Comments and information may be submitted until further notice.

ADDRESSES: You may send data, information, comments, or questions concerning this finding to the Field Supervisor (Attn: MYLF), Sacramento Fish and Wildlife Office, U.S. Fish and Wildlife Service, 2800 Cottage Way, Room W–2605, Sacramento, California 95825. You may inspect the petition, administrative finding, supporting information, and comments received, during normal business hours by appointment, at the above address.

FOR FURTHER INFORMATION CONTACT: Peter Epanchin, Susan Moore, or Chris Nagano at the above address (telephone, (916) 414–6600; fax, (916) 414–6710).

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(B) of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*), requires that, for any petition to revise the List of Threatened and Endangered Species that contains substantial scientific and commercial information that listing may be warranted, 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, or (b) warranted, or (c) warranted but that the immediate proposal of a regulation implementing the petitioned action is precluded by other pending proposals to determine whether any species is threatened or endangered, and expeditious progress is being made to add or remove qualified species from the List of Threatened and Endangered Species. Section 4(b)(3)(C) of the Act requires that a petition for which the requested action is found to be warranted but precluded shall be treated as though resubmitted on the date of such finding, *i.e.*, requiring a subsequent finding to be made within 12 months. Such 12-month findings are to be published promptly in the **Federal Register**.

Taxonomy

Camp (1917) described the mountain yellow-legged frog as two subspecies of *Rana boylii: R. b. sierrae* in the Sierra Nevada, and *R. b. muscosa* in southern California. On the basis of the similar morphological (body structure) characteristics of the two subspecies, the small number of sites where both were found, and breeding experiments, *R. b. muscosa* and *R. b. sierrae* were split from the *R. boylii* group and combined under a single species, *R. muscosa* (Zweifel 1955). Genetic studies also have concluded that *R. muscosa* and *R. boylii* are distinct species (Case 1978; Davis 1986; Green 1986a, 1986b; Hillis and Davis 1986; Macey *et al.* 2001).

Description

The body length (snout to vent) of the mountain yellow-legged frog ranges from 40 to 80 millimeters (mm) (1.5 to 3.25 inches (in)) (Jennings and Hayes 1994). Females average slightly larger than males and males have a swollen, darkened thumb base (Wright and Wright 1949; Stebbins 1951; Zweifel 1955, 1968). Dorsal (upper) coloration in adults may be variable, exhibiting a mix of brown and yellow, but it also can be grey, red, or green-brown, and usually patterned with dark spots (Stebbins 1985; Jennings and Hayes 1994). These spots may be large (6 mm (0.25 in)) and few, smaller and more numerous, or a mixture of both (Zweifel 1955). Irregular lichen or moss-like patches (to which the name *muscosa* refers) also may be present on the dorsal surface (Zweifel 1955; Stebbins 1985). The belly and undersurfaces of the hind limbs are yellow or orange, and this pigmentation on the abdomen may extend forward to the forelimbs (Wright and Wright 1949; Stebbins 1985). This species may produce a distinctive mink or garlic-like odor when disturbed (Wright and Wright 1949; Stebbins 1985). Although the species lacks vocal sacks, it can make both terrestrial and underwater vocalizations, which have been described as a flat clicking sound (Zweifel 1955; Stebbins 1985; Ziesmer 1997). The mountain yellow-legged frog has smoother skin, generally heavier spotting and mottling dorsally, and darker toe tips than the foothill yellow-legged frog (*R. boylii*) (Zweifel 1955; Stebbins 1985).

Eggs of the mountain yellow-legged frog are laid in globular clumps, which are often somewhat flattened, roughly 2.5 to 5 cm (1 to 2 in) across (Stebbins 1985). When eggs are close to hatching, egg mass volume may average 198 cubic cm (78 cubic in) (Pope 1999a). Eggs have three firm jelly-like transparent envelopes surrounding a grey-tan or black vitelline (egg yolk) capsule (Wright and Wright 1949).

The larvae (tadpoles) of this species generally are mottled brown in dorsal coloration with a golden tint and a faintly-yellow venter (underside) (Zweifel 1955; Stebbins 1985). Total tadpole length reaches 72 mm (2.8 in), its body is flattened, and the tail musculature is wide, about 2.5 centimeters (cm) (1 in) or more, before tapering into a rounded tip (Wright and Wright 1949). The mouth has a maximum of 7 labial (lip) tooth rows (2–3 upper and 4 lower) (Stebbins 1985). Larvae often take 2 to 4 years or more to reach metamorphosis (transformation from larvae to frogs) (Wright and Wright 1949; Cory 1962b; Bradford 1983; Bradford *et al.* 1993; Knapp and Matthews 2000).

Range

The mountain yellow-legged frog is restricted to two disjunct areas in California and a portion of Nevada. One area is in the Sierra Nevada and the other area is in the San Gabriel, San Bernardino, and San Jacinto mountain ranges of southern California (Los Angeles, San Bernardino, Riverside, and San Diego counties) (Zweifel 1955; Jennings and Hayes 1994). The southern California population is isolated from the Sierra Nevada population by the Tehachapi mountain range, with a distance of about 225 kilometers (km) (140 miles (mi)) between the two populations.

In the Sierra Nevada, the historic distribution of the mountain yellow-legged frog was more or less continuous from the vicinity of La Porte in southern Plumas County southward to Taylor and French Joe Meadows in southern Tulare County (Jennings and Hayes 1994). Records for this species in the Sierra Nevada document its occurrence on the east and west sides of the crest in all major drainages from Plumas to Tulare counties, with a single record from Kern County (Zweifel 1955; Jennings and Hayes 1994; Knapp 1996). Except for historic populations in extreme western Nevada in Washoe and Douglas counties, on Mt. Rose near Lake Tahoe, possibly Edgewood Creek, and elsewhere around Lake Tahoe, the species is confined to California (Zweifel 1955). The elevational range for the mountain yellow-legged frog in the Sierra Nevada ranges from approximately 1,370 meters (m) (4,500 feet (ft)) at San Antonio Creek, near Dorrington in Calaveras County, to over 3,650 m (12,000 ft) at Desolation Lake in Fresno County, though populations typically are encountered in the upper half of that elevation range (Zweifel 1955; Mullally and Cunningham 1956; Stebbins 1985).

Habitat Requirements

Mountain yellow-legged frogs rarely are found more than 1 m (3.3 ft) from water (Stebbins 1951; Mullally and Cunningham 1956; Bradford *et al.* 1993). At the lower elevations in the Sierra Nevada, the species usually is associated with rocky stream beds and wet meadows surrounded by coniferous forest (Zweifel 1955; Zeiner *et al.* 1988). At higher elevations, the species occupies lakes, ponds, tarns, and streams (Zweifel 1955; Mullally and Cunningham 1956; Stebbins 1985). The borders of alpine (above treeline) lakes and montane (mountain) meadow streams used by mountain yellow-legged frogs are frequently grassy or muddy; this differs from the sandy or rocky shores that are inhabited by the amphibian in lower elevation streams (Zweifel 1955). Adults typically are found sitting on rocks along the shoreline, usually where there is little or no vegetation (Mullally and Cunningham 1956). Although the species may use a variety of shoreline habitats, both larvae and adults are less common at shorelines which drop abruptly to a depth of 60 cm (2 ft) than at open shorelines that gently slope up to shallow waters of only 5–8 cm (2–3 in) deep (Mullally and Cunningham 1956; Jennings and Hayes 1994). Mountain yellow-legged frogs also use stream habitats, especially in the northern part of their range. Streams utilized by adults vary from those having high gradients with numerous pools, rapids, and small waterfalls, to those with low gradients with slow flows, marshy edges, and sod banks (Zweifel 1955). Aquatic substrates vary from bedrock to fine sand, rubble (rock fragments), and boulders (Zweifel 1955). Mountain yellow-legged frogs seem to be absent from the smallest creeks, probably because these have insufficient depth for adequate refuge and overwintering habitat (Jennings and Hayes 1994).

Both adults and larvae overwinter for up to 9 months in the bottoms of lakes that are at least 1.7 m (5.6 ft) deep; however, overwinter survival may be greater in lakes that are at least 2.5 m (8.2 ft) deep, under ledges of stream or lake banks, or in rocky streams (Bradford 1983; V. Vredenburg *et al.* (in press)). In some instances, frogs have been found to overwinter in underwater bedrock crevices between 0.2 m (0.7 ft) and 1 m (3.3 ft) below the water surface (Matthews and Pope 1999) and the use of such crevices appears to allow them to survive in shallower water bodies that freeze to the bottom in winter (Pope 1999a). In lakes and ponds that do not freeze to the bottom in winter, mountain yellow-legged frogs may overwinter in the shelter of bedrock crevices as a behavioral response to the presence of introduced fishes (V. Vredenburg *et al.* (in press)).

Adult mountain yellow-legged frogs breed in the shallows of ponds or in inlet streams and are often seen on wet substrates within 1 m (3 ft) of the water's edge (Zweifel 1955). Adults emerge from overwintering sites immediately following snowmelt and will move over ice to get to breeding sites (Pope 1999a; V. Vredenburg in litt. 2002). Mountain yellow-legged frogs in the Sierra Nevada deposit their eggs underwater in clusters, which they attach to rocks, gravel, vegetation, or under banks (Wright and Wright 1949; Stebbins 1951; Zweifel 1955; Pope 1999a). Clutch size varies from 15 to 350 eggs per egg mass (Livezey and Wright 1945; V. Vredenburg *et al.* (in press)). In laboratory breeding experiments, egg hatching times ranged from 18 to 21 days at temperatures ranging from 5 to 13.5 Celsius (°C) (41 to 56 Fahrenheit (°F)) (Zweifel 1955). Field observations are similar (Pope 1999a).

The time required to develop from fertilization to metamorphosis is believed to vary between 1 and 4 years (Storer 1925; Wright and Wright 1949; Zweifel 1955; Cory 1962b; V. Vredenburg *et al.* (in press)). Since larvae must overwinter at least two or three times before metamorphosis, successful breeding sites are located in, or connected to, lakes and ponds that do not dry in the summer, and that are sufficiently deep so as to not completely freeze through in winter (Bradford 1983). Larval survival to metamorphosis is possible in lakes that do not dry out during the summer. Knapp and Matthews (2000) found the number of larvae was larger in fishless water bodies deeper than 2 m (6.5 ft). Bradford (1983) found that mountain yellow-legged frog die-offs sometimes result from oxygen depletion during winter in lakes less than 4 m (13 ft) deep. However, larvae may survive for months in nearly anoxic (oxygen-deficient) conditions when shallow lakes are frozen to the bottom. Recent studies have reported populations of mountain yellow-legged frogs overwintering in lakes less than 1.5 m (5 ft) deep that were assumed to have frozen to the bottom, and yet healthy frogs were documented to emerge the following July (Matthews and Pope 1999; Pope 1999a). Radio telemetry indicated that the mountain yellow-legged frogs were utilizing rock crevices near shore, crevices, holes, and ledges where water depths ranged from 0.2 m (0.7 ft) to 1.5 m (5 ft) (Matthews and Pope 1999). The granite surrounding these overwintering habitats may insulate the mountain yellow-legged frogs from the extreme winter temperatures, providing that there is an adequate supply of oxygen either in the water or air (Matthews and Pope 1999).

Larvae maintain a relatively high body temperature by selecting warmer microhabitats (Bradford 1984). During winter, larvae remain in warmer water below the thermocline (thermally stratified water); after spring overturn (thaw and thermal mixing of the water), they continue to behaviorally modulate their body temperature by daily movements: during the day, larvae move to warm, shallow, nearshore water, and during the late afternoon and evening, they retreat to the warmer waters off shore (Bradford 1984).

The time required to reach reproductive maturity is thought to vary between 3 and 4 years after metamorphosis (Zweifel 1955). Longevity of adults is unknown, but adult survivorship from year to year is very high, so they are undoubtedly long-lived amphibians (Matthews and Pope 1999; Pope 1999a). Although data currently are limited, evidence exists that mountain yellow-legged frogs display strong site fidelity and return to the same overwintering and summer habitats from year to year (Pope 1999a).

In aquatic habitats, mountain yellow-legged frog adults typically move only a few hundred meters (few hundred yards) (Matthews and Pope 1999; Pope 1999a), but distances of up to 1 km (0.62 mi) have been recorded (V. Vredenburg *et al.* (in press)). Adults tend to move between selected breeding, feeding, and overwintering habitats during the course of the year. Though adults are typically found within 1 m (3.3 ft) of water, overland movements of over 65 m (215 ft) have been recorded (Pope 1999a); the furthest reported distance of a mountain yellow-legged frog from water is 400 m (1,300 ft) (V. Vredenburg *et al.* (in press). Almost no data exist on the dispersal of juvenile mountain yellow-legged frogs away from breeding sites (Bradford 1991). However, juveniles that may be dispersing to permanent water have been observed in small intermittent streams (Bradford 1991). Mountain yellow-legged frog population dynamics are thought to have a metapopulation structure (Bradford *et al.* 1993; Drost and Fellers 1996; Knapp and Matthews 2000). In describing the metapopulation concept, Hanski and Simberloff (1997) stated: ''* * *the two key premises in this approach to population biology are that populations are spatially structured in assemblages of local breeding populations and that migration among the local populations has some effect on local dynamics, including the possibility of population reestablishment following extinction.''

Adult mountain yellow-legged frogs are thought to feed preferentially upon terrestrial insects and adult stages of aquatic insects while on the shore and in shallow water (Bradford 1983). Feeding studies on Sierra Nevada mountain yellow-legged frogs are limited. Remains found inside the stomachs of mountain yellow-legged frogs in southern California include a wide variety of invertebrates, including beetles, ants, bees, wasps, flies, true-bugs, and dragonflies (Long 1970). Larger frogs take more aquatic true bugs (insects in the taxonomic order Hemiptera) probably because of their more aquatic behavior (Jennings and Hayes 1994). Adult mountain yellow-legged frogs have been observed eating Yosemite toad (*Bufo canorus*) and Pacific treefrog (*Pseudacris regilla*) larvae (Mullally 1953; Zeiner *et al.* 1988; Pope 1999b; Feldman and Wilkinson 2000) and can be cannibalistic (Heller 1960). Mountain yellow-legged frog larvae graze on benthic detritus, algae, and diatoms along rocky bottoms in streams, lakes, and ponds (Bradford 1983; Zeiner *et al.* 1988). Larvae have also been observed cannibalizing conspecific (of the same species) eggs (Vredenburg 2000). In addition, larvae have been seen feeding on the carcasses of dead metamorphosed frogs (V. Vredenburg *et al.* (in press)).

Status

The distribution of the Sierra Nevada mountain yellow-legged frog is restricted primarily to publicly managed lands at high elevations, including streams, lakes, ponds, and meadow wetlands located on national forests, including wilderness and non-wilderness on the forests, and national parks. Approximately 210 known mountain yellow-legged frog populations (or populations within metapopulations) exist on the national forests within the Sierra Nevada, though not all of these populations may be reproducing successfully. In the national parks of the Sierra Nevada, there are 758 known sites with mountain yellow legged-frogs, most of which occur within 59 different basins that have multiple breeding populations that are connected hydrologially, so that populations in each basin function as metapopulations). Within these 758 sites, 330 populations exist for which we have evidence of successful reproduction. Overall, we estimate that 22 percent of the remaining mountain yellow-legged frog sites within the Sierra Nevada are found within the national forests (including those with and those without evidence of successful reproduction), while 78 percent are found within the national parks (including those with and those without evidence of successful reproduction). These percentages represent the number of sites within the national forests and the national parks of the Sierra Nevada; they do not represent the number of individuals present at each site. The methods for measuring the numbers of populations and metapopulations in the national forests and the national parks have not been standardized and, therefore we must use caution when we compare national forests numbers to national park numbers. However, the remaining populations of mountain yellow-legged frogs are more numerous and larger in size in the national parks than in the national forests.

