DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AF41

Endangered and Threatened Wildlife and Plants; Listing of the Chiricahua Leopard Frog (*Rana chiricahuensis*)

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule with a special rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), designate the Chiricahua leopard frog (*Rana chiricahuensis*) as a threatened species pursuant to the Endangered Species Act of 1973, as amended (Act) throughout its range. The Chiricahua leopard frog is now absent from more than 75 percent of its historical sites and numerous mountain ranges, valleys, and drainages within its former range. In areas where it is still present, populations are often small, widely scattered, and occupy marginal and dynamic habitats. Known threats include habitat alteration, destruction, and fragmentation, predation by nonnative organisms, and disease. This final rule will implement Federal protection to this species and provide funding for development and implementation of recovery actions. Concurrently with publication of this final rule, we are publishing a special rule under section 4(d) of the Act. Under the special rule, take of Chiricahua leopard frog caused by livestock use of or maintenance activities at livestock tanks located on private, State, or Tribal lands would be exempt from the prohibition of section 9 of the Act.

EFFECTIVE DATES: This rule is effective July 15, 2002.

ADDRESSES: The complete file for this rule is available for public inspection, by appointment and during normal business hours, at the Arizona Ecological Services Field Office, U.S. Fish and Wildlife Service, 2321 West Royal Palm Road, Suite 103, Phoenix, AZ, 85021–4951, telephone; 602/242–0210, facsimile; 602/242–2513, website; *http://arizonaes.fws.gov.*

FOR FURTHER INFORMATION CONTACT: James Rorabaugh, Herpetologist, Arizona Ecological Services Field Office (*see* **ADDRESSES** section).

SUPPLEMENTARY INFORMATION:

Background

Leopard frogs (*Rana pipiens* complex), long considered to consist of a few highly variable taxa, are now recognized as a diverse assemblage of 17 or more species (American Museum of Natural History 2001, Hillis *et al.* 1983), with many of these described in the last 30 years. Mecham (1968) recognized two distinct variations of ''*Rana pipiens*,'' or the northern leopard frog, in the White Mountains of Arizona. One of these, referred to as the ''southern form,'' was depicted as a stocky frog with raised folds down both sides of the back (dorsolateral folds) that were interrupted and deflected medially towards the rear. The other form matched previous descriptions of *Rana pipiens*. Based on morphology, mating calls, and genetic analyses (electrophoretic comparisons of blood proteins), Platz and Platz (1973) demonstrated that at least three distinct forms of leopard frogs occurred in Arizona, including the southern form. This southern form was subsequently described as the Chiricahua leopard frog (*Rana chiricahuensis*) (Platz and Mecham 1979).

This new species was distinguished from other members of the *Rana pipiens* complex by a combination of characters, including a distinctive pattern on the rear of the thigh consisting of small, raised, cream-colored spots or tubercles on a dark background, dorsolateral folds that were interrupted and deflected medially, stocky body proportions, relatively rough skin on the back and sides, and often green coloration on the head and back (Platz and Mecham 1979). The species also has a distinctive call consisting of a relatively long snore of one to two seconds in duration (Davidson 1996, Platz and Mecham 1979). Snout-vent lengths of adults range from approximately 54 to 139 millimeters (mm) (2.1 to 5.4 inches (in)) (Stebbins 1985, Platz and Mecham 1979). The Ramsey Canyon leopard frog (*Rana subaquavocalis*) is very similar in appearance to the Chiricahua leopard frog, but it often grows to the largest size range given for the Chiricahua leopard frog and has a call that is typically given under water (Platz 1993).

Recent articles in the scientific literature report the extirpation and extinction of amphibians in many parts of the world (Houlahan *et al.* 2000; Berger *et al.* 1998; Lips 1998, 1999; Laurence *et al.* 1996; Vial and Saylor 1993; Pechmann *et al.* 1991; Blaustein and Wake 1990). In the United States, frogs in the family Ranidae, which includes the Chiricahua leopard frog, are particularly affected (Sredl *et al.* 1997, Sredl 1993, Bradford 1991, Clarkson and Rorabaugh 1989, Hayes and Jennings 1986, Corn and Fogleman 1984). These population declines result in many cases from habitat loss or predation by introduced predaceous fishes, amphibians, and crayfish (Fernandez and Rosen 1996; Rosen *et al.* 1996a, 1994; Hayes and Jennings 1986); however, populations are sometimes extirpated from seemingly pristine habitats, often at higher elevation, montane locales (Meyer and Mikesic 1998, Sredl 1993, Drost and Fellers 1993, Corn and Fogleman 1984, Hines *et al.* 1981). In the last few years, the role of infectious diseases has been recognized as a key factor in amphibian declines in seemingly pristine areas (Carey *et al.* 2001, 1999; Daszak *et al.* 1999). A fungal skin disease, chytridiomycosis, has been linked to amphibian decline in many parts of the world (Berger *et al.* 1998, Speare and Berger 2000), including the Chiricahua leopard frog in Arizona (Sredl 2000, Sredl and Caldwell 2000) and New Mexico (C. Painter, New Mexico Department of Game and Fish, pers. comm. 2001). A number of other factors have been identified as causes or possible causes of global amphibian decline; although their role in the declining status of the Chiricahua leopard frog is poorly studied or unknown, they may be contributing causal factors. They include climate change or climatic extremes (Alexander and Eischeid 2001, Pounds *et al.* 1999, Fellers and Drost 1993, Dimmitt 1979); transport (sometimes over long distances) and deposition of contaminants, dust, gases (Stallard 2001), and pesticides (Cowman *et al.* 2001, Davidson *et al.* 2001, Lips 1998); increased levels of ultraviolet-B radiation and interactions with pathogens, particularly a water mold (*Saprolegnia ferax*) (Blaustein *et al.* 1994, Keisecker and Blaustein 1995); acid rain (Vatnick *et al.* 1999, Blanchard and Stromberg 1987); cadmium and arsenic contamination (Hale and Jarchow 1988); and over-collection (Jennings and Hayes 1985). Furthermore, factors are likely working in synergy to exacerbate deleterious effects (Carey *et al.* 2001, 1999; Keisecker *et al.* 2001, Middleton *et al.* 2001, Vatnick *et al.* 1999, Keisecker and Blaustein 1995). Increased extirpation rates and in some cases extinction, coupled with recent declining trends in the status of many amphibian populations worldwide, are alarming and represent a very recent and rapid global decline of an entire class of vertebrates on all six continents on which they live (Carey *et al.* 1999, Blaustein *et al.* 1994, Wake 1991).

The Chiricahua leopard frog is known currently or historically from cienegas (mid-elevation wetland communities

often surrounded by arid environments), pools, livestock tanks (*i.e.,* small earthen ponds), lakes, reservoirs, streams, and rivers at elevations of 1,000 to 2,710 meters (m) (3,281 to 8,890 feet (ft)) in central and southeastern Arizona; west-central and southwestern New Mexico; and, in Mexico, northern Sonora and the Sierra Madre Occidental of Chihuahua and Durango (Sredl and Jennings in press, Sredl *et al.* 1997, Degenhardt *et al.* 1996, McCranie and Wilson 1987, Platz and Mecham 1984, 1979). The range of the species is divided into two parts, including—(1) a southern group of populations (the majority of the species' range) located in mountains and valleys south of the Gila River in southeastern Arizona, extreme southwestern New Mexico, and Mexico; and (2) northern montane populations in west central New Mexico and along the Mogollon Rim in central and eastern Arizona (Platz and Mecham 1979). Historical records exist for Pima, Santa Cruz, Cochise, Graham, Apache, Greenlee, Gila, Coconino, Navajo, and Yavapai Counties, AZ, and Catron, Grant, Hidalgo, Luna, Soccoro, and Sierra Counties, NM (Sredl *et al.* 1997, Degenhardt *et al.* 1996).

The distribution of the Chiricahua leopard frog in Mexico is unclear. The species has been reported from northern Sonora, Chihuahua, and Durango (Hillis *et al.* 1983, Platz and Mecham 1984, 1979) and, more recently, from the State of Aguascalientes (Diaz and Diaz 1997). However, Webb and Baker (1984) concluded that frogs from southern Chihuahua were not Chiricahua leopard frogs, as expected. The taxonomic status of *chiricahuensis*-like frogs in Mexico from southern Chihuahua to the State of Aguascalientes is unclear and in this region another leopard frog, *Rana montezumae,* may be mistaken for the Chiricahua leopard frog.

Recent genetic analyses, including a 50-loci (location of a gene on a chromosome) starch gel survey, morphometrics, and analyses of nuclear DNA supports describing the northern, or Mogollon Rim populations in Arizona of the Chiricahua leopard frog as a distinct species (Platz and Grudzien 1999). Multiple haplotypes (sets of genes inherited as a unit) within *chiricahuensis* were also identified using mitochondrial DNA analysis (Benedict and Quinn 1999), providing further evidence of genetically distinct population segments. If the species is split into two or more distinct taxa, fewer populations would exist within each taxon, increasing the level of endangerment for each.

Chiricahua leopard frogs have been either collected or observed at 231 sites in Arizona (B. Kuvlesky, Buenos Aires National Wildlife Refuge, pers. comm. 1997; Terry Myers, Apache Sitgreaves National Forest, pers. comm. 1997; Sredl *et al.* 1997; Rosen *et al.* 1996a&b; Snyder *et al.* 1996; C. Schwalbe, University of Arizona, pers. comm. 1995; R. Zweifel, Portal, Arizona, pers. comm. 1995; Hale 1992; Clarkson and Rorabaugh 1989; Fish and Wildlife Service files, Phoenix, Arizona). In New Mexico the species has been either collected or observed at 182 sites (Painter 2000). Eleven historical sites were listed by Platz and Mecham (1979) in Mexico, mostly from the eastern base and foothills of the Sierra Madre Occidental in Chihuahua and Durango, with one site in northern Sonora. Hillis *et al.* (1983) list another site from Durango, and frogs at a site on the Sonora-Chihuahua border have been tentatively identified as Chiricahua leopard frogs (Holycross 1998). The presence of Chiricahua leopard frogs in the Sierra Madre Occidental of southern Chihuahua was questioned by Webb and Baker (1984), and as discussed, taxonomic questions complicate defining the range of the species in Mexico beyond northern and central Chihuahua and northern Sonora.

Some museums still have many southwestern leopard frogs catalogued as *Rana pipiens.* Once these specimens have been reexamined, additional historical sites for *Rana chiricahuensis* may result. Also, frogs observed at some sites in the wild, which may have been *Rana chiricahuensis,* were not positively identified.

Many collections of Chiricahua leopard frogs were made before 1980 (Painter 2000, Jennings 1995; Platz and Mecham 1979; Frost and Bagnara 1977; Mecham 1968). Recent surveys to document the status and distribution of the species were conducted primarily from the mid-1980s to the present (Painter 2000; Sredl *et al.* 1997, 1995, 1994, 1993; Rosen *et al.* 1996a; Fernandez and Bagnara 1995; Jennings 1995; Rorabaugh *et al.* 1995; Rosen 1995; Zweifel 1995; Sredl and Howland 1994, 1992; Hale 1992; Scott 1992; Wood 1991; Clarkson and Rorabaugh 1991, 1989; Rosen and Schwalbe 1988). These surveys were summarized first by Jennings (1995) and then Painter (2000) for New Mexico and by Sredl *et al.* (1997) for Arizona.

In 1995, Jennings reported Chiricahua leopard frogs still occurred at 11 sites in New Mexico. Based on additional work, Painter (2000) listed 41 sites at which Chiricahua leopard frogs were found from 1994 to 1999. Thirty-three of these are north of Interstate 10 (northern populations) and eight are in the southwestern corner of the State (southern populations). Thirty-one of the 41 populations were verified extant during 1998 and 1999 (Painter 2000). However, during May through August 2000, the Chiricahua leopard frog was found extant at only 8 of 34 of the sites (C. Painter, pers. comm. 2000). Three populations east of Hurley in Grant County declined or were extirpated during 1999 and 2000 (R. Jennings, pers. comm. 2000), and preliminary data indicate another population on the Mimbres River, also in Grant County, has experienced a significant die-off (C. Painter and R. Jennings, pers. comm, 2000).

