

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).