National forests with extant populations of mountain yellow-legged frogs include the Plumas National Forest, Tahoe National Forest, Humboldt-Toiyabe National Forest, Lake Tahoe Basin Management Unit (managed by the U.S. Forest Service (USFS)), Eldorado National Forest, Stanislaus National Forest, Sierra National Forest, Sequoia National Forest, and Inyo National Forest. National parks with extant populations of mountain yellow-legged frogs include Yosemite National Park, Kings Canyon National Park, and Sequoia National Park.

Grinnell and Storer (1924) first observed declines of mountain yellow-legged frog populations. Since then, a number of researchers have reported that the mountain yellow-legged frog has disappeared from a significant portion of its historic range in the Sierra Nevada (Hayes and Jennings 1986; Bradford 1989; Jennings and Hayes 1994; Bradford *et al.* 1994a; Jennings 1995, 1996; Stebbins and Cohen 1995; Drost and Fellers 1996; Knapp and Matthews 2000). The observed declines of mountain yellow-legged frog populations in the 1970s were small relative to the declines observed during the 1980s and 1990s. Rangewide, it is estimated that mountain yellow-legged frog populations have undergone a 50 to 80 percent reduction in size (Bradford *et al.* 1994a; Jennings 1995; Stebbins and Cohen 1995; Drost and Fellers 1996; Jennings 1996; Knapp and Matthews 2000). The most pronounced declines have occurred north of Lake Tahoe in the northernmost 125 km (78 mi) portion of the range, and south of Sequoia and Kings Canyon National Parks in Tulare County in the southernmost 50 km (31 mi) portion, where only a few populations remain (Fellers 1994; Jennings and Hayes 1994). Based on available USFS survey and observation data, there appear to be very few or no known large populations north of the Plumas National Forest.

Mountain yellow-legged frogs historically occurred in Nevada on the slopes of Mount Rose in Washoe County and probably in the vicinity of Lake Tahoe in Douglas County (Linsdale 1940; Zweifel 1955; Jennings 1984). In 1994 and 1995, mountain yellow-legged frog surveys were conducted by Panik (1995) at 54 sites in the Carson Range of Nevada and California, including eight historic locations; no mountain yellow-legged frogs were observed. A few scattered and unconfirmed sightings were reported in Nevada in the late 1990s, but any populations remaining in this State are likely to be extremely small and the species is thought to be extirpated from Nevada (R. Panik, Western Nevada Community College, *in litt.,* 2002).

The number of extant populations of the mountain yellow-legged frogs in the Sierra Nevada is greatly reduced. Remaining populations are patchily scattered throughout nearly all their historic range (Jennings and Hayes 1994; Jennings 1995, 1996). At the northernmost portions of the range in Butte and Plumas counties, few populations have been seen or discovered since 1970 (Jennings and Hayes 1994). Declines have also been noted in the central and southern Sierra (Drost and Fellers 1996). In the southern Sierra Nevada (Sierra, Sequoia, and Inyo National Forests; and Sequoia, Kings Canyon, and Yosemite National Parks), there are relatively large populations (*e.g.*, breeding populations of over 20 adults) of mountain yellow-legged frogs; however, in recent years, some of the largest of these populations have been extirpated (Bradford 1991; Bradford *et al.* 1994a; R. Knapp, Sierra Nevada Aquatic Research Laboratory, *in litt.* 2002). Mountain yellow-legged frog populations are more numerous and larger in size in the national parks of the Sierra Nevada than in the surrounding USFS lands (Bradford *et al.* 1994a; Knapp and Matthews 2000).

Between 1988 and 1991, Bradford *et al.* (1994a) resurveyed sites known historically (between 1955 and 1979) to have contained mountain yellow-legged frogs. They resurveyed 27 historic sites on the Kaweah River, a western watershed within Sequoia National Park, and did not detect mountain yellow-legged frogs at any of these locations. They resurveyed 21 historic sites within the Kern, Kings, and San Joaquin River watersheds in Sequoia and Kings Canyon National Parks, and detected mountain yellow-legged frogs at 11 of these sites. Frogs were detected at three locations out of 24 historic sites outside of Sequoia and Kings Canyon National Parks. Rangewide, their resurvey effort detected mountain yellow-legged frogs at 14 of 72 historic sites, representing an 80 percent population decline. On the basis of these results, Bradford *et al.* (1994a) estimated a 50 percent population decline in Sequoia and Kings Canyon National Parks, with more pronounced declines elsewhere in the mountain yellow-legged frog's range.

Drost and Fellers (1996) surveyed for mountain yellow-legged frogs at sites documented by Grinnell and Storer (1924) in the early part of the 20th Century. The frog was reported to be the most common amphibian where they surveyed in the Yosemite area (Grinnell and Storer 1924). Drost and Fellers (1996) repeated Grinnell and Storer's 1924 survey and reported mountain yellow-legged frog presence at only 2 of the 14 sites where this animal had been previously detected. These two positive sightings consisted of a single larva at one site and a single adult female at another site. Drost and Fellers (1996) identified and surveyed 17 additional sites with suitable mountain yellow-legged frog habitat, and these surveys resulted in the detection of three additional populations.

For the 86 historically occupied mountain yellow-legged frog sites documented between 1915 and 1959 and resurveyed by Bradford *et al.* (1994a) and Drost and Fellers (1996), an 80 percent decline occurred in the number of historical frog populations. Of the 86 historic sites, only 16 remained occupied at the time of resurvey.

Knapp and Matthews (2000) surveyed more than 1,700 high elevation (averaging 3,400 m (11,150 ft)) lakes and ponds in the Sierra National Forest's John Muir Wilderness Area and in Kings Canyon National Park, encompassing a total of approximately 100,000 hectares (ha) (247,000 acres (ac)). They found a strong negative correlation between introduced trout and the distribution of mountain yellow-legged frogs. In the summer of 2002, Knapp (*in litt.* 2002) resurveyed 302 water bodies determined by 1995 to 1997 surveys to be occupied by mountain yellow-legged frogs, and resurveyed 744 of over 1,400 sites where frogs were not previously detected. Knapp found no change in status at 59 percent of these sites, but found that 41 percent of the sites had gone extinct, while 8 percent of previously unoccupied sites were colonized. These data indicate an extinction rate that is 5 to 6 times higher than the colonization rate within this study area. This high rate of extinction over a 5- to-7-year time frame suggests the species may become extinct within a few decades (assuming that the rate of extinction and recolonization observed over this time period accurately reflects the long-term rates). The documented extinctions appeared to occur nonrandomly across the landscape, are spatially clumped typically, and involve the disappearance of all or nearly all mountain yellow-legged frog populations in a watershed (R. Knapp *in litt.* 2002). The colonization sites also appeared to be nonrandomly distributed, occurring primarily in watersheds with large mountain yellow-legged frog populations (R. Knapp *in litt.* 2002).

A recent review of the current status of 255 previously documented mountain yellow-legged frog locations (based on Jennings and Hayes (1994)) throughout its historic range concluded that 83 percent of these sites are no longer occupied by this species (Davidson *et al.* 2002). Each national forest and national park is discussed individually below.

Lassen National Forest: Historically, mountain yellow-legged frogs occurred on the Lassen National Forest within multiple watersheds, including Butte Creek, the West Branch Feather River, and the Middle Fork Feather River (M. McFarland, *in litt.* 2002). The last confirmed mountain yellow-legged frog sighting on the Lassen National Forest was made in 1966 in the area of Snag Lake in the West Branch Feather River watershed. Since 1993, the Lassen National Forest has conducted or funded informal and formal systematic amphibian surveys to assess the relative distribution and abundance of amphibian species, including the mountain yellow-legged frog. On the Lassen National Forest, mountain yellow-legged frogs have not been detected or confirmed during any of these surveys (M. McFarland *in litt.* 2002).

Plumas National Forest: Based on resurvey efforts, Jennings and Hayes (1994) noted that the mountain yellow-legged frog was extirpated at a number of locations in the Plumas National Forest. As survey efforts continue by the Plumas National Forest, more mountain yellow-legged frog populations are being documented. However, most of the estimated 55 populations are small, consisting of only a few individuals (T. Hopkins, USFS, pers. comm., 2002). The species appears to have disappeared from a significant number of historic locations, and the abundance of the species at known sites appears to be quite low.

Tahoe National Forest: Mountain yellow-legged frogs were present historically throughout the Tahoe National Forest and the surrounding areas of Sierra, Nevada, and Placer counties. Jennings and Hayes (1994) conclude that, based on their re-surveys of historic locations, 1992, the species had been extirpated in a number of locations by 1992.

The Tahoe National Forest has been conducting some amphibian surveys. Approximately four or five extant populations exist in which mountain yellow-legged frog breeding has been documented (A. Carlson, USFS, pers. comm. 2002). Extant mountain yellow-legged frog populations on the Tahoe National Forest have been observed in both stream and pond habitats. One extant breeding population inhabits an old mining tailing pond that has been restored naturally to a forested wetland condition with an abundance of bankside and emergent vegetation (A. Carlson, pers. comm. 2002). The largest Tahoe National Forest population observed in recent surveys consists of fewer than 10 individuals. The species appears to have disappeared from a significant number of historic locations within the Tahoe National Forest and is in low abundance where it still persists (A. Carlson, pers. comm. 2002).

Lake Tahoe Basin Management Unit: Historic sightings of the mountain yellow-legged frog in the Lake Tahoe Basin Management Unit are numerous, indicating that the species was abundant in the Lake Tahoe area (J. Reiner, USFS, pers. comm. 2002). Today, only one known population of mountain yellow-legged frogs remains on this national forest, although in 1997, the USFS saw evidence of limited breeding in the Desolation Wilderness (J. Reiner, pers. comm. 2002; J. Reiner and M. Schlesinger, USFS, *in litt.* 2000). The known population is small, as some adults were seen in 1999 but were not detected during 2002 surveys, though larvae were detected. The habitat at this site is a meadow and stream complex that is large (approximately 24 ha (60 ac)) and in good condition (J. Reiner, pers. comm. 2002).

Humboldt-Toiyabe National Forest: Only the westernmost portion of the Humboldt-Toiyabe National Forest is within the historic range of the mountain yellow-legged frog (Stebbins 1985). A distributional map of mountain yellow-legged frogs produced by Jennings and Hayes (1994) indicates historic collections of this species within the Humboldt-Toiyabe National Forest in California. Resurveys of locations where mountain yellow-legged frogs occurred indicate that the species had become extirpated by 1992 at a number of locations in Humboldt-Toiyabe National Forest (Jennings and Hayes 1994). Surveys in California are ongoing. Approximately four populations (all in California) exist on this national forest (C. Milliron, California Department of Fish and Game (CDFG), *in litt.* 2002; L. Murphy, USFS, pers. comm. 2002). Chytrid fungus (see Factor C, Disease, below) has been documented at one of these populations (C. Milliron, *in litt.* 2002).

Eldorado National Forest: The mountain yellow-legged frog is distributed across the Eldorado National Forest with populations or metapopulations (multiple breeding populations within the same basin that have hydrologic connectivity between them) within the headwaters and headwater tributaries of several watersheds, including the Rubicon River, the South Fork American River, the North Fork Cosumnes River, and the North Fork Mokelumne River (J. Williams, USFS, *in litt.* 2002).

Numerous surveys for mountain yellow-legged frogs have been conducted on this national forest by the USFS, the CDFG, and several contractors between 1990 and 2002. Reproducing populations have been found at a variety of locations in high elevation areas of this national forest. Surveys for amphibians within the Eldorado National Forest in 1992 resulted in no detections of mountain yellow-legged frogs, though this may be a function of the limited area and habitat type that was surveyed (Martin 1992). Jennings and Hayes (1994) indicate both extirpated populations and extant populations on the Eldorado National Forest. Intensive surveys by CDFG and USFS in 2001 and 2002 resulted in an estimated 18 extant populations or metapopulations of mountain yellow-legged frogs on the Eldorado National Forest, although both the mean number of populations and population size are generally low relative to historic reports (J. Williams, *in litt.* 2002). Currently, approximately four populations exist with between 25 and 50 mountain yellow-legged frogs; these are the largest populations on the Eldorado National Forest (J. Williams, *in litt.* 2002).

Stanislaus National Forest: A 1992 survey (Martin 1992) in the Stanislaus National Forest located mountain yellow-legged frogs at only 2 of 16 locations surveyed, and at these locations, the numbers of adults detected were small (under five). Jennings and Hayes (1994) indicate that the species has been extirpated from a number of historic locations. There are approximately 80 extant populations of mountain yellow-legged frogs on the Stanislaus National Forest; of these, only about 8 appear to have more than 10 adults, and only 2 populations are known to have 25 to 30 adults (L. Conway, USFS, pers. comm. 2002).

Yosemite National Park: From 1914 to 1920, Grinnell and Storer conducted a biological survey along a transect across the Sierra Nevada. They documented mountain yellow-legged frogs at 14 sites throughout Yosemite National Park and noted the species was abundant in this area. Numerous frogs were found in lakes and streams at high elevations (Grinell and Storer 1924). ''Hundreds of frogs'' were found at Young Lake and frogs were ''very numerous'' at Westfall Meadow (Camp1915, as cited in Drost and Fellers 1994). Large numbers of specimens were collected; for example, 25 were taken at Vogelsang Lake (Grinnell 1915, as cited in Drost and Fellers 1994).

The mountain yellow-legged frog was documented at several additional locations in Yosemite National Park from 1957 to 1960 (Heller 1960). At Johnson Lake, Mullally and Cunningham (1956) reported a mountain yellow-legged frog population decline between 1950 and 1955, though they did not quantify the decline. They attributed this decline to the unusually long and cold winter of 1951–1952. Some of Yosemite's ''densest aggregations of frogs ever noted'' by Mullally and Cunningham (1956) were in lakes near Ostrander Lake south of Glacier Point; they attributed the absence of frogs in Ostrander Lake to the presence of non-native trout.

Between 1988 and 1991, Bradford *et al.* (1994a) randomly selected and surveyed four mountain yellow-legged frog populations documented in Yosemite between 1955 to 1979. Although they did not resurvey all of the mountain yellow-legged frog populations previously reported from within the park, they reported that the four resurveyed populations were extirpated (Bradford *et al.*1994a). In 1992 and 1993, Drost and Fellers (1996) revisited 38 of the original 40 sites surveyed by Grinnell and Storer from 1914 to1920, and surveyed other sites with potential mountain yellow-legged frog habitat. The mountain yellow-legged frog had declined by approximately 80 percent from the locations documented by the 1924 study (Drost and Fellers 1996). A distribution map of mountain yellow-legged frogs produced by Jennings and Hayes (1994) also documents extinctions and indicates a population decline of this species from Yosemite National Park. Colwell and Beatty (2002) surveyed 35 lakes with appropriate mountain yellow-legged frog habitat within the Tuolumne and Merced River drainages of Yosemite National Park in 1992 and 1993; only 3 lakes were found to have mountain yellow-legged frogs.

Currently in Yosemite National Park, 251 mountain yellow-legged frog sites exist, most of which occur within 23 different basins that have multiple breeding populations with habitat that is connected hydrologically, so that the populations in each basin function as a metapopulation (R. Knapp *in litt.* 2002). Six sites have populations with over 100 adult mountain yellow-legged frogs each, 1 site has a population with between 51 and 100 adults, and 41 sites have populations between 10 and 50 adults each. In addition, 203 sites have fewer than 10 adults each. Of the 251 mountain-yellow legged frog sites in the park, evidence of breeding has been found in 71 populations.