Sredl *et al.* (1997) reported that during 1990 through 1997 Chiricahua leopard frogs were found at 61 sites in southeastern Arizona (southern populations) and 15 sites in central and east-central Arizona (northern populations). As a means to make the Arizona and New Mexico status information more comparable, the number of sites at which Chiricahua leopard frogs were observed from 1994 through 2001 in Arizona were tallied. Based on available data, particularly Sredl *et al.* (1997), Rosen *et al.* (1996b), and Service files, Chiricahua leopard frogs were observed at 87 sites in Arizona from 1994 to 2001, including 21 northern sites and 66 southern sites. Many of these sites have not been revisited in recent years; however, evidence suggests some populations have recently been extirpated in the Galiuro and Chiricahua mountains, while others, most notably in the Buckskin Hills area of the Coconino National Forest, have been recently (2000–2001) discovered. In 2000, the species was also documented for the first time in the Baboquivari Mountains, Pima County, Arizona (E. Wallace, pers. comm. 2000), extending the range of the species approximately 19 kilometers (km) (12 miles (mi)) to the west.

Intensive and extensive surveys were conducted by Arizona Game and Fish Department (AGFD) in Arizona from 1990 to 1997 (Sredl *et al.* 1997). Included were 656 surveys for ranid frogs (frogs in the family Ranidae) within the range of the Chiricahua leopard frog in southeastern Arizona. Rosen *et al.* (1996a&b, 1994), Hale (1992), Wood (1991), Clarkson and Rorabaugh (1989), and others have also extensively surveyed wetlands in southeastern Arizona. It is unlikely that many additional new populations will be found there. A greater potential exists for locating frogs at additional sites in Arizona's northern region, as several new populations have been discovered on the Coconino National Forest in 2000

and 2001. Sredl *et al.* (1997) conducted 871 surveys for ranid frogs in the range of the northern sites, but report that only 25 of 46 historical Chiricahua leopard frog sites were surveyed during 1990–1997. The majority of these unsurveyed historical sites are in the mountains north of the Gila River in east-central Arizona. Additional extant populations of Chiricahua leopard frogs may occur in this area.

Of the historical sites in New Mexico, 24 have imprecise site information that precludes locating or revisiting them. Many others are on private lands to which the owners have denied access to biologists (the privately owned Gray and Ladder ranches are notable exceptions). As in Arizona, potential habitat within the range of the southern populations has been surveyed more extensively than that of the northern populations. From 1990 to 1991, Scott (1992) conducted extensive surveys of the Gray Ranch, which contains much of the Chiricahua leopard frog habitat in southwestern New Mexico. Observations from numerous other herpetologists were included in his reports, and cowboys and ranch hands were interviewed to locate potential habitats. Jennings (1995) surveyed other potential habitats in southwestern New Mexico outside of the Gray Ranch in the Peloncillo Mountains. Other herpetologists working in that area, including Charles Painter (pers. comm. 2001), and Andy Holycross, Arizona State University (pers. comm. 1998), also worked extensively in this area. Probably few if any unknown populations of Chiricahua leopard frogs occur in southwestern New Mexico.

Surveys in the northern portion of the species' range in New Mexico have been less complete. Jennings (1995) believed that the wilderness areas of the Gila National Forest have the greatest potential for supporting additional extant populations and for securing an intact metapopulation that would have a good chance of long-term persistence. A metapopulation is an assemblage of populations with some level of migration between them, in which individual populations may be extinct but can then be recolonized from other populations. Recent surveys (1995 to 1999) have discovered four extant populations in the Gila Wilderness (Painter 2000).

In Mexico systematic or intensive surveys for Chiricahua leopard frogs have not been conducted. However, it is expected that the species almost certainly occurs or occurred at more than the 12 (or 13) reported sites in Chihuahua, Sonora, and Durango (Platz and Mecham 1979, Hillis *et al.* 1983, and Holycross 1998). Only one site has been documented in Sonora, yet many populations occur or occurred in the mountain ranges and valleys adjacent to the Sonora border in Arizona. Other sites probably occur or occurred in Sonora. The identity of leopard frogs in southern Chihuahua (and perhaps Durango) is in some question (Webb and Baker 1984). Reports of the species from Aguascalientes (Diaz and Diaz 1997) are similarly questionable and should be confirmed by genetic analysis.

The Chiricahua leopard frog is reported absent from a majority of surveyed historical sites. For example, in Arizona, Clarkson and Rorabaugh (1989) found the species at only 2 of 36 sites that supported Chiricahua leopard frogs in the 1960s and 1970s. In New Mexico, Jennings (1995) found Chiricahua leopard frogs at 6 of 33 sites supporting the species during the previous 11 years. During 1998 to 1999, Chiricahua leopard frogs were found at 31 of the 41 sites where they had been documented after 1993 (Painter 2000); however, subsequent surveys in 2000 only revealed frogs at 8 of 34 of these sites (C. Painter, pers. comm. 2001). Sredl and Howland (1994) reported finding Chiricahua leopard frogs at only 12 of 53 historical sites. In 1994, during surveys of 175 wetland sites in southeastern Arizona, Rosen *et al.* (1994) reported the Chiricahua leopard frog was extant at 19 historical and new sites, but was not found at 32 historical sites. Throughout Arizona, Sredl *et al.* (1997) found the species present at 21 of 109 historical sites.

Determining whether a species is declining based on its presence or absence at historical sites is difficult. Where frogs are observed at a particular site, they are considered extant. However, a failure to find frogs does not necessarily indicate the species is absent. Corn (1994) notes that leopard frogs may be difficult to detect (the frogs hide by movement and camouflage, and are often not vocal), museum records do not always represent breeding sites, collections have occurred from marginal habitat, and museum and literature records often represent surveys over long periods of time, which ignores natural processes of geographical extinction and recolonization. These latter natural processes may be particularly important for the Chiricahua leopard frog because its habitats are often small and very dynamic. Because the Chiricahua leopard frog and other southwestern leopard frogs exhibit a life history that predisposes them to high rates of extirpation and recolonization (Sredl and Howland 1994), absence from at least some historical sites is expected.

However, the failure of experienced observers to find frogs in relatively simple aquatic systems such as most stock tanks and stream segments indicates that frogs are probably absent. Stock tanks (also known as livestock tanks) are defined as an existing or future impoundment in an ephemeral drainage or upland site constructed primarily as a watering site for livestock. Howland *et al.* (1997) evaluated visual encounter surveys at five leopard frog sites. At sites with known populations that were not dry, frogs were detected in 93 of 100 surveys conducted during the day from April through October. During a drought in 1994, Rosen *et al.* (1996a, 1994) surveyed all Chiricahua leopard frog sites known at that time in southeastern Arizona and other accessible waters, and discussed locations of waters and faunal occurrence with landowners. By focusing on aquatic sites that did not go dry, and through careful and often multiple surveys at each site, the authors were able to define distribution at a time when aquatic faunal patterns were clear. The authors believed that nearly all potential habitat was surveyed, and, if frogs were present, they would have been detectable at most sites.

Although Chiricahua leopard frogs were found out at 129 sites from 1994 to the present, because of the inherent dynamic nature of southwestern wetland and riparian habitats (e.g., flooding, drought, and human activities), coupled with the increased likelihood of extirpation characteristic of small populations, the viability of extant populations of the Chiricahua leopard frog is thought, in many cases, to be relatively short. As discussed in Factor E of the ''Summary of Factors Affecting the Species'' section below, approximately 38 percent of sites occupied by Chiricahua leopard frogs from 1994 to 2001 were artificial tanks or impoundments constructed for watering livestock. The dynamic nature of stock tank habitats and the small size of the populations that inhabit them suggest that many of these populations are not likely to persist for long periods.

Rosen *et al.* (1996a) hypothesized that ''the ongoing restriction of Chiricahua leopard frogs to shallow, marginal habitat types means that eventually the species will be wiped out by a drought (see Fellers and Drost 1993, Corn and Fogelman 1984) that it would readily have weathered in refugia now pre-empted by nonnative species. Our hypothesis clearly predicts that this species will go extinct in southern

Arizona, and probably elsewhere, unless appropriate action is taken.'' In New Mexico, Painter (1996) reported similar findings: ''*Rana chiricahuensis* is rapidly disappearing from southwest New Mexico (Jennings 1995, pers. obs.). Unless these unexplainable trends are quickly reversed, I expect the species to be extirpated from 90 to 100 percent of its former range in New Mexico within the next decade.''

Although survey data strongly suggest that the species is absent from more than 75 percent of historical sites (Painter 2000, Sredl *et al.* 1997, Jennings 1995), we include here further analysis to investigate whether extirpations represent natural fluctuations or long-term declines caused by human impacts (Blaustein *et al.* 1994, Pechman *et al.* 1991).

Numerous studies indicate that declines and extirpations of Chiricahua leopard frogs are at least in part caused by predation and possibly competition by nonnative organisms, including fishes in the family Centrarchidae (*Micropterus* spp., *Lepomis* spp.), bullfrogs (*Rana catesbeiana*), tiger salamanders (*Ambystoma tigrinum mavortium*), crayfish (*Oronectes virilis* and possibly others), and several other species of fishes, including, in particular, catfishes (*Ictalurus* spp. and *Pylodictus oliveris*) and trout (*Oncorhynchus* spp. (=*Salmo*) and *Salvelinus* spp.) (Fernandez and Rosen 1998, Rosen *et al.* 1996a, 1994; Snyder *et al.* 1996; Fernandez and Bagnara 1995; Sredl and Howland 1994; Clarkson and Rorabaugh 1989). For instance, in the Chiricahua region of southeastern Arizona, Rosen *et al.* (1996a) found that almost all perennial waters investigated that lacked introduced predatory vertebrates supported Chiricahua leopard frogs. All waters except three that supported introduced vertebrate predators lacked Chiricahua leopard frogs. The authors noted an alarming expansion of nonnative predatory vertebrates over the last two decades. In the Chiricahua region, Chiricahua leopard frogs were primarily limited to habitats subject to drying or near drying, such as stock tanks. These habitats are not favored by nonnative predatory fishes and bullfrogs, but because they are not stable aquatic habitats they are marginal for leopard frogs (Rosen *et al.* 1994).

Additional evidence that the observed absence of Chiricahua leopard frogs from historical sites is not the result of a natural phenomenon emerges from analysis of regional occurrence. If the extirpation of the Chiricahua leopard frog was a natural consequence of metapopulation dynamics or other population level processes, then an observer would not expect to find the species absent from large portions of its range. Rather, Chiricahua leopard frogs might be absent from some historical sites, but would still be found at other new or historical sites in the region. In New Mexico, Painter (2000) reported that, with the possible exception of the Yaqui River drainage, extant Chiricahua leopard frog populations occur in each of the six major drainages where the species was found historically (Tularosa/San Francisco, Mimbres, Alamosa/Seco/Rio Grande, Gila, Playas, and Yaqui). However, occurrence of the frog in these drainages is characterized by few, mostly small, isolated populations. Populations in the Playas drainage are probably limited to two introduced populations in steep-sided livestock tanks from which frogs cannot escape (Painter 2000). The species was not found on the mainstem, Middle Fork, or East Fork of the Gila River, where the species occurred historically at many sites.

In Arizona, the species is still extant in seven of eight major drainages of historical occurrence (Salt, Verde, Gila, San Pedro, Santa Cruz, Yaqui/Bavispe, and Magdalena river drainages), but appears to be extirpated from the Little Colorado River drainage on the northern edge of the species' range. Within the extant drainages, the species was not found recently in some major tributaries and/or from river mainstems. For instance, the species was not reported from 1995 to the present from the following drainages or river mainstems where it historically occurred: White River, West Clear Creek, Tonto Creek, Verde River mainstem, San Francisco River, San Carlos River, upper San Pedro River mainstem, Santa Cruz River mainstem, Aravaipa Creek, Babocomari River mainstem, and Sonoita Creek mainstem. In southeastern Arizona, no recent records (1995 to the present) exist for the following mountain ranges or valleys: Pinaleno Mountains, Peloncillo Mountains, Sulphur Springs Valley, and Huachuca Mountains. Moreover, the species is now absent from all but one of the southeastern Arizona valley bottom cienega complexes. The Chiricahua leopard frog is known or suspected to have been historically present, and at least in some cases, very abundant (Wright and Wright 1949) in each major southeastern Arizona valley bottom cienega complex. It is thought to be breeding in small numbers in the Empire Cienega, but is absent as a breeding species from all others, including Arivaca Cienega, upper Santa Cruz Valley cienegas, Babocomari Cienega, marshy bottoms of the upper San Pedro River, Whitewater Creek and Hooker Cienega in the Sulphur Springs Valley, Black Draw and associated cienegas, and San Simon Cienega. Three frogs were recently observed at the O'Donnell Creek cienega, but these appear to be immigrants from nearby populations (P. Rosen, pers. comm. 2000). These large, valley bottom cienega complexes may have supported the largest populations in southeastern Arizona, but are now so overrun with nonnative predators that they do not presently support the Chiricahua leopard frog in viable numbers (Rosen *et al.* in press). These apparent regional extirpations provide further evidence that the species is disappearing from its range. Once extirpated from a region, natural recolonization of suitable habitats is unlikely to occur in the near future.

Where the species is still extant, sometimes several small populations are found in close proximity, suggesting metapopulations are important for preventing regional extirpation (Sredl *et al.* 1997). Disruption of metapopulation dynamics is likely an important factor in regional loss of populations (Sredl *et al.* 1997, Sredl and Howland 1994). Chiricahua leopard frog populations are often small and their habitats are dynamic, resulting in a relatively low probability of long-term population persistence. However, if populations are relatively close together and numerous, extirpated sites can be recolonized.

Human disturbances can result in increased rates of extinction and decreased rates of recolonization. If the extinction rate for a given population exceeds the colonization rate, that population will go extinct (Hanski 1991). Various human impacts (see ''Summary of Factors Affecting the Species'' section) can result in increased extinction rates and increased isolation of populations within a metapopulation with resulting decreased colonization rates. In addition, big rivers, cienega complexes, lakes, and reservoirs that once probably supported large populations of Chiricahua leopard frogs, and were likely stable source populations for dispersal to smaller sites, are almost all inhabited by nonnative predators and thus are unsuitable as habitat for this species (Sredl *et al.* 1997, Rosen *et al.* 1996a, Sredl and Howland 1994). The currently extant smaller populations almost certainly exhibit greater extinction rates than these larger populations did historically, increasing the importance of metapopulations for maintaining viable populations or groups of frog populations. However, pathogens may

counter some of the beneficial aspects of metapopulations. Once introduced into a metapopulation, a disease such as chytridiomycosis can spread to and eliminate groups of adjacent populations as frogs move between wetland sites. This is the most reasonable explanation of extirpation of the Chiricahua leopard frog from a metapopulation of stock tanks in New Mexico (Declining Amphibian Populations Task Force 1993, R. Jennings, pers. comm. 2000).

Previous Federal Action

Based on status information indicating the species was recently extirpated from historical sites (Clarkson *et al.* 1986, Clarkson and Rorabaugh 1989), the Chiricahua leopard frog was added to the list of category 2 candidate species with the publication of a comprehensive Notice of Review on November 21, 1991 (56 FR 58804). We also included the species as a category 2 candidate in the November 15, 1994, Notice of Review (59 FR 58982). Category 2 candidates were those taxa for which we had some evidence of vulnerability and threats, but for which we lacked sufficient data to support a listing proposal.

We elevated the Chiricahua leopard frog to category 1 candidate status on July 11, 1994. This change in the status of the species came too late to appear in the November 15, 1994, Notice of Review. Category 1 candidates were taxa for which we had on file sufficient information on biological vulnerability and threats to support proposals to list them as endangered or threatened, but for which preparation of listing proposals was precluded by higher priority listing actions.

Beginning with our February 28, 1996, Candidate Notice of Review (61 FR 7596), we discontinued the designation of multiple categories of candidates, and only those taxa meeting the definition for former category 1 candidates are now considered candidates for listing purposes. In the February 28, 1996, notice, we identified the Chiricahua leopard frog as a candidate species.

On June 10, 1998, we received a petition dated June 4, 1998, from the Southwest Center for Biological Diversity to list the Chiricahua leopard frog as endangered and to designate critical habitat for the species. In a letter dated July 7, 1998, we informed the petitioner that pursuant to the Service's July 1996 Petition Management Guidance, we consider candidate species to be under petition and covered by a ''warranted but precluded'' finding under section 4(b)(3)(B)(iii) of the Act. The petitioner filed a complaint for declaratory and injunctive relief with the Arizona District Court on August 25, 1999, which asked the court to require the Secretary of the Interior to take action on the petition. We published the proposed rule to list the Chiricahua leopard frog in the **Federal Register** on June 14, 2000 (65 FR 37343). In that same rule we also published a proposed special rule that we are finalizing as discussed below.

On August 29, 2001, the Service announced a settlement agreement in response to litigation by the Center for Biological Diversity, the Southern Appalachian Biodiversity Project, and the California Native Plant Society. Terms of the agreement require that we submit to the **Federal Register**, on or before June 6, 2002, a final listing and critical habitat decision for the Chiricahua leopard frog. This agreement was entered by the court on October 2, 2001 (*Center for Biological Diversity, et al.* v. *Norton,* Civ. No. 01–2063 (JR) (D.D.C.)).

Special Rule

Concurrently with publication of this final rule to list the Chiricahua leopard frog as threatened, we are publishing a special rule under section 4(d) of the Act to amend regulations at 50 CFR 17.43. The special rule replaces the Act's general prohibitions against take of the Chiricahua leopard frog with special measures tailored to the conservation of the species on all non-Federal lands. Through the maintenance and operation of the stock tanks for cattle, habitat is provided for the leopard frogs, hence there is a conservation benefit to the species. Under the special rule, take of Chiricahua leopard frog caused by livestock use of or maintenance activities at livestock tanks located on private, State, or Tribal lands would be exempt from section 9 of the Act. See Summary of Factors for more information on take. As noted above, a livestock tank is defined as an existing or future impoundment in an ephemeral drainage or upland site constructed primarily as a watering site for livestock. The rule targets tanks on private, State, and Tribal lands to encourage landowners and ranchers to continue to maintain these tanks as they provide habitat for the frogs. Livestock use and maintenance of tanks on Federal lands will be addressed through the section 7 process. When a Federal action, such as permitting livestock grazing on Federal lands, may affect a listed species, consultation between us and the action agency is required pursuant to section 7 of the Act. The conclusion of consultation may include mandatory changes in livestock programs in the form of measures to minimize take of a listed animal or to avoid jeopardizing the continued existence of a listed species. Changes in a proposed action resulting from consultations are almost always minor. (See our response to Issue 8 and Factor A in the Summary of Factors for further discussion.)

Summary of Comments and Recommendations

In the June 14, 2000, proposed rule and associated notifications, we requested that all interested parties submit factual reports or information that might contribute to the development of this final rule. The comment period for the proposed rule was initially open from June 14 through September 12, 2000. In a September 27, 2000, **Federal Register** notice (65 FR 58032), we reopened the comment period from September 27 through November 13, 2000, announced two public hearings, and clarified the proposed special rule that accompanied the proposed rule. We contacted four peer reviewers; appropriate elected officials from State, Federal, and local governments; Mexican, Tribal, Federal, and State agencies; county and city governments; scientific organizations; and other interested parties and requested that they comment. We published legal notices in the following newspapers announcing the proposal and inviting comment: Arizona Business Gazette (July 6, 2000), Tucson Citizen (June 28, 2000), Arizona Daily Star (June 28, 2000), Albuquerque Journal (June 28, 2000), Albuquerque Tribune (June 28, 2000), Sierra Vista Herald (June 27, 2000), Bisbee Daily Review (June 27, 2000), Silver City Daily Press (June 26, 2000), and the White Mountain Independent (June 30, 2000). To announce the reopening of the comment period, public hearings, and the clarification of the special rule, we published legal notices in the Arizona Republic (October 5, 2000), Tucson Citizen (October 2, 2000), Arizona Daily Star (October 2, 2000), Sierra Vista Herald (September 29, 2000), Bisbee Daily Review (September 29, 2000), Silver City Daily Press (September 28, 2000), and White Mountain Independent (October 3, 2000). We received 23 comment letters. Nine of these opposed, seven supported, and seven were neutral on the proposed listing action. The breakdown of the comments included two from Federal agencies, two from State agencies, one from a County, ten from organizations or corporations, and eight from

individuals. These included the letters from the four peer reviewers (two from State agencies and two from individuals). We also received 11 requests for public hearings. In response to those requests, public hearings were held in Silver City, New Mexico, on October 10, 2000, and in Bisbee, Arizona on October 11, 2000. Thirteen people attended the hearing in Silver City, during which four individuals and two representatives of organizations provided oral comments. Six people attended the hearing in Bisbee; two individuals provided oral comments. In total, four of the commenters at the hearings supported and one opposed listing, and three provided additional information or asked questions.

We updated the final rule to reflect comments and information we received during the comment period. We address opposing comments and other substantive comments concerning the rule below. Comments of a similar nature or point are grouped together (referred to as ''Issues'' for the purpose of this summary) below, along with our response to each.

Issue 1: The frog should be protected under a conservation agreement in lieu of listing. Several commenters commented that the Chiricahua leopard frog would be better protected under a conservation agreement in lieu of listing as threatened. Commenters noted that conservation efforts are underway for the species in several areas that could serve as models for conservation strategies and agreements, and that ranchers and others are more likely to work with the Service on conservation if the species is not listed.

Response: Valuable conservation efforts have been undertaken for the Chiricahua leopard frog in Arizona on the Tonto National Forest near Young (Sredl and Healy 1999), in the San Bernardino Valley (Rosen and Schwalbe 2000; Biology 150, Douglas High School 1998), and Buenos Aires National Wildlife Refuge (Schwalbe and Rosen 2001, Schwalbe et al. 2000), and in New Mexico on the Mimbres River, as described in the proposed rule. As mentioned by the commenters, these efforts are models for future conservation of the species and we encourage the development of similar efforts elsewhere within the range of the frog. However, a conservation agreement is unlikely to preclude the need to list this particular species for several reasons. Conservation agreements are most effective when there is a good understanding of the relationship between habitat management and maintenance of the species, and of the specific management needed to conserve it. As discussed in the ''Background'' section, the Chiricahua leopard frog is declining, but the causes of the declines are not always clear. Finding solutions to two of the primary identified causes of decline, disease and predation by introduced organisms, will not be easy, and will likely involve considerable research. Implementing solutions will likely require considerable corrective or restorative actions. However, at this time we do not know how to address these serious threats on a landscape scale. If other factors, such as climate change, UV–B radiation, acid rain, or airborne contaminants from copper smelters in Mexico, are contributing to the decline of the species, these are also threats for which we have no easy solution, and which could not be addressed adequately in a conservation agreement. Furthermore, funding is not available to research, develop, and coordinate comprehensive solutions to problems facing this species, let alone implement them throughout the species' extensive range. The primary goal of a conservation agreement, whether it be a candidate conservation agreement with assurances for private or State landowners, or conservation agreements with Federal agencies, should be to reduce threats to a species to a point where listing is not needed. That goal is not achievable at this time. To conclude, a conservation agreement in lieu of listing is not appropriate for the Chiricahua leopard frog for the following reasons: (1) Our knowledge of why populations have declined or disappeared is incomplete, (2) we do not know how to alleviate some of the major identified threats, and (3) only limited resources are available to develop or implement needed management. We commit to continue our efforts to work with landowners and encourage involvement in conservation efforts for the frog.