Inyo National Forest: Jennings and Hayes (1994) document the extirpation of some mountain yellow-legged frog populations from the Inyo National Forest. In 1994, 15 known locations had mountain yellow-legged frog populations (Parker 1994). Currently, 7 basins within the Inyo National Forest have known extant mountain yellow-legged frog populations or populations that function as metapopulations (C. Milliron, *in litt.* 2002). Some of these populations are stable, consisting of several hundred individuals representing all age classes (L. Sims, USFS, *in litt.* 2002). Chytrid fungus (see Factor C, Disease, below) has been documented at an additional population location that is now extinct (C. Milliron, *in litt.* 2002).

Sierra National Forest: In 1955, Mullally and Cunningham (1956) reported encountering mountain yellow-legged frogs along Paiute Creek ''very sparingly'' at approximately 2,300 m (7,700 ft), with frogs becoming more abundant at higher elevations. The ''densest populations'' were found above 3,050 m (10,000 ft) in the Humphrey's Basin area, and a ''great many, including tadpoles'' were noted at and near Pine Creek Pass, with frogs also seen at Golden Trout and Desolation Lakes.

Jennings and Hayes (1994) indicated that the mountain yellow-legged frog has become extirpated at a number of historical locations in the Sierra National Forest. Knapp and Matthews (2000) report on mountain yellow-legged frog population declines associated with fish stocking within the John Muir Wilderness Area of the Sierra National Forest (see Factor C, Disease, below). In 1995 and 1996, Knapp and Matthews (2000) surveyed 669 lakes, ponds, and other water bodies in the John Muir Wilderness Area. Mountain yellow-legged frog adults were found in 4 percent of these water bodies, and frog larvae in 3 percent (Knapp and Mathews 2000). In 2002, Knapp conducted resurveys at the 28 water bodies that had been occupied by mountain yellow-legged frogs in 1997, and also at 118 of the 641 sites where frogs were not detected in 1997. Knapp found no change in mountain yellow-legged frog status at 39 percent of these 28 previously occupied water bodies, but found that the frogs at 61 percent of the 28 previously occupied sites had gone extinct, while colonization had occurred at 10 percent of 118 previously unoccupied sites (R. Knapp *in litt.* 2002).

Although not all potential mountain yellow-legged frog habitats have been surveyed within the Sierra National Forest, approximately six subwatersheds have extant metapopulations (H. Eddinger, USFS, *in litt.* 2002). These subwatersheds are in the upper headwaters of the South Fork Merced River, South Fork San Joaquin River, and North Fork Kings River. They include the Mono Creek Basin, the Bear Creek Basin, the Paiute Creek Basin, the Humphreys Creek Basin, the Big Creek Basin, and the Dinkey Creek Basin.

Sequoia and Kings Canyon National Parks: Relatively few records exist for mountain yellow-legged frog prior to 1955 in the Sequoia and Kings Canyon National Parks. From 1955 to 1979, the species is known to have occurred in at least 21 sites scattered throughout Sequoia and Kings Canyon National Parks, although historic abundance is not known (Bradford *et al.* 1994a). In 1978–1979, the headwaters of seven creek systems were surveyed for mountain yellow-legged frogs in the national parks. Frogs were found at 27 sites greater than 200 m (660 ft) apart (Bradford *et al.* 1994a). A distributional map of mountain yellow-legged frogs produced by Jennings and Hayes (1994) indicates numerous historic sightings and collections of the species within both national parks, as well as numerous extinctions. The species was already noted to have disappeared from approximately half of previously occupied locations in Sequoia and Kings Canyon Parks by the late 1980s (Bradford *et al.* 1994a). On the basis of surveys, Bradford *et al.* (1994a) estimate that mountain yellow-legged frogs have been extirpated from half of their historic locations in Sequoia and Kings Canyon National Parks. For example, Fellers (1994) surveyed in Sequoia and Kings Canyon National Parks and did not detect the mountain yellow-legged frog in the Kaweah watershed where the species was located historically.

In 1997, Knapp and Matthews (2000) surveyed 1,059 lakes, ponds, and other water bodies in Kings Canyon National Park. Mountain yellow-legged frog adults were found in 31 percent of these water bodies, and frog larvae in 20 percent (Knapp and Mathews 2000). Some significant frog populations remain in Sequoia and Kings Canyon National Parks, but extensive declines have been described. In 2002, Knapp (*in litt.* 2002) resurveyed 274 water bodies occupied by mountain yellow-legged frogs in 1997, and he also resurveyed 626 of the 785 sites where frogs were not detected in 1997. Knapp found no change in status at 60 percent of the 274 previously occupied sites, but found that 39 percent of the 274 previously occupied sites had gone extinct, while colonization had occurred at 7 percent of 626 previously unoccupied sites.

Currently in Sequoia and Kings Canyon National Parks, 507 mountain yellow-legged frog sites are known, most of which occur within 36 different basins that have multiple breeding populations that are hydrologically connected, so that the populations within each basin function as a metapopulation. Fifty-four sites have populations of more than 100 adult mountain yellow-legged frogs, 25 sites have populations between 51 and 100 adults, 132 sites have populations between 10 and 50 adults, and 296 sites have fewer than 10 adults. Of the 507 mountain yellow-legged frog sites in Sequoia and Kings Canyon National Parks, breeding evidence has been found at 259 populations (R. Knapp *in litt.* 2002).

Sequoia National Forest: Jennings and Hayes (1994) indicate that the mountain yellow-legged frog has been extirpated from a number of historical locations in the Sequoia National Forest. Mountain yellow-legged frogs were collected on several historic locations of the Kern Plateau in Sequoia National Forest (Jennings and Hayes 1994). Today, two known extant populations exist on the Sequoia National Forest (S. Anderson, USFS, *in litt.* 2002).

All of the recent mountain yellow-legged frog sightings from the Sequoia National Forest have been of single frogs or very small populations. In 1992, mountain yellow-legged frogs were not detected during amphibian surveys conducted at 17 sites in Sequoia National Forest (Martin 1992). The species appears to be severely reduced in numbers and range in the Sequoia National Forest.

Distinct Vertebrate Population Segment

Under the Act, we must consider for listing any species, subspecies, or, for vertebrates, any distinct population segment (DPS) of these taxa if there is sufficient information to indicate that such action may be warranted. To implement the measures prescribed by the Act, we, along with the National Marine Fisheries Service (National Oceanic and Atmospheric Administration–Fisheries), developed a joint policy that addresses the recognition of DPSs for potential listing actions (61 FR 4722). The policy allows for a more refined application of the Act that better reflects the biological needs of the taxon being considered, and avoids the inclusion of entities that do not require the Act's protective measures.

Under our DPS Policy, we use two elements to assess whether a population segment under consideration for listing may be recognized as a DPS. The elements are: (1) the population segment's discreteness from the remainder of the species to which it belongs; and (2) the significance of the population segment to the species to which it belongs. If we determine that a population segment being considered for listing is a DPS, then the level of threat to the population is evaluated based on the five listing factors established by the Act to determine if listing it as either threatened or endangered is warranted.

Discreteness. Under our DPS Policy, a population segment of a vertebrate species may be considered discrete if it satisfies either one of the following two conditions: (1) it is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation; or (2) it is delimited by international governmental boundaries within which significant differences in control of exploitation, management of habitat, conservation, status, or regulatory mechanisms exist. The proposed DPS, the Sierra Nevada mountain yellow-legged frog, is based on the first condition, the marked separation from other populations.

The range of the mountain yellow-legged frog is divided by a natural geographic barrier, the Tehachapi Mountains, which geographically isolates the populations in the southern Sierra Nevada from those in the mountains of southern California. The distance of the geographic separation is about 225 km (140 mi). The geographic separation of the Sierra Nevada and southern California mountain yellow-legged frogs was recognized in the earliest description of the species by Camp (1917), who treated specimens from the two areas as separate subspecies of *R. boylii*. Camp (1917) described the two subspecies based on differences in their biogeography and morphology.

Ziesmer (1997) analyzed vocalizations of mountain yellow-legged frogs from 86 locations in Alpine and Mariposa counties in the Sierra Nevada, and vocalizations of mountain yellow-legged frogs from 23 locations in the San Jacinto Mountains of Riverside County in southern California. The vocalizations of Sierra Nevada frogs differed from those of southern California frogs in pulse rate, harmonic structure, and dominant frequency. Ziesmer (1997) concluded that the differences in vocalization supported the hypothesis that mountain yellow-legged frogs from the Sierra Nevada and southern California may represent separate species.

Genetic analyses support the discreteness of the mountain yellow-legged frog populations in southern California from those in the Sierra Nevada. In an allozyme (genetic) study that compared mountain yellow-legged frogs from the central Sierra Nevada with those from southern California, a fairly significant genetic difference was found between the two populations (D. Green, McGill University, *in litt.* 1993). However, because there were no frog samples from the southern Sierra Nevada for comparison, it was not clear whether the difference reflected two ends of a cline (a character gradient), or distinctions between the Sierra Nevada and southern California populations. Thus, because the data set was incomplete, Green (*in litt.*, 1993) interpreted the results cautiously.

A phylogenetic analysis of mitochondrial deoxyribonucleic acid (DNA) sequences of the mountain yellow-legged frog was performed throughout its distribution (Macey *et al.* 2001). This study concluded that there are two major genetic lineages of the mountain yellow-legged frog (inclusive of the Sierra Nevada populations and the southern California populations), with populations in the Sierra Nevada falling into three distinct groups and the fourth being the southern California population (Macey *et al.* 2001). Though three genetic lineages of mountain yellow-legged frogs have been identified in the Sierra Nevada, more genetic sampling is needed to delineate specific boundaries of the three genetic lineages before they are treated or managed as separate units (Macey *et al.* 2001). Therefore, this finding treats the three genetic lineages of the mountain yellow-legged frog in the Sierra Nevada as one DPS, discrete from the mountain yellow-legged frog DPS in southern California.

The biogeographic fragmentation within the Sierra Nevada population of mountain yellow-legged frogs occurs between Kings Canyon National Park and a region slightly north of Yosemite National Park, allowing for the central and northern Sierra Nevada populations to share more genetic similarities than the southern Sierra Nevada and southern California populations (Macey *et al.* 2001). In fact, this study indicates that the southern Sierran group (largely in Fresno County) may be more closely related to the southern California mountain yellow-legged frogs than with those in the central and northern Sierra Nevada (Macey *et al.* 2001). This research suggests that the initial divergence between the northern and southern populations of mountain yellow-legged frogs occurred 2.2 million years before present. Within each of these groups, Macey *et al.* (2001) have detected a similar pattern of divergence that suggests the northern Sierra Nevada and central Sierra Nevada mountain yellow-legged frog populations diverged 1.5 million years before present, and the southern Sierra Nevada and the southern California mountain yellow-legged frog populations diverged from each other approximately 1.4 million years before present. Today, these 4 groups are isolated by arid valleys; this isolation is most pronounced between southern California and the southern Sierra Nevada. The biogeographic pattern of genetic divergence as detected in the mountain yellow-legged frogs of the Sierra Nevada has also been observed in four other reptiles and amphibians, suggesting a common event that fragmented their ranges (Macey *et al.* 2001).

Sierran frogs and southern California mountain yellow-legged frogs also differ ecologically in the types of aquatic habitat they occupy. Mountain yellow-legged frogs in southern California are typically found in steep gradient streams, even though they may range into small meadow streams at higher elevations (Zweifel 1955; Mullally 1959). In contrast, Sierran frogs are most abundant in high-elevation lakes and slow-moving portions of streams (Zweifel 1955; Mullally and Cunningham 1956), habitat that is distinct from the canyons of southern California's arid mountain ranges, which are inhabited by the southern California DPS of the mountain yellow-legged frog.

Significance. Under our DPS Policy, once we have determined that a population segment is discrete, we consider its biological and ecological significance to the larger taxon to which it belongs. This consideration may include, but is not limited to: (1) Evidence of the persistence of the discrete population segment in an ecological setting that is unusual or unique for the taxon; (2) evidence that loss of the population segment would result in a significant gap in the range of the taxon; (3) evidence that the population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range; or (4) evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics.

We have found substantial evidence that all but one (there are no introduced populations of mountain yellow-legged frogs outside of its historic range) of these significant factors are met by the population of mountain yellow-legged frogs in the Sierra Nevada. Furthermore, it is significant because a major reduction in abundance of the species as a whole would occur if the Sierra Nevada population were extirpated. The extinction of the Sierra Nevada population of the mountain yellow-legged frog would result in the loss of a genetic entity, a reduction in the geographic range of the species, a loss of the species persistence in a setting ecologically unique relative to the ecological setting of the southern California population, and a reduction in the number of breeding populations. As discussed above, the Sierra Nevada population appears to be genetically distinct from the southern California population of mountain yellow-legged frogs. The mountain yellow-legged frogs of the Sierra Nevada comprise the main distribution of the species at the northern and central limits of the species' range. Loss of the Sierra Nevada population would be significant as it would eliminate the species from the majority of its range and would reduce the species to fewer than 10 small isolated sites in southern California (50 FR 44382). The geographic isolation of the Sierra Nevada population from the mountain yellow-legged frogs in southern California prevents genetic interchange between these populations.

Conclusion. We evaluated the Sierra Nevada population of the mountain yellow-legged frog to determine whether it meets the definition of a DPS, addressing discreteness and significance as required by our policy. We conclude that the Sierra Nevada population of the mountain yellow-legged frog is discrete from the southern California population, on the basis of their geographic separation, differences in vocalization, differences between their habitats, and apparent genetic differences. We conclude that the Sierra Nevada population of the mountain yellow-legged frog is significant because the loss of the species from the Sierra Nevada would result in a significant reduction in the species' range and its population numbers, and would constitute the loss of a genetically discrete population that differs markedly from the southern California population of mountain yellow-legged frogs. Because the population segment meets both the discreteness and significance criteria of our DPS policy, the Sierra Nevada portion of the mountain yellow-legged frog's range qualifies for consideration for listing. An evaluation of the level of threat to the DPS based on the five listing factors established by the Act follows.

Previous Federal Action

On February 10, 2000, we received a petition, dated February 8, 2000, from the Center for Biological Diversity and Pacific Rivers Council to list the Sierra Nevada population of the mountain yellow-legged frog as endangered. The petitioners stated that the Sierra Nevada population of the mountain yellow-legged frog qualifies for listing under our DPS Policy. On October 12, 2000, we published a 90-day finding on that petition in the **Federal Register** (65 FR 60603) concluding that the petition presented substantial scientific or commercial information to indicate that the listing of the Sierra Nevada population of the mountain yellow-legged frog may be warranted; we also requested information and data regarding the species.

This 12-month finding is made in accordance with a court order which requires us to complete a finding by January 10, 2003 (*Center for Biological Diversity and Pacific Rivers Council* v. *Norton and Jones*) (No. C 01–2106 SC). This notice constitutes the 12-month finding for the February 10, 2000, petition.