Issue 2: The special rule should be clarified and expanded. One commenter suggested that the special rule be expanded to include an exemption from section 9 of the Act for management and operation of, and sport fishery and angling in, all artificial and managed water bodies on all State and Federal lands. Another commenter requested that the special rule be extended to ''acequias,'' which is a name used for historical irrigation headwaters and ditches in New Mexico. Other commenters asked that we extend the rule to livestock tanks on State and Federal lands, as well as private and Tribal lands.

Response: Extension of the rule to sport fisheries management and angling in waters occupied or potentially occupied by the Chiricahua leopard frog is also not appropriate. Special rules may be issued by the Secretary of the Interior pursuant to section 4(d) of the Act when such regulation is deemed ''necessary and advisable to provide for the conservation of the species.'' Predation by nonnative fishes, some of them sport fish, is a potential threat to the Chiricahua leopard frog. Extension of the special rule to sport fisheries management and angling would thus not be consistent with the conservation needs of the Chiricahua leopard frog and with section 4(d) of the Act. Extension of the special rule to acequias is not necessary because the only known current or historical occurrence of a Chiricahua leopard frog in or near an acequia is at a spring in the headwaters of an acequia located on Bureau of Land Management lands in Sierra County, NM. Any work at this site must be approved by the Bureau of Land Management, and therefore is a Federal action that would be evaluated in consultation pursuant to section 7 of the Act. As a result, coverage for acequias under the special rule would be duplicative from a regulatory perspective.

We published a **Federal Register** notice (65 FR 58032) on September 27, 2000, clarifying that the proposed special rule extends to operation and maintenance of livestock tanks on private, State, and Tribal lands. Extension to tanks or other bodies of water on Federal lands is unnecessary and would be duplicative from a regulatory perspective because the section 7 consultation process in the Act is designed to efficiently evaluate effects to listed species for projects such as stock tanks, and authorize take, if appropriate, via an incidental take statement in a biological opinion. Since the Chiricahua leopard frog was proposed for listing, we have conducted a number of section 7 conferences with the Forest Service in regard to grazing in Chiricahua leopard frog habitat. None of these conferences have concluded that grazing would jeopardize the continued existence of the Chiricahua leopard frog. Where grazing would affect occupied habitat we have in some cases anticipated that take of Chiricahua leopard frogs would occur, and included measures to minimize that take. These measures have included, for instance, guidelines for stock tank maintenance, guidelines for cleaning or drying equipment and gear used at one tank before using it at another tank as a means of preventing disease transmission, and preconstruction

surveys for frogs in areas to be affected by range improvement projects. In no case have we required changes in stocking rates, use of pastures, or utilization rates, or made other major modifications to livestock operations during the section 7 process.

Issue 3: In the proposed rule we solicited comment on the desirability of issuing a special rule that would exempt activities associated with conservation plans that promote recovery from the section 9 take prohibitions, so long as the plans are approved by us and the appropriate State game and fish agency. Two commenters believed that extending the special rule to these circumstances would be beneficial and would likely promote recovery efforts.

Response: We did not expand the special rule to provide coverage for conservation plans. A multi-party conservation agreement exists for this species that promotes recovery and was approved by us and AGFD; thus, it could serve as a model conservation plan element of a special rule. We want to encourage to the fullest extent possible cooperative conservation planning and implementation such as the efforts described above. However, we believe we can provide technical assistance, all necessary permits, and in many cases, limited funding to support these activities in the absence of a special rule. For example, we are providing funding through AGFD for development of a safe harbor agreement to address conservation planning by the Malpai Borderlands Group in southeastern Arizona and southwestern New Mexico. In summary, coverage of conservation planning under the special rule is not needed to allow current efforts to proceed and to promote and permit future conservation.

Issue 4: One commenter noted that the taxonomy of the Ramsey Canyon leopard frog is in question, and it could be subsumed into *Rana chiricahuensis.*

Response: If a peer-reviewed paper is published in a scientific journal that subsumes that species into *Rana chiricahuensis,* we will promptly work with our partners in that conservation agreement to put in place safe harbor agreements, habitat conservation plans, and other regulatory tools as needed to maintain the successful continuity of the program and ensure our partners do not face legal vulnerability as a result of their efforts to conserve this frog.

Issue 5: Information is inadequate to support listing the Chiricahua leopard frog. Several commenters believed that the status information on the Chiricahua leopard frog is inadequate to support listing the species as threatened. Commenters pointed to numerous places in the proposed rule where we state that specific factors *may* be a threat, but few if any supportive data exist. Several commenters believed surveys were inadequate to quantify whether declines have occurred. They believed the frog could occur at many unsurveyed sites, particularly on private lands, and thus not be in danger of extinction. Commenters noted that over 12,000 stock tanks are located within watersheds occupied by the frog in Arizona, and over 10,000 in New Mexico, but only several dozen have been surveyed. One commenter questioned the qualifications of researchers cited, and others stated the listing should be based on peer-reviewed science. One commenter thought systematic or intensive surveys must be conducted in Mexico prior to listing. Another asked if studies had been completed to determine whether observed declines in Chiricahua leopard frog populations are natural fluctuations or long-term trends.

Response: Chiricahua leopard frogs are difficult to identify, thus some survey data may be in error. The data standard upon which a listing decision must be based is stated at section 4(b)(1)(A) of the Act: Listings shall be made ''solely on the basis of the best scientific and commercial data available.'' In evaluating the status of the Chiricahua leopard in the proposed rule, the preferable data to use is found in peer-reviewed scientific journals, followed by other peer-reviewed published or unpublished reports, non peer-reviewed reports by experts on the species, other reports available to us, and personal communications. For the development of this rule, the relied-upon information consisted mostly of peer-reviewed reports, most of which are unpublished. In some cases the best information available was personal communications with experts on the species. Relatively few peer-reviewed scientific journal articles have been published specifically about the status of the Chiricahua leopard frog.

Although few peer-reviewed journal articles are available, there is a wealth of information about declines and, to a lesser extent, causes of decline of the Chiricahua leopard frog in the United States. Historical distribution was well-explored, particularly in the 1960s and 1970s, when researchers were sorting out the taxonomy of southwestern leopard frogs (Pace 1974, Platz and Platz 1973, Mecham 1968). This intensive work occurred in the context of nearly 100 years of collections in Arizona and New Mexico, resulting in leopard frogs being well-represented in museum collections (Rosen *et al.* 1996b, Fritts *et al.* 1984). Fritts *et al.* (1984) list 61 sites for Chiricahua leopard frog in New Mexico. Sredl *et al.* (1997) list 147 historic sites for Arizona.

Declines in southwestern leopard frogs and other ranid frogs were first noted in the 1970s (Hale and May 1983), and in the early 1980s an effort was initiated to document the decline and identify causes (Clarkson and Rorabaugh 1989, Rosen and Schwalbe 1988, Clarkson *et al.* 1986, Fritts *et al.* 1984). In 1990, AGFD hired a leopard frog projects coordinator, and since that time, the AGFD has devoted a full-time team of herpetologists to track the status and implement conservation of Arizona's ranid frogs. Status work accomplished from 1990 to 1997 by the AGFD in Arizona is summarized by Sredl *et al.* (1997), and included intensive frog inventories at 75 percent of historical Chiricahua leopard frog sites as well as many other wetland sites in Arizona. This work occurred at the same time others were searching for leopard frogs at new and historical Chiricahua leopard frog sites in Arizona (e.g. Rosen *et al.* 1996a&b, 1994, Snyder *et al.* 1996, Fernandez and Rosen 1996, Fernandez and Bagnara 1995, Zweifel 1995, Hale 1992, Clarkson and Rorabaugh 1991, Wood 1991).

In New Mexico, Scott (1992) thoroughly surveyed potential Chiricahua leopard frog habitats in southwestern New Mexico. Jennings (1995) surveyed 50 (82 percent) of the 61 historic sites identified by Fritts *et al.* (1984) as well as 22 other wetland sites. Additional surveys have been conducted since Jennings' work by New Mexico Department of Game and Fish, the Gila National Forest, Barney Tomberlin, Bureau of Land Management, the Animas Foundation, Andy Holycross, personnel at the Ladder Ranch, and others, as summarized in Table 4 of Painter (2000). Since the proposed rule was published, Forest Service biologists have become more aware of the species and have been looking for leopard frogs throughout the forests of Arizona and New Mexico. The surveys upon which this rule is based were conducted by qualified biologists, and the majority were by experts on the species.

In summary, more than 75 percent of the historical sites have been resurveyed for Chiricahua leopard frogs. Frogs were not found at more than 75 percent of those resurveyed sites. We acknowledge that the species probably occurs at some unsurveyed sites. However, the results of the historical site surveys present a convincing argument that the species is declining across its range in Arizona and New Mexico. Furthermore, every

recent report that discusses the status of the species concludes it is in decline. As discussed in the ''Background'' section, the frog's apparent disappearance from significant portions of its range argues that the declines are not the result of normal population fluctuations, but represent real, regional declines and loss of populations and metapopulations. Commenter's contention that only a small percentage of stock tanks in Arizona and New Mexico have been surveyed for Chiricahua leopard frogs is inaccurate. Many of the historical and new sites that have been surveyed for frogs are stock tanks. Also, only a small percentage of stock tanks have any potential to support populations of this frog. These are stock tanks within the range of the frog, from 1,000 to 2,710 m (3,280–8,890 ft) in elevation, and which hold water most of the time. Surveys for frogs have focused on this category of stock tank. The potential for finding many new populations on private lands is small, because most of the habitat and potential habitat of the Chiricahua leopard frog occurs on National Forests. Two of the most important private parcels within the range of the frog (Gray Ranch and Ladder Ranch in New Mexico) have been recently surveyed for frogs.

Commenters accurately identified a gap in our knowledge of the species' status in Mexico. As discussed in the ''Background'' section, limited surveys have been conducted in Mexico, and unresolved taxonomic questions and possible misidentification of frogs are apparent problems. However, declines or the causes of decline do not stop at the international boundary as shown by the fact that the Mexican Government considers the Chiricahua leopard frog a threatened species (Secretario de Desarrollo Social 1994). Our designation of the frog as a threatened species is consistent with the findings of Mexican biologists and the Mexican Government.

Commenters are also correct in stating that research into the causes of population loss and decline are incomplete, and compelling evidence linking declines with causal factors is often missing or speculative. However, as discussed in the ''Background'' section and the ''Summary of Factors Affecting the Species'' section, abundant data support the contention that populations of Chiricahua leopard frogs are eliminated by a variety of introduced, nonnative vertebrate and invertebrate predators, and that these predators are widespread in Arizona and New Mexico. However, Chiricahua leopard frogs have disappeared from many locations where nonnative predators are absent and no other causes of extirpation are apparent. Chytridiomycosis has played a part in these mysterious declines, but a myriad of other causal factors may be involved as well. As a result, discussions of the threats to the species herein are appropriately and often punctuated by uncertainty qualifiers such as ''may'' and ''could.'' The fact that we cannot always identify the causes of decline does not negate a large body of evidence that the species is declining and threatened throughout a significant portion of its range, and thus warrants listing.

Issue 6: Peer reviews and regulatory compliance documents should be made available for public review and comment prior to making a listing decision. Several commenters stated that peer reviews and regulatory compliance documents should be made available to the public for review and comment before a final decision regarding listing.

Response: In accordance with policy promulgated July 1, 1994 (59 FR 34270), we solicited the expert opinions of four appropriate and independent specialists regarding this proposed rule. The purpose of such review is to ensure listing decisions are based on scientifically sound data, assumptions, and analyses, including input of appropriate experts and specialists. Our four peer reviewers submitted comments during the public comment periods. As stated in the proposed rule, these and other comments received were and still are available for public review. Although, if individual respondents request that we withhold their home address or identity, we honor such requests to the extent allowable under the law. Public review and comment was and is possible, but any such comments would need to have been submitted during a comment period to be included in the administrative record and considered in our listing decision. We frequently reopen comment periods if needed to include substantive comments in the administrative record; however, we did not receive any comments after the close of the second and last comment periods; thus there was no need to reopen the comment period.

In the issuance of rules under the Act we are required to ensure compliance with applicable regulations. Required determinations under these regulations were presented in the proposed rule for the Paperwork Reduction Act of 1995 and Civil Justice Reform Executive Order. Our determinations under these regulations were available for comment; however, we received no comments pertaining to them.