Summary of Factors Affecting the Species

Section 4 of the Act and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act describe the procedures for adding species to the Federal lists. We may determine a species (which is defined in section 3 of the Act as including any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature) to be endangered or threatened because of one or more of the five factors described in section 4(a)(1) of the Act. These factors, and their application to the Sierra Nevada DPS of the mountain yellow-legged frog (mountain yellow-legged frog), are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* A number of hypotheses, including habitat loss, have been proposed for recent global amphibian declines (Bradford *et al.* 1993; Corn 1994; Alford and Richards 1999). Habitat destruction, however, does not appear to be the primary factor leading to the decline of the mountain yellow-legged frog. The mountain yellow-legged frog occurs at high elevations in the Sierra Nevada, which have not had the types or extent of large-scale habitat conversion and disturbances which have occurred at lower elevations (Bradford *et al.* 1993; Knapp 1996; Knapp and Matthews 2000). Large scale habitat conversion has not been identified within the range of this species; thus, direct habitat destruction or modification associated with intensive human activities, as measured by urban or agricultural land use within the mountain yellow-legged frogs' range, has not been implicated in the decline of this species (Davidson *et al.* 2002). However, other human activities have played a role in the modification of mountain yellow-legged frog habitat. These include livestock grazing, non-native fish introductions (*see* Predation, Factor C, below), timber management, road construction and maintenance, recreation, water diversions, fire management activities, and introduction of environmental contaminants (*see* Other, Factor E, below). These activities have modified habitat in ways that have fragmented and isolated mountain yellow-legged frog populations, and thereby, may have caused or contributed to the decline of this DPS (Bradford *et al.* 1993).

Grazing

Grazing of livestock in Sierra Nevada meadows and riparian areas (aquatic ecosystems and adjacent upland areas that directly affect them) began in the mid-1700s with the European settlement of California (Menke *et al.* 1996). Following the gold rush of the mid-1800s, grazing rose to a level that exceeded the carrying capacity of the available range and caused significant impacts to meadow and riparian ecosystems (Meehan and Platts 1978; Menke *et al.* 1996). From 1870 to 1908, within the range of the mountain yellow-legged frog in the high Sierra Nevada, meadows were converted to summer rangelands for grazing cattle, sheep, horses, goats, and in some areas pigs; however, the alpine areas were mainly grazed by sheep (Beesley 1996; Menke *et al.* 1996). This practice resulted in the degradation of these extremely sensitive areas (Menke *et al.* 1996).

In general, livestock grazing within the range of the mountain yellow-legged frog was at a high but undocumented level until the establishment of national parks (beginning in 1890) and national forests (beginning in 1905). Within established national parks, grazing by cattle and sheep was replaced by that of packstock, such as horses and burros. Within established national forests, the amount of livestock grazing was gradually reduced and better documented, and the types of animals shifted, with reductions in sheep and increases in cattle and packstock. In general, livestock grazing within the national forests has continued with gradual reductions since the 1920s, except for an increase during World War II. Continuing decreases, motivated by concern towards resource protection, conflicts with other uses, and deteriorating range conditions, continued from the 1950s through the early 1970s but still exceeded sustainable grazing capacity in many areas (Menke *et al.* 1996; University of California (UC) 1996a). Grazing management that is more sensitive to riparian areas has been implemented and continues to increase since the 1970s (UC 1996a).

Packstock grazing is the only grazing currently permitted in the Sierra Nevada national parks. Packstock grazing also is permitted in national forests within the Sierra Nevada. However, there has been very little monitoring of the impacts of packstock use in this region (Menke *et al.* 1996). Use of packstock in the Sierra Nevada increased since World War II as a result of increased road access and increases in leisure time and disposable income (Menke *et al.* 1996). Demand for packstock use and recreational riding in the Sierra Nevada are projected to increase as California's human population increases (USFS 2001).

Observational data indicate livestock negatively impact mountain yellow-legged frog populations by altering frog habitat and trampling individuals (R. Knapp, *in litt.* 1993a, 1993b, 1994, 2002; Jennings 1996; A. Carlson, pers. comm. 2002; USFS 2002; V. Vrendenburg, *in litt.* 2002).

Livestock grazing causes changes in wetland systems, including meadows, streams, and ponds; modifies mountain yellow-legged frog habitat by removing overhanging banks that provide shelter; and contributes to the siltation of breeding ponds. Pond siltation may decrease the survivorship of overwintering larvae, subadults, and adult mountain yellow-legged frogs as the overwintering habitats need to be deep enough so that the entire water column does not freeze and underwater caves and crevices are available (Bradford 1983; Pope 1999a).

Grazing of livestock in riparian areas impacts vegetation in multiple ways, including: soil compaction, which increases runoff and decreases water availability to plants; herbage removal, which promotes increased soil temperatures and evaporation rates at the soil surface; and direct physical damage to the vegetation (Kauffman and Krueger 1984; Cole and Landres 1996; Knapp and Matthews 1996). Streamside vegetation protects and stabilizes streambanks by binding soils to resist erosion and to trap sediment (Chaney *et al.* 1990). A study by Kauffman *et al.* (1983) indicated that livestock grazing may have weakened the streambank structure through trampling and removal of vegetation, thereby promoting conditions for erosion. Removal of vegetative cover within mountain yellow-legged frog habitat decreases available habitat, exposes frogs to predation (R. Knapp, *in litt.* 1993b), and increases the threat of dessication (Jennings 1996). Grazing may result in changes to vegetation composition, resulting in an increased density of forested stands and the expansion of trees into areas that were formerly treeless (Cole and Landres 1996).

Livestock grazing can cause a nutrient loading problem due to urination and defecation in or near the water, and can elevate bacteria levels in areas where cattle are concentrated near water (Meehan and Platts 1978; Stephenson and Street 1978; Kauffman and Krueger 1984). The nutrient status of streams can markedly influence the growth of microflora and microfauna and directly and indirectly affect many other characteristics of the stream biota

(Lemly 1998). Growth of filamentous bacteria on the bodies and gills of aquatic insects has been documented in association with nutrient loading in livestock use pastures, along with significantly lower densities of insects at downstream sites. In laboratory and field studies, aquatic insects with this bacterial growth experienced extensive mortality. This indicates that elevated bacteria levels associated with livestock use can negatively influence stream insect populations (Lemley 1998). Adverse effects to aquatic insects within the range of the mountain yellow-legged frog could result in a lowered prey availability, possibly increasing intraspecific competition for limited resources.

Throughout the range of the mountain yellow-legged frog in the Sierra Nevada approximately 79 currently active grazing allotments exist on USFS-administered lands. Of these grazing allotments, at least 29 have extant mountain yellow-legged frog populations within them. An estimated 13 percent of the approximately 210 known mountain yellow-legged frog populations, or populations that function as metapopulations, on Sierra Nevada national forests occur within active grazing allotments. Many of the mountain yellow-legged frog populations in the Sierra Nevada that occur within active grazing allotments are small. These populations may be more vulnerable to extirpation as a result of grazing-induced habitat modification, and if extirpated they might not be recolonized in situations where they are isolated from other populations and lack habitat connectivity to potential source populations.

In the 60-Lakes Basin of Kings Canyon National Park, packstock use is regulated in wet meadows to protect mountain yellow-legged frog breeding habitat in bogs and lakeshores from trampling and associated degradation (V. Vredenburg, *in litt.* 2002; H. Werner, NPS, *in litt.* 2002).

Recreation

Recreation is the fastest growing use of national forests. As such, its impacts on the mountain yellow-legged frog are likely to continue and to increase (USDA 2001). Recreational activities take place throughout the Sierra Nevada and have significant negative impacts on several plant and animal species and their habitats (USDA 2001a). To further recreational opportunities and angling success, non-native trout stocking programs in the Sierra Nevada started in the late 19th Century (Bahls 1992; Pister 2001). Trout stocking throughout the range of the mountain yellow-legged frog has contributed to the decline of this species (see Predation, Factor C, below). The recreational impact of anglers at high mountain lakes has been severe in the Sierra Nevada, with most regions reporting a level of use greater than that which the fragile lakeshore environments can withstand (Bahls 1992).

Recreation may threaten all life stages of the mountain yellow-legged frog through direct disturbance resulting from trampling by humans, packstock, or vehicles, including off-highway vehicles; harassment by pets; and associated habitat degradation (Cole and Landres 1996; USFS 2001). Studies have not been conducted to determine whether recreational activities are contributing to the decline of the mountain yellow-legged frog, and recreation has not been implicated as a cause of major decline of the mountain yellow-legged frog.

Dams and Water Diversions

Dams and water diversions have altered aquatic habitats in the Sierra Nevada (Kondolf *et al.* 1996). Numerous reservoirs have been constructed within the range of the mountain yellow-legged frog. These include Huntington Lake, Florence Lake, Lake Thomas A. Edison, Saddlebag Lake, Convict Lake, Cherry Lake, and other reservoirs associated with Hetch Hetchy, Upper and Lower Blue Lakes, Lake Aloha, Silver Lake, Hell Hole Reservoir, French Meadow Reservoir, Lake Spaulding, and others. The extent of the impacts that these projects have had on the mountain yellow-legged frog is not known. The construction of dams probably has affected mountain yellow-legged frogs in the Sierra Nevada by altering their habitat and movements, and also by altering the distribution of predators (reservoirs are often stocked with non-native fish species that incidentally prey on mountain yellow-legged frogs (See Predation, Factor C, below)). Mountain yellow-legged frogs cannot live in or move through the exposed shorelines created by reservoirs, nor can they successfully reproduce in these environments with predatory fishes unless there are shallow side channels or disjunct pools that are free of predatory fishes (Jennings 1996).

Dams may alter the temperature and sediment load of the rivers they impound (Cole and Landres 1996). Dams, water diversions, and their associated structures can alter the natural flow regime with unseasonal and fluctuating releases of water, create habitat conditions unsuitable for native amphibians both upstream and downstream of dams, and act as barriers to movements by dispersing juvenile and migrating adult amphibians (Jennings 1996). Where dams act as barriers to mountain yellow-legged frog movement, they would effectively prevent genetic exchange between populations and the recolonization of sites. Water diversions that remove water from mountain yellow-legged frog habitat may adversely impact breeding success and adult survivorship if the diversion results in a lowering of the water level to the extent that the entire water column freezes in the winter, or to the extent that the habitat is rendered dry. These factors are likely to have contributed to the decline of mountain yellow-legged frogs and probably continue to pose a risk to the species.

Roads and Timber Harvest

Any activity that severely alters the terrestrial environment, including road construction and timber harvest, is likely to result in the reduction and extirpation of amphibian populations in the Sierra Nevada (Jennings 1996). Most of the mountain yellow-legged frog populations are in areas such as national parks or designated wilderness areas where timber is not harvested (Bradford *et al.* 1994a; Drost and Fellers 1996; Knapp and Matthews 2000). Some of these populations, and others outside of these areas, are located at too high an altitude for timber to be harvested, so this activity is not expected to affect the majority of extant mountain yellow-legged frog populations. There are some mountain yellow-legged frog populations in areas where timber harvests have occurred in the past and others where it may occur in the future. There are also roads within the range of the mountain yellow-legged frog; however, neither of these factors has been implicated as an important contributor to the decline of this species (Jennings 1996).

Fire Management Activities

Mountain yellow-legged frogs are generally found at high elevations in wilderness areas and national parks where vegetation is sparse and fire suppression activities are implemented infrequently. Potential impacts to the species resulting from fire management activities include: Water drafting (taking of water) from occupied ponds and lakes, resulting in direct mortality or rendering the habitat unsuitable for reproduction and survivorship; construction of fuel breaks either by hand or heavy equipment, potentially resulting in erosion and siltation of habitat; fire suppression with water applications or fire retardants; and increased human activity in the area, potentially disrupting mountain yellow-legged frog behavior.

Fire retardant chemicals contain nitrogen compounds and/or surfactants (a subset of chemical additives usually used to facilitate application). Laboratory tests of these chemicals have shown that they can cause mortality in fishes and aquatic invertebrates by releasing surfactants and ammonia when they are added to water (Hamilton *et al.* 1996), and similar effects are likely on amphibians. Therefore, if fire retardant chemicals were dropped in or near mountain yellow-legged frog habitat, they could have negative effects on individuals.

In some areas within the range of the mountain yellow-legged frog, long-term fire suppression has changed forest structure and conditions where fire severity and intensity are higher (McKelvey *et al.* 1996). Prescribed fire has been used by land managers to achieve various silvicultural objectives, including the reduction of fuel loads. In some systems, fire is thought to be important in maintaining open aquatic and riparian habitats for amphibians (Russel *et al.* 1999). But severe and intense wild fires may reduce the ability of amphibians to survive such a fire. However, amphibians display adaptive behavior that may minimize mortality from fire, by taking cover in wet habitats or taking shelter in subterranean burrows, though the moist and permeable skin of amphibians increases their susceptibility to heat and dessication (Russel *et al.* 1999). Neither the direct nor indirect effects of prescribed fire or wildfire on the mountain yellow-legged frog have been studied, but because the species generally occupies high elevation habitat, fire is not a likely risk to this species in much of its range.

In summary, historic grazing activities likely modified the habitat of the mountain yellow-legged frog throughout its range. Although grazing pressure has been significantly reduced from historic levels, grazing may continue to contribute to localized degradation and loss of suitable habitat, negatively affecting mountain yellow-legged frog populations. The effects of recreation, dams, water diversions, roads, timber harvests, and fire management activities on the mountain yellow-legged frog are not well studied, and though they may have negatively affected mountain yellow-legged frogs and their habitat, they have not been implicated as primary factors in the decline of this species (Bradford *et al.* 1993; Bradford *et al.* 1994a; Jennings 1996; Knapp and Matthews 2000). However, recreation, dams, water diversions, roads, timber harvests, and fire management activities may be factors of secondary importance in the decline of the mountain yellow-legged frog and the modification of its habitat (Jennings 1996).

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* There is no known commercial market for mountain yellow-legged frogs, nor are there documented recreational or educational use for mountain yellow-legged frogs, although it is likely that they have been handled by curious members of the public, used as bait by anglers, and collected as pets. The mountain yellow-legged frog does not appear to be particularly popular among amphibian and reptile collectors; however, Federal listing could raise the value of the animals within wildlife trade markets and increase the threat of unauthorized collection above current levels (K. McCloud, Service, pers. comm. 2002). Even limited interest in the species could pose a serious threat to this animal.

Scientific research may cause stress to mountain yellow-legged frogs through disturbance, including disruption of the species' behavior, handling individuals, and injuries associated with marking and tracking individuals. Scientific research has also resulted in the death of numerous individuals through the collection of museum specimens (Zweifel 1955; Jennings and Hays 1994). However, this is a relatively minor threat. Of greater concern are researchers contributing to the spread of pathogens via clothing and sampling equipment as they move between water bodies and populations (Bradford 1991; Bradford *et al.* 1994a; Fellers *et al.* 2001). Given the uncertainty surrounding the potential for researchers to contribute to the spread of pathogens, researchers have begun to implement equipment sterilization procedures between survey sites (H. Eddinger, *in litt.* 2002; R. Knapp, in litt. 2002; V. Vredenburg, in litt. 2002). For further discussion concerning the threat of disease, see Factor C below.

C. *Disease or predation.*

Predation

Native predators of mountain yellow-legged frogs include the mountain garter snake (*Thamnophis elegans elegans*), valley garter snake (*T. sirtalis fitchi*), Brewer's blackbird (*Euphagus cyanocephalus*), Clark's nutcrackers (*Nucifraga columbiana*), coyotes (*Canis latrans*), and black bear (*Ursus americanus*) (Camp 1917; Grinnell and Storer 1924; Mullally and Cunningham 1956; Bradford 1991; Jennings *et al.* 1992; Feldman and Wilkinson 2000; V. Vredenburg *et al.* (in press)).