We also indicated in the proposed rule that we would publish an analysis of how the special rule complies with various laws and Executive Orders. However, these regulations and Executive Orders, which include the Small Business Regulatory Enforcement Fairness Act, the Regulatory Flexibility Act, Executive Order 12866 (Regulatory Planning and Review),Unfunded Mandates Reform Act, Executive Order 12630 (Takings Assessment), Executive Order 13132 (Federalism), and Executive Order 13211 (dealing with regulations that significantly affect energy supply, distribution, and use), address economic and other issues not related to science. Section 4(a) of the Act requires that listing decisions be made solely on the best scientific and commercial (i.e., trade) data available. Therefore Section 4(a) of the Act supersedes the Executive Orders and statutes listed above which would otherwise require the Service to consider economic and other aspects of the special rule as an integral part of the listing decision. As a result, Service policy, as outlined in the Endangered Species Listing Handbook, 1994, indicates that special rules being published contemporaneously with a listing do not include an analysis of these various laws and Executive Orders. Thus, the Service will not be publishing an analysis of how this special rule complies with these various laws and Executive Orders.

Issue 7: One commenter asked how the rule will affect the quality of the human environment, particularly how industry and recreation will be affected.

Response: This is a question typically addressed in National Environmental Policy Act (NEPA) documents. As stated herein and in the proposed rule, NEPA documents are not required in connection with regulations such as this adopted pursuant to section 4(a) of the Act.

Issue 8: Listing, even with adoption of the special rule, will unnecessarily burden or threaten the livelihood of ranchers and cattle operations. Several commenters were concerned that regulations put in place by listing the Chiricahua leopard frog would add additional burden to an already over-regulated livestock industry. One commenter believed listing the frog would result in elimination of grazing on Federal lands. Another commenter was concerned that listing could result in different management of stock tanks on private versus Federal lands within the same ranch, causing management and resource conflicts. One commenter

was concerned that the rights of Federal livestock permittees are not guaranteed in the section 7 process.

Response: We recognize the importance of stock tanks as habitat for the Chiricahua leopard frog. Stock tanks are small earthen ponds created when a rancher builds up a barrier of soil to capture water from a small drainage area. These tanks would not have been built nor maintained without active grazing programs and viable ranches. Although livestock programs help create and maintain habitat, as discussed in the ''Summary of Factors Affecting the Species'' section, some adverse effects can occur from grazing programs, such as watershed degradation, riparian habitat loss, trampling of frogs, eggs, and tadpoles, and spread of disease. When a Federal action, such as permitting livestock grazing on Federal lands, may affect a listed species, consultation between us and the action agency is required pursuant to section 7 of the Act. The conclusion of consultation may include mandatory changes in livestock programs in the form of measures to minimize take of a listed animal or to avoid jeopardizing the continued existence of a listed species. Changes in a proposed action resulting from consultations are almost always minor. Since the Chiricahua leopard frog was proposed for listing, we have conducted a number of section 7 conferences with the Forest Service in regard to grazing in Chiricahua leopard frog habitat. None of these conferences have concluded that grazing would jeopardize the continued existence of the Chiricahua leopard frog. Where grazing would affect occupied habitat we have in some cases anticipated that take of Chiricahua leopard frogs would occur, and included measures to minimize that take. These measures have included, for instance, guidelines for stock tank maintenance, guidelines for cleaning or drying equipment and gear used at one tank before using it at another tank as a means of preventing disease transmission, and preconstruction surveys for frogs in areas to be affected by range improvement projects. In no case have we required changes in stocking rates, use of pastures, or utilization rates, or made other major modifications to livestock operations during the section 7 process.

We cannot predetermine the outcome of section 7 consultations, but because the Chiricahua leopard frog coexists with grazing throughout its range, we believe the likelihood of a biological opinion with a jeopardy conclusion is low. In those cases in which we anticipate that take of Chiricahua leopard frogs would occur, any reasonable and prudent measures, along with terms and conditions, identified to minimize take cannot alter the basic design, location, scope, duration, or timing of an action and may involve only minor changes (50 CFR 402.14(i)(2)). A permittee can ensure that his or her rights and concerns in the section 7 consultation process are addressed to the maximum extent possible under the law by applying for applicant status with the action agency pursuant to 50 CFR 402.14. Applicant status guarantees permittees certain rights in the section 7 process, such as submitting information, having veto power over requests for extensions of the consultation period beyond 60 days, and reviewing and commenting on draft biological opinions.

In regard to grazing activities on non-Federal lands, the special rule provides an exemption from the section 9 take prohibitions for operation and maintenance of stock tanks. These are the ranching activities on non-Federal lands most likely to take a Chiricahua leopard frog. By providing this exemption, we acknowledge the importance of these tanks to the conservation of the species, and that populations of frogs can coexist with use and maintenance of the tanks. If other non-Federal ranching activities may result in take of Chiricahua leopard frogs, these activities may be permitted by the Service by issuance of an incidental take permit to the landowner pursuant to section 10(a)(1)(B) of the Act.

Issue 9: One commenter believed that our assertion in the proposed rule that tadpoles may be trampled by cattle is overly speculative.

Response: There are no observations of trampling that we are aware of with regard to grazing of cattle and Chiricahua leopard frogs. However, in southeastern Idaho, hundreds of metamorphosing western toads (*Bufo boreas*) were trampled when a large herd of sheep were driven through a pond that had dried 4 days earlier. The majority of the young toads at the pond were left dead or dying; however, at least some adult toads escaped injury by hiding under logs or in rodent burrows (Bartelt 1998). Nevertheless, we believe this observation from Idaho supports our contention that certain life stages of the Chiricahua leopard frog are probably trampled by cattle at livestock tanks and in other habitats where cattle have access to aquatic habitats used by this frog. Discussions in the ''Summary of Factors Affecting the Species'' section describe other ways that direct mortality of frogs may occur from livestock grazing. Despite these potentially adverse effects from livestock grazing, we recognize the importance of stock tanks as providing additional habitat for the Chiricahua leopard frog and find that an overall conservation benefit occurs from the maintenance of these stock tanks. We do not believe that cattle trampling alone would lead to the extirpation of a population of Chiricahua leopard frogs.

Issue 9: We did not follow regulations pertaining to required notifications and public participation. One commenter stated that we did not provide notice of the proposed rule to State agencies and countries, or publish a summary in each area in which the frog occurs, in accordance with 16 U.S.C. 1533(b)(5). Another commenter believed we did not provide for adequate public participation in the rulemaking process, and criticized us for only providing 12 to 15 days notice of the public hearings. Commenters contend that hearings were held at night in driving rain storms, which was inconvenient, and notices of extension of the comment period included 2 deadline dates, which was confusing.

Response: Procedures for public participation and review in regard to proposed rules are defined at section 4(b)(5) of the Act, 50 CFR 424, the Administrative Procedure Act (5 U.S.C. 551 *et seq.*), and other applicable law. In response to commenters' specific comments, notice of publication of the proposed rule, which included a web address where the rule could be viewed or downloaded, was mailed on June 20, 2000, from our Phoenix Office to 149 agencies, organizations, and individuals, including 3 Arizona State agencies and 3 New Mexico State agencies, and a Federal and State agency in Mexico. Summaries of the proposed rule were published in the form of legal notices in 9 newspapers in Arizona and New Mexico, as described in the beginning of this section. We also provided news releases to newspapers and news services, and a number of newspaper articles were published describing the frog, its status, and the proposed rule. Similar notifications were provided for the reopening of the comment period.

Weather may have been a factor in the low turnout at the public hearing in Bisbee, AZ. As the commenter noted, heavy rain may have kept some people from coming, especially if they had to drive more than a few miles. In contrast, the weather in Silver City, NM, was good on the day of the hearing. We held the hearings in the evening (7:00–9:00 p.m.) because most people work or have other commitments during the day. The

September 27, 2000, **Federal Register** included two notices of the reopening of the comment period, announcement of the public hearings, and clarification of the special rule. The first stated the comment period was reopened until November 13, 2000; the second stated comments were due on October 27, 2000. We accepted comments until November 13, and we did not receive any comments after the close of the comment period. We made it clear at the public hearings and in the legal notices and news releases announcing the hearings that the comment period was open until November 13. We agree that this may have been confusing to some people, but if someone had only seen the **Federal Register** notice that comments were due October 27, and submitted comments in accordance with that incorrect notice, their comments were still accepted and entered into the administrative record.

Public notices were published in Bisbee, AZ, and Silver City, NM, 12 days prior to the public hearings in those cities. A **Federal Register** notice announcing the reopening of the comment period, the public hearing, and a clarification of the special rule was published 13 days prior to the hearing in Silver City and 14 days prior to the hearing in Bisbee. We believe on the whole the public had ample notice of the hearings and ample opportunity to comment on the rule, both orally at public hearings and in written comments. The Act only requires that one public hearing be held, if requested (section 4(b)(5)(E)). We held two hearings. Notification was provided both in the **Federal Register** and in newspaper notices in seven newspapers. We also sent a news release to 45 news outlets servicing communities in the historical range of the Chiricahua leopard frog, and we published articles on October 5, 2000, in Bisbee, AZ, and October 2, 2000, in Silver City, NM, announcing the hearings and discussing the proposed rule. On September 27, 2000, we mailed an announcement of the hearings, reopening of the comment period, and clarification of the proposed special rule to 163 individuals, organizations, and government agencies within the historical range of the frog. Furthermore, our regulations only requires a 60-day comment period on proposed rules (50 CFR 424.16 (c)(2)). The comment period on the Chiricahua leopard frog proposed rule was initially open for 120 days, and then reopened for 45 days, for a total of 165 days. In conclusion, we maintain that the public had ample opportunity to comment on the proposed rule, and ample notification that comments were being solicited.

Issue 10: Critical habitat should be designated. Commenters stated that, without critical habitat, section 7 will only protect currently occupied habitat, which is insufficient for medium- or long-term survival of the species. One of our peer reviewers suggested we designate only the unoccupied major recovery areas as critical habitat. The reviewer argues that if only major, unoccupied recovery areas are designated as critical habitat, these areas and their recovery potential would be protected under the section 7 consultation regulations, but the location of occupied sites would not be revealed. The reviewer recommends several valley bottom cienega complexes and montane canyons in southeastern Arizona for designation as critical habitat.

Response: Our rationale for determining that designation of critical habitat is not prudent is grounded in the concern that publication of maps and locations of Chiricahua leopard frogs will increase threats of collection, vandalism, and disease transmission for this species (see the ''Critical Habitat'' section of this rule). These threats would only be a concern where the frog actually occurs.

The Chiricahua leopard frog is largely absent from rivers, springs, cienegas, and other valley wetlands, as well as many of the major montane canyons of southeastern Arizona. Historically, these areas were probably very important and may have contained the largest, most stable populations of the Chiricahua leopard frog in southeastern Arizona. Most are now dominated by nonnative predators that have apparently excluded the Chiricahua leopard frog (Rosen *et al.* in press, 1996a, 1994). This scenario has been repeated elsewhere within the range of the Chiricahua leopard frog.

Critical habitat is habitat that is essential to the conservation of the species (section 3 of the Act; see ''Critical Habitat'' section herein). Because of the presence of a variety of nonnative predators, most of the sites suggested by the reviewer for designation of critical habitat do not currently contain features that are essential to the conservation of the Chiricahua leopard frog. Whether these sites are capable of being restored is unknown. The presence of a variety of nonnative predators with very different life histories make restoration especially challenging. For example, although bullfrogs can be eliminated from small, simple aquatic systems (Schwalbe and Rosen 2001, Schwalbe *et al.* 2000), we currently do not know how to remove them from large, complex aquatic systems. We also do not know how to control crayfish, even on a relatively small scale, and both the bullfrog and crayfish can live in, at least for a while, and disperse through terrestrial habitats. Our ability to control nonnative fish is better, but accomplishing fish control in a large system would be challenging, at best. A further problem would be preventing the reintroduction of these species, if we were successful at initially removing them. As a result, we do not know if the areas described by the reviewer can ever support Chiricahua leopard frogs in the future, and thus whether they are essential for the conservation of the species is questionable. If we were successful at eliminating nonnative predators and Chiricahua leopard frogs recolonized or were reestablished in these areas, then our concern about vandalism, collection, and disease transmission would extend to these areas, as well as the sites occupied today, and our rationale for not designating critical habitat in currently occupied sites would extend to these newly-occupied habitats.

In the absence of critical habitat designation, many of the areas referred to by the peer reviewer will be protected as a result of the presence of other critical habitat designations and listed species that require healthy riparian systems, special management that is typically extended to riparian and aquatic sites on Forest Service and Bureau of Land Management lands, and protection afforded by section 404 of the Clean Water Act and other regulations. In addition, if a site has potential to support Chiricahua leopard frogs, and the species may be present, a Federal action agency should still consult with us pursuant to section 7 of the Act if the actions of that agency may affect the survival or recovery of the frog via effects to its habitat.

In time, our ability to control nonnative predators should improve, and our understanding of the conservation needs of the Chiricahua leopard frog will be honed. The need for critical habitat will be revisited during preparation of a recovery plan for the species, and if new information becomes available suggesting designation of critical habitat is prudent, we may revisit a critical habitat designation at that time.

Peer Review

In accordance with our July 1, 1994 (59 FR 34270), Interagency Cooperative Policy on Peer Review, we requested the expert opinions of four independent specialists regarding pertinent scientific

or commercial data and assumptions relating to supportive biological and ecological information in the proposed rule. The purpose of such review is to ensure that the listing decision is based on scientifically sound data, assumptions, and analyses, including input of appropriate experts and specialists.

We requested four individuals who possess expertise on Chiricahua leopard frog natural history and ecology to review the proposed rule and provide any relevant scientific data relating to taxonomy, distribution, or to the supporting biological data used in our analyses of the listing factors. We received peer reviews from all entities (including AGFD). All agreed that the Chiricahua leopard frog is in decline over all or significant portions of its range and faces considerable threats where it still exists. AGFD favored conservation agreements over Federal listing as a means to recover the species; the other reviewers believed the frog should be listed as a threatened species. We have carefully considered and incorporated peer reviewers' comments into the final rule, as appropriate. We briefly summarize their observations below.

One of the peer reviewers recommended designation of critical habitat (that comment is addressed above); the other reviewers did not address critical habitat. One of the reviewers did not object to the special rule, two others supported it, and the fourth recommended expanding its scope (comment addressed above). Two of the peer reviewers provided documentation of recent die-offs or extirpations in New Mexico at three sites near Hurley and a fourth site on the Mimbres River. Chytridiomycosis was confirmed at one of the sites, and the pattern of decline at the other three suggests chytridiomycosis may be involved there as well. One of the reviewers emphasized that chytridiomycosis is emerging as a viable explanation for observed patterns of Chiricahua leopard frog declines. Small populations that are isolated, such as in remote stock tanks, may be less susceptible to contracting chytridiomycosis than large populations of frogs or individuals in metapopulations, in which the likelihood of disease transmission is much greater. This perspective tempers current thought that metapopulations are crucial to survival of the frog, but may help explain why Chiricahua leopard frog populations are often small and isolated, and why metapopulations are so rare. The reviewer notes further that the growth of chytrids is retarded by warm waters, which may help explain why Chiricahua leopard frogs have persisted at some geothermal springs in New Mexico. One of the reviewers provided the following new survey data for New Mexico: during May to August 2000, the frog was found at only 8 of 34 sites at which the species had been found from 1994 to 1999. This same reviewer described two proposed mining projects in New Mexico that may adversely affect Chiricahua leopard frogs and their habitats.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, we have determined that the Chiricahua leopard frog should be classified as a threatened species. We followed the procedures found at section 4(a)(1) of the Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR part 424) issued to implement the listing provisions of the Act. We may determine a species to be endangered or threatened due to one or more of the five factors described in section 4(a)(1). These factors and their application to the Chiricahua leopard frog (*Rana chiricahuensis* Platz and Mecham) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* Riparian and wetland communities throughout the range of the Chiricahua leopard frog are much altered and reduced in size compared to early- to mid-19th century conditions (Arizona Department of Water Resources 1994; Brown 1985; Hendrickson and Minckley 1984; Minckley and Brown 1982). Dams, diversions, groundwater pumping, introduction of nonnative organisms, woodcutting, mining, contaminants, urban and agricultural development, road construction, overgrazing, and altered fire regimes have all contributed to reduced quality and quantity of riparian and wetland habitat (Belsky and Blumenthal 1997; Wang *et al.* 1997; DeBano and Neary 1996; Bahre 1995; Brown 1985; Hadley and Sheridan 1995; Hale *et al.* 1995, Ohmart 1995; Stebbins and Cohen 1995; Hendrickson and Minckley 1984; Arizona State University 1979; Gifford and Hawkins 1978).

Many of these changes began before ranid frogs were widely collected or studied in Arizona and New Mexico. The Chiricahua leopard frog may have been much more widely distributed in pre-settlement times than is indicated by historical collections. Extant sites are generally located in stream and river drainage headwaters, springs, and stock tanks. However, historical records exist for the Verde, San Pedro, Santa Cruz, and Gila Rivers, and the species is extant in the San Francisco and Mimbres Rivers in New Mexico and on the Blue River in Arizona. This suggests that it may have occurred in other major drainages such as the mainstems of the Salt, White, Black, and Little Colorado Rivers. The species is also now largely absent from valley bottom cienega complexes in southeastern Arizona, which likely contained large populations historically (Rosen *et al.* in press). Habitat degradation, diversions, loss or alteration of stream flows, groundwater pumping, introduction of nonnative organisms, and other changes are often most apparent on these larger drainages and cienega complexes (Sredl *et al.* 1997, State of Arizona 1990, Hendrickson and Minckley 1984).

Although the cumulative effect of such changes to its habitat is unknown, the extirpation of the Chiricahua leopard frog may have occurred in some major drainages and cienegas prior to its occurrence being documented. Large drainages connect many of the extant and historical populations and may have served as important corridors for exchange of genetic material. Riverine and cienega populations probably served as a source of frogs for recolonization if extirpations occurred within satellite populations (Sredl *et al.* 1997, Rosen *et al.* 1996a).

Beavers (*Castor canadensis*) likely promoted the creation of Chiricahua leopard frog habitat. The activities of beavers tend to inhibit erosion and downcutting of stream channels (Parker *et al.* 1985) and ponded water behind beaver dams is favored habitat for ranid frogs. However, beavers were extirpated from some areas by the late 1800s and are still not abundant or are extirpated from other areas where they were once common (Hoffmeister 1986). For example, in Arizona beavers are extirpated from the Santa Cruz River and, before recent reestablishments, were extirpated from the upper San Pedro River. Loss of this large mammal and the dams it constructed likely resulted in loss of backwaters and pools favored by the Chiricahua leopard frog.

These changes occurred before leopard frogs were widely collected; thus, hypotheses concerning correlations between extirpations of beaver and Chiricahua leopard frogs cannot be tested by comparing historical versus extant frog populations. Where beavers occur within the range of the Chiricahua leopard frog today, beaver ponds are often inhabited by nonnative predators, such as introduced fishes and bullfrogs, that prey upon and preclude

viable populations of Chiricahua leopard frogs. Because nonnative species often thrive in beaver ponds, the presence of beavers could actually hinder recovery of the Chiricahua leopard frog in some systems.

As discussed above in Issue 8 of the comments section, small earthen ponds commonly known as stock tanks, constructed as water sources for livestock, are important habitats for the Chiricahua leopard frog, particularly in Arizona (Sredl and Jennings in press, Sredl and Saylor 1998). In some areas, stock tanks replaced natural springs and cienegas or were developed at spring headwaters or cienegas and now provide the only suitable habitat available to the Chiricahua leopard frog. For instance, the only known sites of the Chiricahua leopard frog in the San Rafael and San Bernardino valleys, Buckskin Hills, and in the Patagonia Mountains of Arizona are stock tanks. For example, data suggest Arizona populations of this species have fared better in stock tanks than in natural habitats. In Arizona, Sredl and Saylor (1998) found a significantly higher proportion (63 percent) of known extant Chiricahua leopard frog populations in stock tanks as compared to riverine habitats (35 percent), suggesting Arizona populations of this species have fared better in stock tanks than in natural habitats. However, this generalization does not hold for New Mexico, where in recent years many stock tank populations were extirpated, apparently by disease (Painter 2000). Sredl and Saylor (1998) found that stock tanks in Arizona are occupied less frequently by nonnative predators (with the exception of bullfrogs) than natural sites. For all these reasons, there is a high probability that the Chiricahua leopard frog would be extirpated from many more areas if ranchers had not built and maintained stock tanks for livestock production.

Although stock tanks provide refugia for frog populations and are important for this species in many areas, only small populations are supported by such tanks and these habitats are very dynamic. Tanks often dry out during drought, and flooding may destroy downstream impoundments or cause siltation, either of which may result in loss of aquatic communities and extirpation of frog populations. Periodic maintenance to remove silt from tanks may also cause a temporary loss of habitat and mortality of frogs. Populations of nonnative introduced predaceous fishes, bullfrogs, and other species, although less prevalent than in natural habitats, sometimes become established in stock tanks and are implicated in the decline of the Chiricahua leopard frog (Rosen *et al.* 1996a, 1994). Stock tanks may facilitate spread of infectious disease and nonnative organisms by providing habitats for frogs in arid landscapes that otherwise may have served as barriers to the spread of such organisms. In New Mexico, stock tank populations in some areas were apparently eliminated by disease (Painter 2000, Declining Amphibian Populations Task Force 1993). Sredl and Saylor (1998) caution that stock tank populations are sometimes simply mortality sinks with little reproduction or recruitment.

The effects of livestock grazing on leopard frog populations are not well-studied; however the Chiricahua leopard frog coexists with grazing activities throughout its range. For instance, a large and healthy population of Chiricahua leopard frogs coexists with cattle and horses on the Tularosa River, New Mexico (Randy Jennings, Western New Mexico University, pers. comm. 1995). A metapopulation of Chiricahua leopard frogs exists in stock tanks on allotments in the Buckskin Hills of the Coconino National Forest, Arizona. Maintenance of viable populations of Chiricahua leopard frogs is thought to be compatible with well-managed livestock grazing, and as discussed, stock tanks are currently important leopard frog habitats, particularly in Arizona. However, adverse effects to the species and its habitat may occur under certain circumstances (Sredl and Jennings in press). These effects include deterioration of watersheds, erosion and/or siltation of stream courses, elimination of undercut banks that provide cover for frogs, loss of wetland and riparian vegetation and backwater pools, and spread of disease and nonnative predators (Sredl and Jennings in press, U.S. Fish and Wildlife Service 2000, Belsky *et al.* 1999, Jancovich *et al.* 1997 Ohmart 1995; Hendrickson and Minckley 1984; Arizona State University 1979). Increased watershed erosion caused by grazing can accelerate sedimentation of deep pools used by frogs (Gunderson 1968). Sediment can alter primary productivity and fill interstitial spaces in streambed materials with fine particulates that impede water flow, reduce oxygen levels, and restrict waste removal (Chapman 1988). Eggs, tadpoles, metamorph frogs, and frogs hibernating at the bottom of pools or stock tanks are probably trampled by cattle (US Fish and Wildlife Service 2000, Bartelt 1998).

In June 1994, a die-off of Chiricahua leopard frogs occurred at a stock tank in the Chiricahua Mountains, Arizona, that reduced the frog population from 60 to 80 adults to fewer than 10 (Sredl *et al.* 1997). Analysis of dead and moribund frogs and water from the tank indicated that disease was unlikely to be the cause of the die-off; however, levels of hydrogen sulfide were high enough to be toxic to wildlife. The authors suspected that high detritus loads (including cattle feces), low water levels, high water temperature, and low concentrations of dissolved oxygen created a suitable environment for sulphur-producing bacteria that produced toxic levels of hydrogen sulfide. Chiricahua leopard frogs were not found at this site in 1998.