Predation by introduced trout is the best-documented cause of the decline of the Sierra Nevada mountain yellow-legged frog, because it has been repeatedly observed that non-native fishes and mountain yellow-legged frogs rarely co-exist (Grinnell and Storer 1924; Needham and Vestal 1938; Mullally and Cunningham 1956; Cory 1962a, 1963; Bradford 1989; Bradford and Gordon 1992; Bradford *et al.* 1993, 1994a, 1998; Drost and Fellers 1996; Jennings 1996; Knapp 1996; Knapp and Matthews 2000; Knapp *et al.* 2001; V. Vredenburg *et al.*, (in press); USFS undated). The body of scientific research on the distributions of introduced trout and mountain yellow-legged frogs over time has conclusively demonstrated that introduced trout have negatively impacted mountain yellow-legged frogs over much of the Sierra Nevada (Bradford 1989; Bradford *et al.* 1993, 1994a, 1998; Knapp 1994, 1996; Drost and Fellers 1996; Knapp and Matthews 2000; Knapp *et al.* 2001). Mountain yellow-legged frogs and trout (native and non-native) do co-occur at some sites, but these co-occurrences probably are mountain yellow-legged frog populations that would have negative population growth rates in the absence of immigration (Bradford *et al.* 1998; Knapp and Matthews 2000). Non-native fish stocking programs have been recognized to have negative ecological implications because non-native fish eat native aquatic flora and fauna, including amphibians and invertebrates (Bahls 1992; Erman 1996; Matthews *et al.* 2001; Pilliod and Peterson 2001; Schindler *et al.* 2001; Moyle 2002).

Prior to extensive trout planting programs in the late 19th Century through the present, most streams and lakes in the Sierra Nevada at elevations above 1,800 m (6,000 ft) were without fishes. The distributions of several native fish species occur in lower-elevation aquatic habitats around the Sierra Nevada (Knapp 1996; Moyle *et al.* 1996; Moyle 2002). The only major exception to the 1,800 m (6,000 ft) elevational limit for fishes within the range of the mountain yellow-legged frog in the Sierra Nevada was the upper reaches of the Kern River where native fish such as the Little Kern golden trout (*Oncorhynchus mykiss whitei*) evolved (Moyle 2002). Natural barriers prevented fish from colonizing the higher elevation headwaters of the Sierra Nevada watershed (Moyle *et al.* 1996).

With the Gold Rush and its associated increase in human habitation, habitat alteration, fish distribution and species composition began to change dramatically in high elevation lakes and streams (Moyle *et al.* 1996). Some of the first practitioners of trout stocking in the Sierra Nevada were the Sierra Club, local sportsmen's clubs, private citizens, and the U.S. military (Knapp 1996; Pister 2001). As more hatcheries were built and distribution of non-native fish became better organized under State agency leadership, trout continued to be planted for the purpose of increased angler opportunities and success (Pister 2001). After World War II, the method of transporting trout to be stocked in high elevation areas changed from packstock to aircraft, which allowed stocking in more remote lakes and in greater numbers. It was at this point that CDFG began managing the bulk of the program, as it does today (Knapp 1996; Pister 2001).

Brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), rainbow trout (Oncorhynchus mykiss), and other trout species assemblages have been planted in most streams and lakes of the Sierra Nevada (Knapp 1996; Moyle 2002). National forests in the Sierra Nevada have a higher proportion of lakes with non-native fish occupancy than do national parks (Knapp 1996). This is primarily because the NPS adopted a policy that greatly reduced fish stocking within their jurisdictional boundaries in the late 1970s. Fish stocking was terminated altogether in Sierra Nevada national parks in 1991 (Bahls 1992; Knapp 1996).

Knapp's (1996) review of previous trout distribution estimates and other available data on trout distribution in the Sierra Nevada indicated that approximately 63 percent of lakes larger than 1 ha (2.5 ac) contain one or more non-native trout species, and as many as 85 percent of lakes larger than 1 ha (2.5 ac) within national forests currently contain fish. Lakes larger than 1 ha (2.5 ac) within Sierra Nevada national parks were estimated to have from 35 to 50 percent non-native fish occupancy, a 29 to 44 percent decrease since fish stocking was terminated (Knapp 1996). Though data on fish occupancy in streams is lacking throughout the Sierra Nevada, Knapp (1996) estimated 60 percent of the streams in Yosemite National Park were occupied by trout, despite the curtailment of stocking practices over 25 years ago. Grinnell and Storer (1924) observed that fish stocking in Yosemite National Park "nearly or quite eliminates the (mountain yellow-legged) frogs."

The most spatially comprehensive study of introduced fish and mountain yellow-legged frog distributions included an analysis of large landscapes affected by different fish stocking regimes, watersheds with differing trout distributions, and individual water bodies with varying fauna assemblages (Knapp and Matthews 2000). The Knapp and Matthews (2000) study on the effects of introduced fishes on the mountain yellow-legged frog in the Sierra and Inyo National Forests' John Muir Wilderness indicated 65 percent of water bodies 1 ha (2.5 ac) or larger were stocked with fishes on a regular basis up through the time of the study. Over 90 percent of the total water body surface area in the John Muir Wilderness in the Sierra and Inyo National Forests is occupied by non-native trout (Knapp and Matthews 2000). All fish stocking was terminated in 1977 in the adjacent Kings Canyon National Park. Knapp and Matthews (2000) surveyed all lakes and ponds, more than 1,700 water bodies, for fishes and mountain yellow-legged frogs. They concluded that a strong negative correlation exists between introduced trout and mountain yellow-legged frogs across the landscape, the watersheds, the individual water bodies of the study area, and possibly throughout the Sierra Nevada (Knapp and Matthews 2000). Consistent with this finding are the results of an analysis of the distribution of mountain yellow-legged frog larvae that indicates that the presence and abundance of larvae are reduced dramatically in lakes that have fish as compared with lakes that were never stocked with fish (Knapp *et al.* 2001).

Several aspects of the mountain yellow-legged frog's life history may exacerbate its vulnerability to predation and extirpation by non-native trout (Bradford 1989; Bradford *et al.* 1993; Knapp 1996; Knapp and Matthews 2000). Mountain yellow-legged frogs are aquatic and are found mainly in lakes. This increases the probability that they will encounter non-native fishes whose distribution has been greatly expanded throughout the Sierra Nevada as a result of fish stocking. The multiple-year larval stage of the mountain yellow-legged frog necessitaties their use of permanent water bodies that are deep enough so as not to freeze, and so that overwintering adults can avoid oxygen depletion when the water is covered by ice (Mullally and Cunningham 1956; Bradford 1983; Knapp and Matthews 2000). This further restricts larvae to water bodies suitable for and frequently inhabited by fishes (Knapp 1996) and isolates mountain yellow-legged frogs to fishless marginal habitats (Bradford *et al.* 1993; Knapp and Matthews 2000).

Mountain yellow-legged frog populations have also been extirpated at some fishless bodies of water (Bradford 1991; Drost and Fellers 1996). An explanation suggested for recent mountain yellow-legged frog population declines from fishless waters in the Sierra Nevada is the isolation and fragmentation of remaining populations by introduced fishes in the streams, which once provided the mountain yellow-legged frog with dispersal and recolonization routes (Bradford 1991; Bradford *et al.* 1993). Based on a survey of 95 basins within Sequoia and Kings Canyon National Parks, Bradford *et al.* (1993) calculated that the introduction of fishes into the study area resulted in approximately a ten-fold decrease in hydrologic connectivity between populations of mountain yellow-legged frogs. Knapp and Matthews (2000) believe that this has generally restricted mountain yellow-legged frogs to extremely isolated and marginal habitat. Trout influenced the isolation and fragmentation of mountain yellow-legged frog populations and metapopulations, making them more vulnerable to extirpation from random events (such as disease) than large, unfragmented metapopulations (Wilcox 1980; Hanski and Simberloff 1997; Bradford *et al.* 1993; Knapp and Matthews 2000). Given the metapopulation structure of the mountain yellow-legged frog, these isolated population locations may have higher extinction rates than colonization rates because trout prevent successful recolonization and dispersal to and from these sites (Bradford *et al.* 1993; Blaustein *et al.* 1994a; Knapp and Matthews 2000). In addition, amphibians may not recolonize unoccupied sites following local extinctions because of physiological constraints; the tendency for amphibians, including the mountain yellow-legged frog, to move only short distances; and high site fidelity (Blaustein *et al.* 1994a).

Knapp and Matthews (2000) suggest that the predation of mountain yellow-legged frogs by fishes as observed by Grinnell and Storer (1924), and the documented declines of the 1970s (Bradford 1991; Bradford *et al.* 1994a; Stebbins and Cohen 1995), are not the start of the mountain yellow-legged frog's decline, but rather the end of a long decline that started soon after fish introductions to the Sierra Nevada began in the mid-1800s. Knapp and Matthews (2000) note that metapopulation theory (Hanski 1997) predicts this type of time lag from habitat modification to population extinction.

Fish-induced declines of the mountain yellow-legged frog may be reversed in some locations with an intensive and focused effort to restore fishless conditions (Knapp and Matthews 1998, 2000; Knapp *et al.* 2001). Removing fish from lakes with an adjacent source population of mountain yellow-legged frogs can result in the rapid recolonization of the lake by the species and, over time, may result in recovery to conditions similar to lakes that had never been stocked (Knapp *et al.* 2001; Briggs *et al.* 2002; R. Knapp, *in litt.* 2002). Trout removal from several lakes has been successfully accomplished in the Sierra National Forest's John Muir Wilderness. This has resulted in the natural recolonization and initial recovery of mountain yellow-legged frogs in one of the lakes where trout were removed (R. Knapp, *in litt.* 2002). In the other two lakes within this basin where trout were removed, mountain yellow-legged frogs were successfully reintroduced, and there is evidence of reproduction in these translocated populations (R. Knapp, *in litt.* 2002). Sequoia and Kings Canyon National Parks have initiated a mountain yellow-legged frog restoration project which employs gill nets and electrofishing to remove fish from select lakes and adjacent stream segments at sites with little to no human visitation (NPS 2001). However, because of the cumulative effect of past mountain yellow-legged frog population declines (upwards of 80 percent in the 20th century), and ongoing population declines caused by disease or other factors, the recolonization of lakes restored to fishless conditions will grow less likely as the number of viable source populations of mountain yellow-legged frogs dwindles (Knapp *et al.* 2001).

The best-documented cause of the decline of the mountain yellow-legged frog is the introduction of non-native fish (Bradford 1989; Bradford *et al.* 1993; Knapp and Matthews 2000). In summarizing the effects of non-native fish on the mountain yellow-legged frog, it is important to recognize that: (1) The vast majority of the range of the mountain yellow-legged frog did not evolve with any species of fish as this frog predominantly occurs in water bodies above natural fish barriers; (2) water bodies throughout the range of the mountain yellow-legged frog have been intensively stocked with non-native fish, and where stocking has terminated, self-sustaining fish populations continue to persist; (3) the multiple year larval stage of the mountain yellow-legged frog prevents successful recruitment to populations that co-occur with non-native fish because when water bodies ice over in winter, larvae are forced from shallow margins of lakes and ponds into deeper unfrozen water where they are vulnerable to predation by non-native fish; (4) adult mountain yellow-legged frogs that co-occur with non-native fish are vulnerable to predation when they are exposed to these fish, such as when adult mountain-yellow legged frogs overwinter at the bottom of deep water bodies; and (5) the introduction of non-native fish has fragmented mountain yellow-legged frog habitat, isolated populations from each other, and generally restricted remaining mountain yellow-legged frog populations to marginal habitats, thereby increasing the likelihood of localized extinctions without the possibility of recolonization.

Disease

There have been recent reports from around the globe of disease- and pathogen-related population declines and mass die offs of amphibians (Bradford 1991; Blaustein *et al.* 1994b; Alford and Richards 1999). Mountain yellow-legged frogs are susceptible to diseases such as red-leg disease, caused by the bacterial pathogen *Aeromonas hydrophila.* This pathogen can cause localized population crashes (Bradford 1991). Bradford (1991) suggested that one such outbreak was a result of overcrowding within the mountain yellow-legged frog population. Though it is opportunistic and successfully attacks the immunosuppressed individuals, this pathogen appears to be highly contagious, affecting the epidermis and digestive tract of otherwise healthy amphibians (Shotts 1984; Carey 1993; Carey and Bryant 1995). Grinnell and Storer (1924) reported red-legged disease had infected some mountain yellow-legged frog populations in Yosemite National Park.

In California, chytridiomycosis (*Batrachochytrium dendrobatidis*), more commonly known as chytrid fungus, has been detected in nine amphibian species, including the mountain yellow-legged frog (Fellers and Green, pers. comm., as cited in Briggs *et al.* 2002; R. Knapp, Sierra Nevada Aquatic Research Laboratory, University of California at Santa Barbara, pers. comm. 2002). Fellers *et al.* (2001) report the presence of several bacteria and chytrid fungus in larval and recently metamorphosed mountain yellow-legged frogs from sites within the Sierra Nevada. Chytrid fungus affects the keratinized (horny epidermal tissue) mouth parts and epidermal tissue of larvae and metamorphosed mountain yellow-legged frogs (Fellers *et al.* 2001). Though little is known about its life history in the Sierra Nevada, chytrid fungus has a simple asexual life cycle, and chytrids can generally withstand adverse conditions such as freezing or drought (Briggs *et al.* 2002). A research effort is underway to study the dynamics of this pathogen and the mountain yellow-legged frog within the Sierra Nevada (Briggs *et al.* 2002). Whether adult frogs acquire this fungus from tadpoles or whether the fungus is retained through metamorphosis is unknown. However, the mountain yellow-legged frog may be especially vulnerable to infections of chytrid fungus as all life stages of the mountain yellow-legged frog share the same habitat nearly year round, facilitating the transmission of this fungus to individuals at different life stages within a population (Fellers *et al.* 2001). Survey results from 2000 in Yosemite and Sequoia-Kings Canyon National Parks indicate 24 percent of the mountain yellow-legged frog populations show signs of chytrid infection (Briggs *et al.* 2002). In mountain yellow-legged frogs, chytrid fungus has been observed to result in overwinter mortality and mortality during metamorphosis (Briggs *et al.* 2002). Effects of chytrid fungus on host populations of the mountain yellow-legged frog are variable, ranging from extinction, persistence with a high level of infection, to persistence with low levels of infection (Briggs *et al.* 2002). Studies of the microscopic structure of tissue and other evidence suggests chytrid fungus caused many of the recent extinctions in the Sierra National Forest's John Muir Wilderness Area and in Kings Canyon National Park, where 41 percent of the populations went extinct between 1995 and 2002 (R. Knapp, *in litt.* 2002).

Chytrid fungus affecting wild frog populations was not documented until the late 1990s. Since then, it has been reported in amphibian populations worldwide (Fellers *et al.* 2001). We do not know how long the mountain yellow-legged frog populations have been exposed to chytrid fungus. Red-leg disease is typically a secondary infection following a chytrid infection. If this was also the case in the early 1900s, then it would suggest that what Grinnell and Storer (1924) actually were seeing was chytrid infections (R. Knapp, *in litt.* 2002). During a visual examination of mountain yellow-legged frog tadpoles preserved between 1993 and 1999, abnormalities attributed to the chytrid fungus were detected on 14 of 36 specimens and no abnormalities were detected on any of the 43 tadpole specimens collected between 1955 and 1976 (Fellers *et al.* 2001). This indicates that chytrid fungus infections may be a recent pathogen to affect the mountain yellow-legged frog, although visual detections of chytrid-like abnormalities may be neither longlasting nor attributable to this fungus (Fellers *et al.* 2001; V. Vredenburg, *in litt.* 2002). Since at least 1976, chytrid fungus has affected adult Yosemite toads (Green and Kagarise Sherman 2001). The Yosemite toad is sympatric with the mountain yellow-legged frog (their ranges overlap). Therefore, it is possible that this pathogen has affected both of these amphibian species since at least the mid-1970s. Chytrid fungus is only a recently detected pathogen in amphibian populations; this may be an emerging infectious disease. How it has been transmitted to the mountain yellow-legged frog is unclear (Briggs *et al.* 2002).