Many large impoundments or lakes were created within the range of the Chiricahua leopard frog for water storage, recreation, and as a source of hydroelectric power. For instance, historical records exist for the species from Luna Lake, Nelson Reservoir, Hawley Lake, and Rainbow Lake north of the Gila River in Arizona; and Lake Roberts, Patterson Lake, and Ben Lilly Lake in New Mexico, but surveys at these sites since 1985 located no frogs (Painter 2000, AGFD 1997). Currently, large impoundments invariably support populations of predaceous nonnative fishes, crayfish, and/or bullfrogs. Predation and possibly competition with leopard frogs likely caused or contributed to the disappearance of the Chiricahua leopard frog from reservoirs.

Construction and operation of reservoirs also alter downstream flows and can result in dramatic changes in stream hydrology, rates of erosion and sedimentation, riparian vegetation, and other components of riparian ecosystems (Johnson 1978). The effects of these changes on Chiricahua leopard frog populations are unknown. However, downstream effects of such impoundments are implicated in the decline of other anurans (frogs and toads), including the endangered arroyo toad (*Bufo californicus*) (Service 1993) and the foothill yellow-legged frog (*Rana boylii*) (Lind *et al.* 1996).

On the Trinity River in California, the extent of riparian vegetation increased with an accompanying decrease in sandbars, of which the latter was breeding habitat of the foothill yellow-legged frog. Unseasonably high flows from dam releases also resulted in loss of entire cohorts or age groups of larval frogs (Lind *et al.* 1996). Similar effects may occur in Chiricahua leopard frog habitats. Water temperatures are often colder below dams than in similar unaltered systems (Lind *et al.* 1996), which may retard development of frog eggs and larvae (Stebbins and Cohen 1995). Lack of scouring flood flows below dams may also create relatively

stable pools with abundant vegetation that favors establishment of bullfrogs (Lind *et al.* 1996). Dispersal of nonnative fish from impoundments to either downstream or upstream reaches may result in further adverse effects to frog populations.

Evidence of historical mining is commonly encountered within the range of the Chiricahua leopard frog, but few of these mines are currently active and most do not appear to directly affect the wetland and riparian areas occupied by the species. Only a few extant or historical Chiricahua leopard frog sites are thought to be currently directly affected by mining operations. Active mining occurs in California Gulch, Pajarito Mountains, AZ (an historical site), but is limited to a short reach of the drainage. Mining in the area of Hurley, NM, may affect Chiricahua leopard frogs in that area (if populations have not been eliminated by disease; R. Jennings, pers. comm. 2000). The recently proposed Gentry Iron Mine may be located within 1.6 km (1.0 mi) of two extant Chiricahua leopard frog populations on the Tonto National Forest, Arizona. The effects of that mine, if built, are unknown. In New Mexico, both the proposed expansion of the Santa Rita open-pit copper mine near Silver City, and a proposed beryllium mine on the south side of Alamosa Creek, may affect Chiricahua leopard frog populations in those areas (C. Painter pers. comm. 2000). The resulting effects of the proposed mining activities on these populations are uncertain at this time, but may include changes in water quality and flow rates.

In the past, spillage from mine leach ponds probably affected some Chiricahua leopard frog populations. In June 1969, leach ponds at a mine at Clifton, AZ, breached and spilled a heavy, red residue (probably iron oxide) into Chase Creek, which flowed for 4 miles to the San Francisco River. Rathbun (1969) estimated a nearly 100 percent kill of ''leopard'' frogs and tadpoles along the 4 mile reach of Chase Creek. Given the location and elevation of the site, the leopard frogs affected could have been lowland leopard frogs (*Rana yavapaiensis*) or Chiricahua leopard frogs. Overflow, leakage, and tailings dam failures at the copper mine at Cananea, Sonora, occurred several times from 1977 to 1979 and severely affected many miles of the upper San Pedro River in Sonora and Arizona. A spill in 1979 resulted in water that was brick red in color with a pH as low as 3.1. Aquatic life in the river was killed (U.S. Bureau of Land Management 1998). The last known occurrence of the Chiricahua leopard frog in the upper San Pedro River was 1979 (Service files).

Although mining activities were more widespread historically and may have constituted a greater threat in the past, the mining of sand and gravel, iron, gold, copper, beryllium, or other materials remains a potential threat to the Chiricahua leopard frog. In addition as noted in Factor C of this section, mining also has indirect adverse effects to this species.

Fire frequency and intensity in Southwestern forests are much altered from historic conditions (Dahms and Geils 1997). Before 1900, surface fires generally occurred at least once per decade in montane forests with a pine component. Beginning about 1870 to 1900, these frequent ground fires ceased to occur due to intensive livestock grazing that removed fine fuels coupled with effective fire suppression in the mid to late 20th century that further prevented frequent, widespread ground fires (Swetnam and Baisan 1996). Absence of ground fires allowed a buildup of woody fuels that precipitated infrequent but intense crown fires (Danzer *et al.* 1997, Swetnam and Baisan 1996). Absence of vegetation and forest litter following intense crown fires exposed soils to surface and rill (a channel made by a small stream) erosion during storms, often causing high peak flows, sedimentation, and erosion in downstream drainages (DeBano and Neary 1996). Following the 1994 Rattlesnake fire in the Chiricahua Mountains, Arizona, a debris flow filled in Rucker Lake and many pools in Rucker Canyon, both of which are historical Chiricahua leopard frog sites. Leopard frogs (either Chiricahua or Ramsey Canyon leopard frogs) apparently disappeared from Miller Canyon in the Huachuca Mountains, Arizona, following a 1977 crown fire in the upper canyon and subsequent erosion and scouring of the canyon during storm events (Tom Beatty, Miller Canyon, pers. comm. 2000). Leopard frogs were historically known from many sites in the Huachuca Mountains; however, natural pools and ponds are largely absent now and the only breeding leopard frog populations occur in man-made tanks and ponds. Bowers and McLaughlin (1994) list six riparian plant species they believed might have been eliminated from the Huachuca Mountains as a result of floods and debris flow following destructive fires.

Other activities have also affected the habitat of the Chiricahua leopard frog. For instance, in an attempt to increase flow, explosives were used at Birch Springs in the Animas Mountains, Hidalgo County, New Mexico, to open up the spring. The explosion resulted in destruction of the aquatic community, flows were reduced rather than increased, and Chiricahua leopard frogs subsequently disappeared (N. Scott, pers. comm. 1994). In the first half of 2001, Cuchillo Negro Spring in Sierra County, New Mexico, was excavated probably in an attempt to increase flows for downstream agricultural use. The spring, located on Bureau of Land Management lands, was occupied by Chiricahua leopard frogs prior to the excavation. Surveys in July 2001, after the excavation, failed to locate any Chiricahua leopard frogs, and pools that provided frog habitat had been largely destroyed (J. Rorabaugh, pers. obs. 2001).

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* The collection of Chiricahua leopard frogs in Arizona is prohibited by Arizona Game and Fish Commission Order 41, except where such collection is authorized by special permit. Collection of Chiricahua leopard frogs is also prohibited in Mexico. The collection or possession of Chiricahua leopard frogs is not prohibited in New Mexico.

Over-collection for commercial purposes is known to be a contributing factor in the decline of other ranid frogs (Jennings and Hayes 1985, Corn and Fogelman 1984). Although collection is not documented as a cause of population decline or loss in the Chiricahua leopard frog, Painter (2000) notes that individuals have repeatedly joked to him that these frogs make good bass bait. The collection of large adult frogs for food, research, pets, or other purposes, particularly after a winter die-off or other event that severely reduces the adult population, can hasten the extirpation of small populations. The listing of the Chiricahua leopard frog and its recognition as a rare species are reasonably expected to increase its value to collectors. In 1995, many large adult Ramsey Canyon leopard frogs (closely related to the Chiricahua leopard frog) were reportedly illegally collected from a site in the Huachuca Mountains, Arizona, following publicity about the rare status of the frog. Leopard frogs are common in the pet trade in the United States, and although we are not aware of U.S. commercial trade in Chiricahua leopard frogs, it may occur. Diaz and Diaz (1997) note that Chiricahua leopard frogs are sometimes sold in pet shops in Mexico, but, as discussed, the identity of these frogs is questionable.

C. *Disease or predation.* Predation by introduced, nonnative bullfrogs, fishes, tiger salamanders, and crayfish is

implicated as a contributing factor in the decline of ranid frogs in western North America (Fernandez and Rosen 1996, Bradford *et al.* 1993, Hayes and Jennings 1986, Moyle 1973), and may be the most important factor identified so far in the current decline of the Chiricahua leopard frog (Rosen *et al.* 1994, 1996a). In southeastern Arizona, Rosen *et al.* (1994, 1996a) documented 13 nonnative predaceous vertebrate species in aquatic communities in the range of the Chiricahua leopard frog, including bullfrog, tiger salamander, and 11 fish species including bass, trout, and catfish, among others.

Rosen *et al.* (1994, 1996a) found that Chiricahua leopard frogs were replaced by bullfrogs and centrarchid fish. Sixteen of 19 sites where Chiricahua leopard frogs occurred lacked nonnative vertebrates. All historical frog sites that lacked Chiricahua leopard frogs supported nonnative vertebrates. At the three sites where Chiricahua leopard frogs occurred with nonnatives (one site with green sunfish, *Lepomis cyanellus,* and two with tiger salamanders), either the frog or the nonnative vertebrate was rare. In two of the three cases, frogs may have derived from other nearby sites (Rosen *et al.* 1996a), and thus may have represented immigrants rather than a viable population.

In the San Rafael Valley, Arizona, Chiricahua leopard frogs were only found at sites that lacked nonnative fish and bullfrogs (Snyder *et al.* 1996). In the White Mountains of Arizona, disappearance of Chiricahua leopard frogs from most historical sites correlated with the appearance of tiger salamanders and nonnative crayfish (Fernandez and Rosen 1996, Fernandez and Bagnara 1995). Crayfish were found to prey upon Chiricahua leopard frog larvae, metamorphs, and adults. Crayfish recently spread to the breeding pond of one of the last and possibly the most robust populations of Chiricahua leopard frogs in the White Mountains, Arizona (M. Sredl, pers. comm. 1999, Fernandez and Rosen 1998), and are now very abundant in former Chiricahua leopard frogs habitats on the Blue River, Arizona (J. Platz, pers. comm. 2000).

Sredl and Howland (1994) noted that Chiricahua leopard frogs were nearly always absent from sites supporting bullfrogs and nonnative predatory fishes; however, Rosen *et al.* (1996a) suggested further study was needed to evaluate the effects of mosquitofish, trout, and catfish on frog presence. Rosen *et al.* (1996a) suspected that catfish would almost always exclude Chiricahua leopard frogs, and that trout may exclude leopard frogs.

The Rio Grande leopard frog (*Rana berlandieri*) is a recent introduction to southwestern Arizona and southeastern California (Platz *et al.* 1990). Although the species does not presently occur within the range of the Chiricahua leopard frog, it is rapidly expanding its distribution and currently occurs as far east as the Phoenix area (Rorabaugh *et al.* 2002). If it continues to spread eastward, the ranges of the Rio Grande and Chiricahua leopard frogs may overlap in the future. This large, introduced leopard frog might prey on small Chiricahua leopard frogs (Platz *et al.* 1990), and tadpoles of the two species may compete.

In contrast to nonnative aquatic vertebrates, numerous species of native fishes, the Sonoran mud turtle (*Kinosternon sonoriense*), other species of native ranid frogs, and native garter snakes commonly coexist with the Chiricahua leopard frog (Rosen *et al.* 1996a, Platz and Mecham 1979). Tiger salamanders are native to the following portions of the Chiricahua leopard frog's range: San Rafael Valley in southeastern Arizona (*Ambystoma tigrinum stebbinsi*), the northern portion of the species' range (*Ambystoma tigrinum nebulosum*), and the mountains of Sonora, Chihuahua, and Durango (*Ambystoma rosaceum*). Native fishes, such as trout (*Oncorhynchus*), chub (*Gila*), longfin dace (*Agosia chrysogaster*), and topminnow (*Poeciliopsis*), also occur within the range of the Chiricahua leopard frog.