Saprolegnia is a globally distributed fungus that commonly attacks all life stages of fishes (especially hatchery reared fishes), and has recently been documented to attack and kill egg masses of western toads (*Bufo boreas*) (Blaustein *et al.* 1994b). This pathogen may be introduced through fish stocking or it may already be established in the aquatic ecosystem. Fishes and/or migrating or dispersing amphibians may be a vector for this fungus (Blaustein *et al.* 1994b; Kiesecker *et al.* 2001). *Saprolegnia* has not been reported in the mountain yellow-legged frog; however, if hatchery fishes are vectors of this disease, it may have been introduced via fish stocking into historically occupied mountain yellow-legged frog habitat.

No viruses were detected in the specimens of mountain yellow-legged frogs that Fellers *et al.* (2001) analyzed for chytrid fungus. In Kings Canyon National Park, Knapp (pers. comm. 2002) found mountain yellow-legged frogs showing symptoms preliminarily attributed to a ranavirus. Mechanisms for disease transmission, including viruses, to the mountain yellow-legged frog remain unknown. However, Mao *et al.* (1999) isolated identical iridoviruses from wild co-occurring populations of the threespine stickleback (*Gasterostelus aculeatus*) and the red-legged frog (*Rana aurora*), indicating that infection by a given virus is not limited to a single species, and that iridoviruses can infect animals belonging to different taxonomic classes. This suggests that if virus-hosting trout are introduced into mountain yellow-legged frog habitat, they may be a vector of amphibian viruses.

Whether amphibian pathogens in the high Sierra Nevada have always coexisted with amphibian populations or if their presence is a recent phenomenon is uncertain (Fellers *et al.* 2001). The susceptibility of amphibians to pathogens may have recently increased in response to anthropogenic (human-caused) environmental disruption (Carey 1993; Blaustein *et al.* 1994b; Carey *et al.* 1999). This hypothesis suggests that environmental changes may be indirectly responsible for certain amphibian dieoffs by immune system suppression of larval or postmetamorphic amphibians to the extent that they are not resistant to diseases (Carey 1993; Blaustein *et al.* 1994b; Carey *et al.* 1999). Pathogens such as red-leg disease, which are present in fresh water and in healthy organisms, may erupt, potentially causing localized amphibian population dieoffs when the immune system of individuals within the host population are suppressed (Carey 1993; Carey and Bryant 1995). Wind-borne pesticides from upwind agriculture potentially contribute to contaminant concentrations that may be high enough to compromise amphibian immune systems (Carey 1993; Carey *et al.* 1999; Daszak *et al.* 1999). Recreationists may contribute to the spread of pathogens between water bodies and populations via clothing and fishing equipment. Given the uncertainty surrounding the potential for researchers to contribute to the spread of pathogens, they have begun to implement equipment sterilization procedures between survey sites (H. Eddinger, *in litt.* 2002; R. Knapp, *in litt.* 2002; V. Vredenburg, *in litt.* 2002).

A compounding effect of disease-caused extinctions of mountain yellow-legged frogs is that recolonization may never occur, because streams connecting extirpated sites to extant populations now contain introduced fishes, which act as barriers to frog movement within metapopulations. This isolates the remaining populations of mountain yellow-legged frogs from each other (Bradford 1991; Bradford *et al.* 1993).

In summary, mountain yellow-legged frogs are vulnerable to multiple pathogens, whose effects range from population persistence, with low levels of infection within populations, to extinction of entire populations. Little is understood about these pathogens, making disease difficult to manage without a better understanding of their life histories and modes of transmission. Red-leg disease and chytrid fungus have been identified as having potentially catastrophic effects (localized extinction) on mountain yellow-legged frog populations. Though chytrid fungus was only recently discovered to affect amphibians (including the mountain yellow-legged frog), chytrid currently appears to have the highest rate of infection relative to other pathogens in mountain yellow-legged frog populations. The negative consequences of chytrid infection to mountain yellow-legged frog populations may be exacerbated by the fragmentation and isolation of remaining mountain yellow-legged frog metapopulations and populations due to non-native fish introductions. This is because there may not be an adjacent mountain yellow-legged frog population with habitat connectivity that is able to recolonize an area following a pathogen-caused extinction event.

D. *The inadequacy of existing regulatory mechanisms.* Existing regulatory mechanisms that could provide some protection for the mountain yellow-legged frog in the Sierra Nevada include: (1) Federal laws and regulations; (2) State laws and regulations; and (3) local land use processes and ordinances. However, these regulatory mechanisms have not prevented non-native fish introductions, pathogen outbreaks, and habitat modifications, all of which result in population declines of mountain yellow-legged frogs in the Sierra Nevada.

Federal

In response to the overgrazing by livestock of the available rangelands from the 1800s to the 1930s and the subsequent years of the Dust Bowl, Congress passed the Taylor Grazing Act in 1934. This was an effort to stop the damage to the remaining public lands from overgrazing and soil depletion, to provide for an order to grazing on public lands, and to attempt to stabilize the livestock industry using these lands (Meehan and Platts 1978; *Public Lands Council et al.* v. *Babbitt Secretary of the Interior et al.* (167 F. 3d 1287)). Although passage of the Taylor Grazing Act resulted in reduced grazing in some areas, it did not reduce grazing severity, as use remained high, and it did not allow regeneration of many meadow areas (Beesley 1996; Menke *et al.* 1996; *Public Lands Council et al.* v. *Babbitt Secretary of the Interior et al.* (167 F. 3d 1287)). The Taylor Grazing Act of 1934, as amended, did initiate some grazing reform, possibly lessening impacts of livestock grazing on many species and populations of wild plants and animals, including the mountain yellow-legged frog and its habitat. However, it does not have any provisions specific to the protection of either the mountain yellow-legged frog or its habitat.

The Multiple-Use Sustained-Yield Act of 1960 (MUSY), as amended, provided direction that the national forests be managed using principles of multiple use and to produce a sustained yield of products and services. Specifically, MUSY gives policy that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, wildlife, and fish purposes. Land management for multiple uses has inherent conflicts. However, MUSY directs resource management not to impair the productivity of the land while giving consideration to the relative values of the various resources, though not necessarily in terms of the greatest financial return or unit output. This act provides direction to the USFS that wildlife (which includes the mountain yellow-legged frog), is a value that must be managed for, though discretion is given to each national forest when considering the value of the mountain yellow-legged frog relative to the other uses for which they must manage. MUSY does not have any provisions specific to the protection of either the mountain yellow-legged frog or its habitat.

The Federal Land Policy and Management Act of 1976 (FLPMA), as amended, gives management direction to the Bureau of Land Management; however, its application is to all Federal lands, including those managed by the USFS. FLPMA includes a provision requiring that 50 percent or $10,000,000 per year, whichever is greater, of all moneys received through grazing fees collected on Federal lands (including the USFS-administered lands within the range of the mountain yellow-legged frog) be spent for the purpose of on-the-ground range rehabilitation, protection, and improvement. This includes all forms of rangeland betterment such as fence construction, water development, and fish and wildlife enhancement. Half of the appropriated amount must be spent within the national forest where such moneys were derived. FLPMA provides for some rangeland improvements intended for the long-term betterment of forage conditions and resulting benefits to wildlife, watershed protection, and livestock production. Land improvements initiated pursuant to FLPMA may have benefitted the mountain yellow-legged frog and its habitat; however, some mountain yellow-legged frog habitat has continued to be destabilized and deteriorate due to livestock grazing on lands subject to FLPMA (R. Knapp, *in litt.* 1993a, 1993b, 1994, 2002; Jennings 1995, 1996). We are unaware of any USFS-initiated projects developed under FLPMA for the specific benefit of the mountain yellow-legged frog, and, if the USFS has conducted such projects, what effects they have had.

The Wilderness Act of 1964 established a National Wilderness Preservation System made up of federally owned areas designated by Congress as ''wilderness'' for the purpose of preserving and protecting designated areas in their natural condition. Commercial enterprise, road construction, use of motorized vehicles or other equipment, and structural developments are generally prohibited within designated wilderness. Livestock grazing is permitted within designated wilderness, subject to other applicable laws, if it was established prior to the passage of this act. The Wilderness Act does not specifically mention fish stocking although it does state that it shall not affect the jurisdiction or responsibilities of States with wildlife and fish responsibilities in the national forests. Whether fish stocking is permitted under the Wilderness Act is an issue that has been debated (Bahls 1992; Landres *et al.* 2001). However, it generally has not limited fish stocking in the Sierra Nevada (Knapp 1996). Passage of the Wilderness Act has not positively affected mountain yellow-legged frog populations in wilderness areas of the Sierra Nevada as it does not prevent fish stocking (Knapp and Matthews 2000). Potentially, the Wilderness Act has helped to protect mountain yellow-legged frog habitat from development or other types of habitat conversions and disturbances; however, mountain yellow-legged frog populations have continued to decline despite its passage.

The National Environmental Policy Act of 1969 (NEPA), as amended, requires all Federal agencies to formally document and publicly disclose the environmental impacts of all actions and management decisions. NEPA documentation is provided in either an environmental impact statement, an environmental assessment, or a categorical exclusion, and may be subject to administrative appeal or litigation. The Pacific Southwest Region (Region 5) of the USFS considers the mountain yellow-legged frog a Forest Service sensitive species. Therefore, as part of USFS policy, the analysis related to planning under the National Forest Management Act of 1976 (NFMA) and conducted by the USFS to evaluate potential management decisions under NEPA includes a biological evaluation which discloses potential impacts to sensitive species at both the forest planning level and on a project-by-project basis. Under USFS policy (FSM 2620 and 2670), projects must not result in contributing to a trend towards Federal listing of species. Despite the analyses pursuant to NEPA on all Federal actions potentially affecting the mountain yellow-legged frog in the Sierra Nevada, and analyses pursuant to both NFMA and NEPA on national forests, the species' populations have continued to decline (Bradford *et al.* 1993, 1994a; Drost and Fellers 1996; Jennings 1996; Knapp 1996).

The revised NMFA planning regulations recently proposed by the USFS (67 FR 72770) may affect the status of this policy requirement (FSM 2620 and 2670), as the underlying regulatory framework pertaining to providing for the diversity of plant and animal communities is proposed to be substantially altered from the existing regulatory requirement. The outcome of both the regulations and the related policies that tier to them is uncertain.

In the few cases where the Sierra Nevada mountain yellow-legged frog occurs in habitat occupied by species listed pursuant to the Act, the mountain yellow-legged frog may be afforded protection under this legislation. The native Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) and native Paiute cutthroat trout (*Oncorhynchus clarki seleneris*) are federally listed species, occurring predominantly in drainages on the east side of the Sierra Nevada. They co-occur with several small populations of mountain yellow-legged frogs at lower elevations on the edge of the species' range. The native Little Kern golden trout is a federally threatened species, co-occurring with the mountain yellow-legged frog in a few isolated locations in the southern Sierra Nevada (Knapp 1996; Moyle 2002). Recovery actions for these trout species, such as physical habitat protection, may benefit the mountain yellow-legged frog. For example, on the Tahoe National Forest, grazing, recreation, and other restrictions for the benefit of the Lahontan cutthroat trout and its habitat have been established. One of these measures that benefits the mountain yellow-legged frog is the establishment of a bank protection measure that allows for 10 percent bank disturbance (measured as bare ground accompanied by soil displacement and/or cutting of plant root crowns). Elsewhere the standard for bank disturbance is 20 percent (A. Carlson, *in litt.* 2002). However, the use of chemicals or electrofishing to remove non-native fish from threatened trout habitat may adversely affect mountain yellow-legged frogs present at the time of treatment. Additionally, listed native trout species may prey on the mountain yellow-legged frog at sites where they co-occur.

The Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by NFMA, specifies that all national forests must have a land and resource management plan (LRMP). The purpose of the LRMP is to guide and set standards for all natural resource management activities for the life of the plan (10 to 15 years) on each national forest. NFMA requires the USFS to incorporate standards and guidelines into LRMPs. This has historically been done through a NEPA process, including provisions to manage plant and animal communities for diversity, based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives. The 1982 planning regulations for implementing NFMA, under which all existing forest plans were prepared and which still guide management, also required that fish and wildlife habitat on national forest system lands ''* * * shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. For planning purposes, a viable population is one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable population will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area.''

In 2001, a record of decision (ROD) was signed by the USFS for the Sierra Nevada Forest Plan Amendment (SNFPA), based on the final environmental impact statement (FEIS) for the SNFPA effort and prepared under the 1982 NFMA planning regulations. The ROD amends the USFS Pacific Southwest Regional Guide, the Intermountain Regional Guide, and the LRMPs for national forests in the Sierra Nevada and Modoc Plateau. This document affects land management on all national forests throughout the range of the mountain yellow-legged frog. The SNFPA addresses and gives management direction on issues pertaining to old forest ecosystems; aquatic, riparian, and meadow ecosystems; fire and fuels; noxious weeds; and lower westside hardwood ecosystems of the Sierra Nevada.

Relevant to the mountain yellow-legged frog, the ROD for the SNFPA aims to protect and restore aquatic, riparian, and meadow ecosystems, and to provide for the viability of its associated native species via an aquatic management strategy. The aquatic management strategy is a general framework with broad policy direction. Implementation of this strategy is intended to take place at the landscape and project levels. There are nine goals associated with the aquatic management strategy. They include: (1) The maintenance and restoration of water quality to comply with the Clean Water Act (CWA) and the Safe Drinking Water Act; (2) the maintenance and restoration of habitat to support viable populations of native and desired non-native riparian-dependent species and to reduce negative impacts of non-native species on native populations; (3) the maintenance and restoration of species diversity in riparian areas, wetlands, and meadows to provide desired habitats and ecological functions; (4) the maintenance and restoration of the distribution and function of biotic communities and biological diversity in special aquatic habitats (such as springs, seeps, vernal pools, fens, bogs, and marshes); (5) the maintenance and restoration of spatial and temporal connectivity for aquatic and riparian species within and between watersheds to provide physically, chemically, and biologically unobstructed movement for their survival, migration, and reproduction; (6) the maintenance and restoration of hydrologic connectivity between floodplains, channels, and water tables to distribute flood flows and to sustain diverse habitats; (7) the maintenance and restoration of watershed conditions as measured by favorable infiltration characteristics of soils and diverse vegetation cover to absorb and filter precipitation, and to sustain favorable conditions of stream flows; (8) the maintenance and restoration of instream flows sufficient to sustain desired conditions of riparian, aquatic, wetland, and meadow habitats and to keep sediment regimes within the natural range of variability; and (9) the maintenance and restoration of the physical structure and condition of stream banks and shorelines to minimize erosion and sustain desired habitat diversity. If these goals are pursued and met, the mountain yellow-legged frog and its habitat could benefit. These goals, though broadly stated, include measures to reduce impacts of non-native trout predation on mountain yellow-legged frogs as well as the resulting isolation of populations. These goals, if met, would also restore mountain yellow-legged frog aquatic habitats, including meadows, fens, stream banks, and shorelines that have been degraded by a history of livestock use.

To help meet these goals, the aquatic management strategy proposes a broad initial action to address the mountain yellow-legged frog in a conservation plan developed by the *USFS* with other State and Federal agencies; an effort by the USFS to do this is underway. Where known locations of mountain yellow-legged frogs occur on the national forests, critical aquatic refuges will be designated. A primary management goal for the critical aquatic refuges is to contribute to the viability and recovery of sensitive species (including the mountain yellow-legged frog) through habitat preservation, enhancement, restoration, or connectivity. Within the aquatic management strategy, critical aquatic refuges are given highest priority for evaluating how existing and proposed activities are consistent with the goals of the strategy. The aquatic management strategy directs existing and proposed activities within critical aquatic refuges to be consistent with the goals of the critical aquatic refuges. This evaluation will be made using the riparian conservation objectives and associated standards and guidelines, as defined in the ROD for the SNFPA. One such standard and guideline specific to the mountain yellow-legged frog includes the avoidance of pesticide applications from within 152 m (500 ft) of sites known to be occupied by the species.

Management standards and guidelines in the SNFPA ROD for the Yosemite toad will also benefit the mountain yellow-legged frog in areas where these two species overlap. These standards and guidelines exclude livestock from standing water and saturated soils in wet meadows and associated streams and springs occupied by Yosemite toads, or identified as essential habitat for this species in the USFS's conservation assessment for this species.

The SNFPA includes requirements for monitoring to determine how well the aquatic management strategy goals and the riparian conservation objectives have been met, and how closely management standards and guidelines have been applied.

Our review of the SNFPA FEIS and ROD indicate that full implementation of the SNFPA would benefit the mountain yellow-legged frog and its habitat. National forests affected by the SNFPA are responsible for implementing it; however, implementation is subject to funding. Also, current direction from within the USFS is to internally review the entire record (including the FEIS, the existing

ROD, public and agency comments, and the appeals and responsive statements), to evaluate primarily the effects of its implementation on grazing, recreation, and impacts to local communities (J. Blackwell, USFS, *in litt.* 2001). This review and assessment may result in proposed changes to the SNFPA and its associated documents. Therefore, the extent to which it will continue to be implemented, and the extent to which it may benefit the mountain yellow-legged frog and its habitat, remain undetermined. There is additional uncertainty because the proposed changes to the NFMA planning regulations recently issued by Forest Service (67 FR 72770) contain two options for meeting the NFMA direction to provide for the diversity of plant and animal communities, and both options would change the current regulation pertaining to forest planning to provide habitat to support viable populations.

The statute establishing the National Park Service, commonly referred to as the National Park Service Organic Act (39 Stat. 535; 16 U.S.C. 1,2,3 and 4) states that the NPS will administer areas under their jurisdiction ''. . .by such means and measures as conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.'' The 2001 edition of NPS Management Policies (NPS D1416) further elaborates on how impacts on park resources, including native organisms, will not be allowed to the level that they would constitute impairment: ''To comply with this mandate, park managers must determine in writing whether proposed activities in parks would impair natural resources. Park managers must also take action to ensure that ongoing NPS activities do not cause impairment. In cases of doubt as to the impact of activities on park natural resource, the Service will decide in favor of protecting the natural resources.'' Sequoia, Kings Canyon, and Yosemite National Parks began phasing out fish stocking in 1969 and terminated this practice entirely in 1991 (Bahls 1992; Knapp 1996).

Under section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (Corps) regulates the discharge of fill material into waters of the United States, including wetlands. Section 404 regulations require applicants to obtain a permit for projects that involve the discharge of fill material into waters of the United States, including wetlands. Projects that are subject to regulation may qualify for authorization to place fill material into headwaters and isolated waters, including wetlands, under several nationwide permits. The use of nationwide permits by an applicant or project proponent is normally authorized with minimal environmental review by the Corps. An individual permit may be required by the Corps if a project otherwise qualifying under a nationwide permit would have greater than minimal adverse environmental impacts. However, few projects that include fill of wetlands are likely to occur within the range of the mountain yellow-legged frog.

State

The State of California considers the mountain yellow-legged frog a species of special concern, but it is not State listed as a threatened or endangered species and thus is not protected under the California Endangered Species Act.

California Sport Fishing Regulations include the mountain yellow-legged frog as a protected species that may not be taken or possessed at any time with a sport fishing license. Possession or take of the mountain yellow-legged frog is authorized under special permit from the CDFG. This gives the frog some legal protection from collecting, but does not protect it from other causes of mortality or alterations to its habitat.

The California Forest Practice rules set guidelines for the design of timber harvests on private land to reduce impacts on non-listed species. These rules have little application to the protection of the mountain yellow-legged frog because the vast majority of the species' range is on Federal land, and much of its range is too high in elevation to overlap with lands used for commercial timber harvest.

The California Department of Pesticide Regulation (CDPR) has authority to restrict the use of pesticides. The CDPR Toxic Air Contaminant (TAC) Program includes assessment of the risks posed by airborne pesticides; this assessment involves collection of air samples near sites of pesticide application and in communities near those sites. If air samples indicate that reductions in exposure are needed, mitigation measures are developed to bring about those reductions (CDPR 2001). However, the TAC program is intended primarily to protect human health, and air samples are not taken at far distant locations from application sites, like those inhabited by the mountain yellow-legged frog in the Sierra Nevada.

The California Environmental Quality Act (CEQA) pertains to projects on non-Federal lands and requires review of any project that is undertaken, funded, or permitted by a State or local governmental agency. If a project with potential impacts on the mountain yellow-legged frog in the Sierra Nevada is reviewed, CDFG personnel could determine that, although not state-listed, the frog is *de facto* an endangered, threatened, or rare species under section 15380 of CEQA. Once significant effects are identified, the lead agency has the option of requiring mitigation for effects through changes in the project or to decide that overriding considerations make mitigation infeasible (CEQA Sec. 21002). In the latter case, projects may be approved that cause significant environmental damage, such as destruction of state-listed endangered species or their habitat. Protection of listed species through CEQA is, therefore, dependent on the discretion of the agency involved. In addition, fish stocking is not subject to disclosure of its potential environmental impacts because it is exempt from CEQA under Article 19 section 15301(j). Therefore, the effects of fish stocking on the mountain yellow-legged frog are not analyzed pursuant to CEQA. Also, the vast majority of the species' range is on Federal land and is affected by Federal actions (other than the State-sponsored fish stocking) that are not subject to CEQA analysis.

Section 1603(a) of the California Fish and Game Code requires a permit from the CDFG for any activity that may alter the bed, channel, or bank of any river, stream, or lake. The permit may incorporate measures to minimize adverse impacts to fish and wildlife. Therefore, this regulation may offer some protection of mountain yellow-legged frog habitat. The extent to which this regulation has provided the mountain yellow-legged frog with protection is unknown because much of the range of this species is on federal lands where few habitat modifications subject to this permit are proposed.

The CDFG is practicing an informal policy on fish stocking in the range of the mountain yellow-legged frog in the Sierra Nevada. This policy directs that: (1) Fish will not be stocked in lakes with known populations of mountain yellow-legged frogs, nor in lakes which have not yet been surveyed for mountain yellow-legged frog presence; (2) waters will be stocked only with a fisheries management justification; and (3) the number of stocked lakes will be reduced over time. In 2001, the number of lakes stocked with fish within the range of the mountain yellow-legged frog in the Sierra Nevada was reduced by 75 percent (C. Milliron, *in litt.* 2002; E. Pert, CDFG, pers. comm. 2002; E. Pert *et al.*, pers. comm. 2002). Water bodies within the same basin and 2 km (1.25 mi) from a known mountain yellow-legged frog population will not be stocked with fish unless stocking is justified through a management plan that considers all the aquatic resources in the basin, or unless there is heavy angler use and no opportunity to improve the mountain yellow-legged frog habitat (C. Milliron, *in litt.* 2002). This policy has not been finalized in writing (E. Pert *et al.*, pers. comm. 2002).

The CDFG is in the process of developing management plans for basins within the range of the mountain yellow-legged frog in the Sierra Nevada (CDFG 2001; C. Milliron, *in litt.* 2002; E. Pert, pers. comm. 2002; E. Pert *et al.*, pers. comm. 2002). For example, a plan has been developed, signed, and initiated for the Big Pine Creek wilderness basin in the Inyo National Forest's John Muir Wilderness (CDFG 2001), and a similar plan is proposed for the Gable Lakes basin, also in the John Muir Wilderness area of the Inyo National Forest (B. Miller, CDFG, *in litt.* 2001). The objectives of the Big Pine Creek wilderness basin plan specific to the mountain yellow-legged frog include management in a manner that maintains or restores native biodiversity and habitat quality, supports viable populations of native species, and provides for recreational opportunities that consider historic use patterns (CDFG 2001). Under this plan, some lakes are managed primarily for the mountain yellow-legged frog, with few or no angling opportunities, while lakes with high demand for recreational angling are managed primarily for that purpose (CDFG 2001). Preliminary results indicate that where the plans are being implemented, the management objective to restore mountain yellow-legged frog habitat is being achieved, and in some areas, mountain yellow-legged frog populations have responded positively (C. Milliron, pers. comm. 2002). We anticipate that the development and implementation of these basin management plans will be effective in reversing some of the negative impacts of introduced trout on mountain yellow-legged frog populations within a limited geographic area of the affected basins, providing that connectivity is restored between and within metapopulations.

Local

We are not aware of any specific county or city ordinances that provide protection for the Sierra Nevada population of mountain yellow-legged frogs.

E. *Other natural or manmade factors affecting its continued existence.* Several other natural or anthropogenically influenced factors, including contaminants, acid precipitation, climate change and drought, and ambient ultraviolet radiation, have been implicated as a cause of amphibian declines (Corn 1994; Alford and Richards 1999). These factors have been studied to varying degrees specific to the mountain yellow-legged frog. These factors are discussed below.

The following factors make the mountain yellow-legged frog, along with other amphibians, sensitive to environmental change or degradation: its aquatic and terrestrial phases; its highly permeable skin which is exposed to substances in the water, air, and terrestrial substrate; and the position at which it feeds on the food web, depending on its life stage (Blaustein and Wake 1990, 1995; Bradford and Gordon 1992; Stebbins and Cohen 1995). Environmental contaminants have been suggested, and in some cases documented, to negatively affect amphibians by causing the following: direct mortality (Hall and Henry 1992; Berrill *et al.* 1994, 1995; Carey and Bryant 1995; Relyea and Mills 2001); immune system suppression, which makes amphibians more vulnerable to disease (Carey 1993; Carey and Bryant 1995; Carey *et al.* 1999; Daszak *et al.* 1999; Taylor *et al.* 1999); disruption of breeding behavior and physiology (Berrill *et al.* 1994; Carey and Bryant 1995, Hayes *et al.* 2002); disruption of growth or development (Hall and Henry 1992; Berrill *et al.* 1993, 1994, 1995, 1998; Carey and Bryant 1995; Sparling *et al.* 2001); and disruption of the ability to avoid predation (Hall and Henry 1992; Berrill *et al.* 1993, 1994, 1995, 1998; Carey and Bryant 1995; Relyea and Mills 2001; Sparling *et al.* 2001).

Wind-borne pesticides and the compounds that carry pesticides from upwind agriculture that are deposited in the Sierra Nevada have been suggested as a cause of measured sublethal effects to amphibians (Cory *et al.* 1971; Davidson *et al.* 2001; Sparling *et al.* 2001). In 1998, more than 97 million kilograms (215 million pounds) of pesticides reported to be used in California (CDPR 1998). Originating from the agriculture in California's Central Valley, and mainly from the San Joaquin Valley where agricultural activity is greatest, pesticides are passively transported eastward to the high Sierra Nevada where they have been detected in precipitation (rain and snow), air, dry deposition, surface water, plants, fish, and amphibians, including Pacific tree frogs and mountain yellow-legged frogs (Cory *et al.* 1970; Zabik and Seiber 1993; Aston and Seiber 1997; Datta *et al.* 1998; McConnell *et al.* 1998; LeNoir *et al.*1999; Sparling *et al.* 2001; Angermann *et al.* 2002). Angermann *et al.* (2002) detected elevated contaminant (polychlorinated biphenyls and toxaphene) levels in Pacific tree frog larvae within the range of the mountain yellow-legged frog, and suggested that these contaminants originate in California's Central Valley and metropolitan areas. Spatial analysis of populations of the California red-legged frog (*Rana aurora draytonii*), foothill yellow-legged frog, Cascades frog (*R. cascadae*), and the mountain yellow-legged frog in the Sierra Nevada showed a strong, statistically significant pattern of population decline associated with greater amounts of upwind agriculture (Davidson *et al.* 2002).

Cholinesterase is an enzyme that functions in the nervous system and is disrupted by organophosphorus pesticides, including malathion, chlorpyrifos, and diazinon (Sparling *et al.* 2001). Reduced cholinesterase activity and pesticide residues have been found in Pacific treefrog larvae collected in the Sierra Nevada downwind of the Central Valley (Sparling *et al.* 2001). Cholinesterase activity was significantly lower in samples from the Sierra Nevada than in samples taken from coastal California, upwind of the Central Valley. No samples were taken above approximately 1,500 m (4,900 ft) elevation (Sparling *et al.* 2001), so in this study there is limited overlap with the 1,370 to 3,650 m (4,500 to 12,000 ft) elevational range (Stebbins 1985) of mountain yellow-legged frogs. Although pesticide detections decrease with altitudinal gain, they have been detected at elevations in excess of 3,200 m (10,500 ft) (Zabik and Seiber 1993; Aston and Seiber 1997; McConnell *et al.* 1998; LeNoir *et al.* 1999; Angermann *et al.* 2002). In addition to interfering with nerve function, contaminants such as industrial and agricultural chemicals may act as estrogen mimics (Jobling *et al.* 1996), causing abnormalities in amphibian reproduction and disrupting endocrine functions (Carey and Bryant 1995; Stebbins and Cohen 1995; Jobling *et al.* 1996; Hayes *et al.* 2002), thereby having a negative effect on amphibian populations, including the mountain yellow-legged frog.

In the late 1960s, dichlorodiphenyltrichloroethane (DDT) and its residues were detected in significant quantities in mountain yellow-legged frogs and foothill yellow-legged frogs throughout the Sierra Nevada up to an elevation of 3,660 m (12,000 ft) (Cory *et al.* 1970). The origin of this DDT is primarily attributed to agriculture in the Central Valley (Cory *et al.* 1970). DDT residues likely from agriculture in the Central Valley still appeared in Pacific treefrog larvae collected in the Sierra Nevada in the late 1990s (Sparling *et al.* 2001), more than 25 years after the use of DDT was banned in the United States. Levels of this toxicant in the mountain yellow-legged frog and foothill yellow-legged frog were significantly higher in the central Sierra Nevada, from the Tuolumne Meadows area of Yosemite National Park, north to Sonora Pass in the Stanislaus National Forest. The origin of DDT at these locations is attributed to two massive applications administered directly to this national forest and national park for pest control (Cory *et al.* 1970, 1971).

Snow core samples from the Sierra Nevada contain a variety of contaminants from industrial and automotive sources, including hydrogen ions that are indicative of acidic precipitation, nitrogen and sulfur compounds (NH_4, NO_3, SO_2, and SO_4), and heavy metals (lead, iron, manganese, copper, and cadmium) (Laird *et al.* 1986). The pattern of recent frog extinctions in the southern Sierra Nevada corresponds with the pattern of highest concentration of air pollutants from automotive exhaust, possibly due to increases in nitrification (or other changes), caused by those pollutants (Jennings 1996). The effects of contaminants on amphibians need further research (Hall and Henry 1992; Briggs *et al.* 2002). However, the correlative evidence between areas of pesticide contamination in the Sierra Nevada and areas of amphibian decline, along with evidence of an adverse physiological effect from pesticides on amphibians in the Sierra Nevada, indicates that contaminants may present a risk to the mountain yellow-legged frog and may have contributed to the species' decline (Jennings 1996; Sparling *et al.* 2001; (Davidson *et al.*, 2002).

It has been suggested that contamination from wind-borne pesticides originating from upwind agriculture, and other contaminants originating from metropolitan areas, may compromise amphibian immune systems (Carey 1993; Carey *et al.* 1999; Daszak *et al.* 1999; Angermann *et al.* 2002). An effort to test the hypothesis that contaminants originating in the San Joaquin Valley are suppressing the mountain yellow-legged frog's immune system, thereby making it more vulnerable to disease, is underway (Briggs *et al.* 2002).

Laboratory studies have documented sublethal effects on mountain yellow-legged frog embryos at pH 5.25 (pH represents acidity on a negative scale, with 7 being neutral and lower numbers indicating increased acidity). Survivorship of mountain yellow-legged frog embryos and tadpoles was negatively affected as acidity increased (at approximately pH 4.5 or lower), with embryos being more sensitive to increased acidity than tadpoles (Bradford and Gordon 1992; Bradford *et al.* 1992). Acidic deposition has been suggested as contributing to amphibian declines in the western United States (Blaustein and Wake 1990; Carey 1993; Alford and Richards 1999). Other studies, however, do not support this hypothesis as a contributing factor to amphibian population declines in this area (Bradford and Gordon 1992; Bradford *et al.* 1992; Corn and Vertucci 1992; Bradford *et al.* 1994a, 1994b).

Acid precipitation has been postulated as a cause of amphibian declines at high elevations in the Sierra Nevada because waters there are low in acid neutralizing capacity, and, therefore, are susceptible to changes in water chemistry caused by acidic deposition (Byron *et al.* 1991; Bradford *et al.* 1994b). Near Lake Tahoe, at an elevation of approximately 2,100 m (6,900 ft), precipitation acidity has been documented to have increased significantly (Byron *et al.* 1991). In surface waters of the Sierra Nevada, acidity increases and acid neutralizing capacities decrease during snow melt and summer storms, though rarely does pH dip below 5.6 (Nikolaidis *et al.* 1991; Bradford and Gordon 1992; Bradford *et al.* 1998). The mountain yellow-legged frog breeds shortly after snow melt, thereby exposing its early life stages, which are most sensitive to acidification, to these conditions (Bradford and Gordon 1992). However, the hypothesis of acidic deposition as a cause of mountain yellow-legged frog declines has been rejected by field experiments that failed to show differences in water chemistry parameters between occupied and unoccupied mountain yellow-legged frog sites (Bradford *et al.* 1994b).

Extreme pH in surface waters of the Sierra Nevada is estimated at 5.0, with most high elevation lakes having a pH of greater than 6 (Bradford *et al.* 1992, 1998). Caused by oxidation of pyrite found in metamorphic and granitic rocks, a small number of lakes in the Sierra Nevada (approximately 10) are naturally acidic (Bradford *et al.* 1998). Bradford *et al.* (1998) found mountain yellow-legged frog tadpoles to be sensitive to naturally acidic conditions, and that their distribution was significantly related to lake acidity; they were not found in lakes with a pH less than 6. By contrast, the distribution of adult mountain yellow-legged frogs was not significantly related to natural lake acidity or other chemical or physical parameters. Though acidity may have an influence on mountain yellow-legged frog abundance or distribution, it is unlikely to have contributed to this species' decline, given the rarity of lakes acidified either by natural or anthropogenic sources (Bradford *et al.* 1998).

The last century has included some of the most variable climate reversals documented, at both the annual (extremes and high frequency of El Ni–o (associated with severe winters) and La Ni–a (associated with milder winters) events) and near-decadal scales (periods of 5 to 8 year drought and wet periods) (USDA 2001b). These events may have negative effects on Sierra Nevada mountain yellow-legged frogs. Severe winters (El Ni–o) would force longer hibernation times and could stress mountain yellow-legged frogs by reducing the time available for them to feed and breed. Alternately, during mild winters (La Ni–a), precipitation is reduced. This reduction in precipitation could reduce available breeding habitat and lead to stranding and death of frog eggs and tadpoles. It could also lead to increased exposure to predatory fish by forcing frogs into fish-containing waters if fishless waters dry out.

In California, prolonged droughts are a regular occurrence to which native amphibians have adapted; even severe droughts are not expected to result in widespread population declines (Drost and Fellers 1996). However, an increase in the frequency, magnitude, and duration of droughts caused by global warming may have compounding effects with respect to populations of mountain yellow-legged frogs already in decline. In situations where other factors have resulted in the isolation of mountain yellow-legged frogs to marginal habitats, localized mountain yellow-legged frog population crashes or extirpations due to droughts may exacerbate their isolation and preclude their recolonization or immigration from other populations (Bradford *et al.* 1993; Drost and Fellers 1996).

Changes in climate that occur faster than the ability of endangered species to adapt could cause local extinctions (U.S. Environmental Protection Agency

(EPA) 1989). Analysis of the Antarctic Vostok ice core has shown that over the past 160,000 years, temperatures have varied with fluctuations in the concentrations of greenhouse gasses such as carbon dioxide and methane. Since the pre-industrial era, atmospheric concentrations of carbon dioxide have increased nearly 30 percent, methane concentrations have more than doubled, and nitrous oxide (another greenhouse gas) levels have risen approximately 15 percent. The burning of fossil fuels is the primary source of these increases. Global mean surface temperatures have increased 0.3–0.7 °C (0.6–1.2 °F)) since the late 19th century (EPA 1997). Climate modeling indicates that the overall effects of global warming on California will include higher average temperatures in all seasons, higher total annual precipitation, and decreased spring and summer runoff due to decreases in snowpacks (EPA 1989, 1997). Decreases in spring and summer runoff could lead to the loss of breeding habitat for mountain yellow-legged frogs and increases in instances of stranding mortality of eggs and tadpoles.

Changes in temperature may also affect virulence of pathogens to a different degree than the amphibian immune systems are able to respond (Carey *et al.* 1999) and may make mountain yellow-legged frogs more susceptible to disease. Global warming could also affect the distribution of pathogens and their vectors, exposing mountain yellow-legged frogs (potentially with weakened immune systems as a result of other environmental stressors) to new pathogens (Blaustein *et al.* 2001). An experimental increase in stream water temperature was shown to decrease density and biomass in invertebrates (Hogg and Williams 1996); thus, global warming might have a negative impact on the mountain yellow-legged frog prey base.

Ambient ultraviolet-b (UV–B) radiation (280–320 nanometers (11.0–12.6 microinches)) has increased at north temperate latitudes in the past two decades (Adams *et al.* 2001). If UV–B radiation is contributing to amphibian population declines, the declines would likely be greater at higher elevations and at more southerly latitudes where UV–B exposure is greatest, where the thinner atmosphere allows greater penetration of UV–B (Davidson *et al.* 2001; Davidson *et al.*, 2002). In California, where there is a north-to-south gradient of increasing UV–B exposure, amphibian declines would also likely be more prevalent at southerly latitudes (Davidson *et al.* 2001; Davidson *et al.*, 2002). Melanic pigment on the upper surfaces of amphibian eggs and larvae protects these sensitive life stages against UV–B damage, an important protection for normal development of amphibians exposed to sunlight, especially at high elevations in clear and shallow waters (Stebbins and Cohen 1995). Blaustein *et al.* (1994c) observed decreased hatching success in several species of amphibian embryos (the mountain yellow-legged frog was not tested) exposed to increased UV–B radiation, indicating that this may be a cause of amphibian declines. Juveniles and adults may be exposed to increased UV–B levels as they heat themselves by basking in the sun (Stebbins and Cohen 1995). In a spatial test of the hypothesis that UV–B has contributed to decline of the mountain yellow-legged frog in the Sierra Nevada, Davidson *et al.* (2002) concluded that patterns of this species decline are inconsistent with the predictions of where UV–B related population declines would occur. Greater numbers of extant populations of this species were present at higher elevations than at lower elevations, and population decline was greater in the northern portion of the range of this species than it was in the southern portion. Though it does not appear that UV–B is a factor in the decline of the mountain yellow-legged frog, the absence of the predicted pattern for UV–B-caused decline should not be taken as proof that UV–B is not affecting the mountain yellow-legged frogs, given the potential for one or more factors that cause population declines to mask other factors (Davidson *et al.*, 2002).

Finding

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species. We reviewed the petition, information available in our files, other published and unpublished information submitted to us during the public comment period following our 90-day petition finding, and consulted with recognized mountain yellow-legged frog experts and other Federal and State resource agencies. On the basis of the best scientific and commercial information available, we find that listing the Sierra Nevada DPS of the mountain yellow-legged frog is warranted, but is precluded by higher priority listing actions.

In making this finding, we recognize that there have been declines in the distribution and abundance of the Sierra Nevada DPS of the mountain yellow-legged frog, primarily attributed to the introduction and subsequent predation of non-native fishes, as documented in the body of scientific research on the distributions of introduced trout in relation to mountain yellow-legged frogs (Bradford 1989; Bradford *et al.* 1993, 1994a, 1998; Knapp 1994, 1996; Drost and Fellers 1996; Knapp and Matthews 2000; Knapp *et al.* 2001). Direct predation of non-native fishes on mountain yellow-legged frogs has resulted in range-wide population declines and local extirpations. Furthermore, the result of these extirpations is that the remaining populations are fragmented and isolated, making them vulnerable to further declines and local extirpations from other factors. Populations that go extinct following habitat fragmentation and populations isolation are unlikely to be recolonized due to both the isolation from, and lack of, habitat connectivity to potential source populations.

For example, in reviewing documented mountain yellow-legged frog declines over the last 5 years in Sequoia and Kings National Parks, we found a 39 percent extinction rate of the frog where fish have not been stocked since the late 1970s. In comparison, over the last 7 years in the Sierra National Forest's John Muir Wilderness Area, there has been a 61 percent extinction rate where fish stocking has continued. This high rate of extinction over a 5 to 7 year time frame suggests the species' extinction within a few decades (assuming that the rate of extinction and recolonization observed over this time period accurately reflects the long-term rates) (R. Knapp, *in litt.* 2002.).

The isolation of remaining mountain yellow-legged frog populations and habitat fragmentation as a result of non-native fish introductions has made remaining populations vulnerable to extinction from random events such as disease. Disease has only recently been recognized as an important factor in the decline of this species. It appears, however, that disease will continue to play an important role in the decline of this species. It is likely that disease, specifically chytrid fungus, has contributed to the recently observed declines in Sequoia and Kings Canyon National Parks and in the Sierra National Forests's John Muir Wilderness Area (R. Knapp, *in litt.* 2002). Although the life history and modes of transmission of chytrid fungus are not well understood, it appears that this pathogen is widespread throughout the range of the mountain yellow-legged frog within the Sierra Nevada, it is persistent in ecosystems, and it is resilient to environmental conditions such as drought and freezing. Therefore, we conclude that all remaining yellow-legged frog populations within the Sierra Nevada are at risk to declines and extirpation as a result of infection by this pathogen.

Other factors include airborne contaminants, habitat degradation (mainly as a result of livestock grazing) and the inadequacy of existing regulatory mechanisms. Each of these factors may contribute to mountain yellow-legged frog population declines or extirpations. In addition, these factors are exacerbated by the effects that have been caused by non-native fishes, specifically the isolation of remaining mountain yellow-legged frog populations and habitat fragmentation. As noted previously, populations that go extinct following habitat fragmentation and population isolation are unlikely to be recolonzied due to both the isolation from, and lack of, connectivity to potential source populations.

We conclude that the overall magnitude of threats to the Sierra Nevada DPS of the mountain yellow-legged frog is high, and that the overall immediacy of these threats is imminent. Pursuant to our Listing Priority System (64 FR 7114), a DPS of a species for which threats are high and imminent is assigned a Listing Priority Number of 3. While we conclude that listing the Sierra Nevada DPS of the mountain yellow-legged frog is warranted, an immediate proposal to list is precluded by other higher priority listing actions. During Fiscal Year 2003 we must spend nearly all of our Listing Program funding to comply with court orders and judicially approved settlement agreements, which are now our highest priority actions. To the extent that we have discretionary funds, we will give priority to using them to address emergency listings and listing actions for other species with a higher priority. Due to litigation pertaining to various listing actions, our planned work with listing funds in Fiscal Year 2003 consists primarily of addressing court-ordered actions, court-approved settlement agreements, and listing actions that are in litigation. (Also, some litigation-related listing actions already are scheduled for Fiscal Year 2004.) We expect that our discretionary listing activity in Fiscal Year 2003 will focus on addressing our highest priority listing actions of finalizing expiring emergency listings.

The Sierra Nevada DPS of the mountain yellow-legged frog will be added to the list of candidate species upon publication of this notice of 12-month finding. We will continue to monitor the status of this species and other candidate species. Should an emergency situation develop with one or more of the species, we will act to provide immediate protection, if warranted.

We intend that any proposed listing action for the Sierra Nevada DPS of the mountain yellow-legged frog will be as accurate as possible. Therefore, we will continue to accept additional information and comments from all concerned governmental agencies, the scientific community, industry, or any other interested party concerning this finding.

References Cited

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

Author

The primary author of this document is Peter Epanchin of the Sacramento Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT** section).

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

Dated: January 10, 2003.

Marshall P. Jones, Jr.,

Director, Fish and Wildlife Service.

[FR Doc. 03–973 Filed 1–15–03; 8:45 am]

BILLING CODE 4310–55–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 648

[Docket No. 030108004-3004-01; ID 010303B]

RIN 0648–AQ28

Fisheries of the Northeastern United States; Atlantic Sea Scallop Fishery; Framework Adjustment 15

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

ACTION: Proposed rule; request for comments.

SUMMARY: NMFS proposes regulations to implement Framework 15 to the Atlantic Sea Scallop Fishery Management Plan (FMP) developed by the New England Fishery Management Council (Council). This rule proposes to implement management measures for the 2003 fishing year, including a days-at-sea (DAS) adjustment, and continuation of a Sea Scallop Area Access Program (Area Access Program) for 2003. The intent of this action is to achieve the goals and objectives of the FMP under the Magnuson-Stevens Fishery Conservation and Management Act and to achieve optimum yield in the scallop fishery. In addition, this proposed rule includes regulatory text that would codify an additional gear stowage provision for scallop dredge gear that was established by the Administrator, Northeast Region, NMFS (Regional Administrator) in 2001.

DATES: Comments must be received on or before 5 p.m., local time, on January 31, 2003.

ADDRESSES: Written comments should be sent to Patricia A. Kurkul, Regional Administrator, NMFS, Northeast Regional Office, One Blackburn Drive, Gloucester, MA 01930. Mark the outside of the envelope, ''Comments on Framework 15 to the Scallop FMP.'' Comments also may be sent via facsimile (fax) to (978) 281–9135. Comments will not be accepted if submitted via e-mail or Internet.

Copies of Framework Adjustment 15, its Regulatory Impact Review (RIR) including the Initial Regulatory Flexibility Analysis (IRFA), and the Environmental Assessment (EA) are available on request from Paul J. Howard, Executive Director, New England Fishery Management Council, 50 Water Street, Newburyport, MA 01950. These documents are also available online at http://www.nefmc.org.

FOR FURTHER INFORMATION CONTACT: Peter W. Christopher, Fishery Policy Analyst, 978–281–9288; fax 978–281–9135; e-mail peter.christopher@noaa.gov.

SUPPLEMENTARY INFORMATION: On September 12, 2002, the Council adopted Framework 15 to the FMP, which proposes annual management measures for the 2003 fishing year (March 1, 2003, through February 29, 2004). Framework 15 would increase the annual DAS allocation, and extend the Area Access Program in the Hudson Canyon and Virginia Beach areas for 2003. The only modification to the measures that have been in effect for the 2002 fishing year would be an increase in the possession limit allowed to vessels participating in the Area Access Program. This increase is intended to be consistent with increasing catch rates in the area so that there is sufficient incentive for vessels to fish in these areas.

Regulations implementing Amendment 7 to the FMP (64 FR 14835,