Fish, frogs, and salamanders, both native and nonnative, may facilitate disease transmission among Chiricahua leopard frog populations. Bullfrogs, Rio Grande leopard frogs, lowland leopard frogs, Sonora tiger salamanders, and other species found with Chiricahua leopard frogs are known to contract chytridiomycosis (Davidson *et al.* 2000, Speare and Berger 2000, Sredl *et al.* 2000), and could conceivably transmit that disease or other diseases to Chiricahua leopard frogs. Kiesecker *et al.* (2001) showed that rainbow trout (*Oncorhynchus mykiss*) may serve as a vector for a pathogenic water mold, *Saprolegnia ferax,* that has been associated with embryonic mortality of amphibians in the Cascade Mountains of Oregon, suggesting stocking of game fishes could facilitate disease transmission, as well.

Postmetamorphic Death Syndrome (PDS) was implicated in the extirpation of Chiricahua leopard frog populations in Grant County, New Mexico, as well as in other frog and toad species. All stock tank populations of the Chiricahua leopard frog in the vicinity of Gillette and Cooney tanks disappeared within a three-year period, apparently as a result of PDS (Declining Amphibian Populations Task Force 1993). The syndrome is characterized by death of all or nearly all metamorphosed frogs in a short period of time, leaving only tadpoles surviving in the population. Dead or moribund frogs are often found during or immediately following winter dormancy or unusually cold periods. The syndrome appears to spread among adjacent populations causing regional loss of populations or metapopulations. Similar die-offs or spring absence of frogs were noted in Arizona and Sonora. Steve Hale (Tucson, AZ, pers. comm. 1994) noted that in some years, very few Chiricahua leopard frogs would occur in the canyons of the Santa Rita and Pajarito mountains in the spring, suggesting that frogs were dying during the winter months. The apparent post-metamorphic death of the Tarahumara frog was documented in southern Arizona and northern Sonora as early as 1974, and by 1983 this species had died out in Arizona (Hale 2001, Hale *et al.* 1995, Hale and Jarchow 1988).

Hale and Jarchow (1988) suggested arsenic and or cadmium poisoning might be contributing factors in these frog die-offs. Arsenic often occurs at high levels near sulfitic mine tailings and may be leached by rainfall containing elevated levels of sulfate (Hale and Jarchow 1988). Cadmium originating from airborne emissions from copper smelters in southern Arizona and northern Sonora was identified as another possible cause of mortality. Frogs appeared to persist most consistently at springs and headwaters where cadmium to zinc ratios were relatively low, which is consistent with the theory that contaminants were washing into streams and accumulating in downstream reaches. Precipitation collected in 1984 to 1985 in southeastern Arizona had a depth-weighted mean pH of 4.63 and carried high levels of sulfate, arsenic, cadmium, copper, lead, and zinc. High acidity and sulfate concentration occurred when upper-level winds were from the directions of copper smelters, particularly those at Douglas, AZ, and Cananea, Sonora (Blanchard and Stromberg 1987). In regard to the northern leopard frog, waters no more acidic than pH 6.0 are optimal for fertilization and early development (Schlichter 1981). When exposed to waters of pH 5.5 for 10 days, 72 percent of northern leopard frogs died, versus a control group held in pH 7.0 that exhibited 3.5 percent mortality (Vatnick *et al.* 1999). These results suggest that

precipitation may have been acidic enough to affect Chiricahua leopard frog reproduction and survival. Small aquatic systems, such as stock tanks, that could be swamped by runoff during heavy rainfall events are most likely to be affected. Stock tanks with pHs of less than 4 were noted in the late 1990s on the west slope of the Huachuca Mountains, Arizona, which is near the smelter at Cananea (M. Pruss, pers. comm. 1999). The smelters at Douglas and Cananea are now closed, thus we would expect a reduction or cessation of contaminant laden or acidic rainfall. How long it might take for residual elevated levels of cadmium, arsenic, and other smelter-related contaminants in the environment to disperse is unknown.

In the 1990s disease was recognized as a significant factor, if not the most important proximate factor, in global amphibian decline. In retrospect, the die-offs observed in New Mexico and attributed to PDS, and die-offs of leopard frogs and Tarahumara frogs described above in Arizona and Sonora, appear consistent with disease outbreaks elsewhere in the world. Lips (1998) documented reduced abundance and skewed sex ratios of two anuran species, and dead and dying individuals of six other amphibian species in Puntarenas Province, Costa Rica. Her observations were consistent with a pathogen outbreak, and recent evidence suggests chytridiomycosis may be responsible for the declines (Longcore *et al.* 1999, Berger *et al.* 1998). Lips (1998) noted that declines in her study area were similar to those reported for Monteverde, Costa Rica, the Atlantic coast of Brazil, and Australia. Amphibian decline in these areas spread wave-like across the landscape, suggestive of pathogen dispersal. Further work by Berger *et al.* (1998) showed that chytrid fungi were associated with amphibian declines in Panama and Queensland, Australia; the authors hypothesize it is the proximate cause of amphibian decline in these areas. Evidence now suggests chytridiomycosis is responsible for observed declines of frogs, toads, and salamanders in portions of Central America (Panama and Costa Rica), South America (Atlantic coast of Brazil, Ecuador, and Uruguay), Australia (eastern and western States), New Zealand (South Island), Europe (Spain and Germany), Africa (South Africa, ''western Africa'', and Kenya), Mexico (Sonora), and the United States (8 States) (Speare and Berger 2000, Longcore *et al.* 1999, Berger *et al.* 1998, Hale 2001). Ninety-four species of amphibians have been diagnosed as infected with the chytrid *Batrachochytrium dendrobatidis* (Hale 2001, Speare and Berger 2000). The proximal cause of extinctions of two species of Australian gastric brooding frogs and the golden toad (*Bufo periglenes*) in Costa Rica was likely chytridiomycosis. Another species in Australia for which individuals were diagnosed with the disease may now be extinct (Daszak 2000).

In Arizona, chytrid infections have been reported from four populations of Chiricahua leopard frogs. Two populations of the closely related Ramsey Canyon leopard frog have also been infected (M. Sredl, pers. comm. 2000). In New Mexico, chytridiomycosis was identified in a declining population near Hurley, and patterns of decline at three other populations are consistent with chytridiomycosis (R. Jennings, pers. comm. 2000). Retrospective analysis of Tarahumara frog specimens collected during a die-off in Sycamore Canyon, Arizona, in 1974 showed they were infected with chytrids (T.R. Jones and P.J. Fernandez, pers. comm. 2001), and the disease has now been confirmed from all Tarahumara frog declines and extirpations in Arizona and Sonora where specimens have been available for examination (Hale 2001). Although chytridiomycosis has been associated with Southwestern ranid frog declines and extirpations, the role of the fungi in the larger picture of frog population dynamics is as yet undefined. It is clear that Chiricahua leopard frog populations can exist with the disease for extended periods. The frog has coexisted with chytridiomycosis in Sycamore Canyon, Arizona, since at least 1974. However, at a minimum, it is an additional stressor, resulting in periodic die-offs that increase the likelihood of extirpation and extinction.

Although chytridiomycosis now appears to be the most likely proximate cause of ranid frog die-offs observed in Arizona and Sonora since the 1970s, Hale and Jarchow's (1988) contention that contaminants associated with copper smelters may have caused the die-offs should not be dismissed. In fact, many other environmental factors or stressors may interact with chytridiomycosis synergistically to either increase the virulence of the disease or compromise the immune systems of amphibians (Lips 1999). These factors or stressors may include increased levels of contaminants (such as cadmium, arsenic, pesticides and others), as suggested by Hale and Jarchow (1988), but also acidic rainfall, climate or microclimate (e.g., temperature, moisture) change, increased UV-B radiation, or other changes in habitats that cause stress and immunosuppression (Carey *et al.* 2001, 1999). Additional research is needed to determine how or if these factors are contributing, directly or indirectly, to the decline of the Chiricahua leopard frog.

D. *The inadequacy of existing regulatory mechanisms.* A variety of existing international conventions and law, and Federal and State regulations provide limited protection to the Chiricahua leopard frog and its habitat (Arizona Game and Fish Commission Order 41). State regulations prohibit collection or hunting of Chiricahua leopard frogs in Arizona, except under special permit. Collection is not prohibited in New Mexico, and although collecting has not been documented as a cause of population loss, the typically small, geographically isolated populations of this species are extremely vulnerable to collection pressure. Regulations have not been adequate to stem habitat loss and degradation or to address factors such as introduction of nonnative predators.

In Mexico, the collection of threatened species is prohibited; although individuals of this species have been reported in the Mexican pet trade (Diaz and Diaz 1997). The habitat of the Chiricahua leopard frog and other threatened species is protected from some activities in Mexico. The species is not protected by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which regulates international trade.

The Lacey Act (16 U.S.C. 3371 *et seq.*), provides some protection for the Chiricahua leopard frog. This legislation prohibits the import, export, sale, receipt, acquisition, purchase, and engagement in interstate or foreign commerce of any species taken, possessed, or sold in violation of any law, treaty, or regulation of the United States, any Tribal law, or any law or regulation of any State.

The Federal Land Policy Management Act of 1976 (43 U.S.C. 1701 *et seq.*) and the National Forest Management Act of 1976 (16 U.S.C. 1600 *et seq.*) direct Federal agencies to prepare programmatic-level management plans to guide long-term resource management decisions. In addition, the Forest Service is required to manage habitat to maintain viable populations of existing native and desired nonnative vertebrate species in planning areas (36 CFR 219.19). These regulations have resulted in the preparation of a variety of land management plans by the Forest Service and the Bureau of Land

Management that address management and resource protection of areas that support, or in the past, supported populations of Chiricahua leopard frogs.

Nineteen of 41 sites confirmed as supporting extant populations of the Chiricahua leopard frog in New Mexico from 1994 to 1999, and 47 of 87 sites occupied from 1994 to 2001 in Arizona, are on National Forest lands. Forty-three of these sites occur on the Coronado and Gila National Forests. Additional sites occur on the Apache-Sitgreaves, Tonto, and Coconino National Forests. As a result, Forest Service land management plans are particularly important in guiding the management of Chiricahua leopard frog habitat. However, these plans have not always adequately protected this species' habitat. Many activities that affect the Chiricahua leopard frog and its habitat are beyond Forest Service control. For instance, the Forest Service does not have the authority to regulate off-site activities such as atmospheric pollution from copper smelters or other actions that may be responsible for global amphibian declines, including that of the Chiricahua leopard frog. The Forest Service has only limited ability to regulate introductions or stockings of nonnative species that prey on Chiricahua leopard frogs. An effort is underway to restore natural fire regimes to forest lands, but at present it is focused on areas of urban interface, and many decades will likely pass before natural fire cycles are restored on a landscape scale across the Southwest. Despite extensive planning efforts by the Forest Service and implementation of management actions to protect wetlands and maintain viable populations of native species on Forest Service lands, loss of Chiricahua leopard frog populations and metapopulations continues.

The National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321–4370a) requires Federal agencies to consider the environmental impacts of their actions. NEPA requires Federal agencies to describe the proposed action, consider alternatives, identify and disclose potential environmental impacts of each alternative, and involve the public in the decision-making process. Federal agencies are not required to select the alternative having the least significant environmental impacts. A Federal action agency may select an action that will adversely affect sensitive species provided that these effects were known and identified in a NEPA document. Most actions taken by the Forest Service, the Bureau of Land Management, and other Federal agencies that affect the Chiricahua leopard frog are subject to the NEPA process.

State and Federal air quality regulations strictly regulate emissions from copper smelters, historically a major source of acidic rainfall and atmospheric cadmium and arsenic in southeastern Arizona, pollutants that may adversely affect the Chiricahua leopard frog (Hale and Jarchow 1988). However, a major source of these pollutants has been copper smelters in Cananea and Nacozari, Sonora; which are not subject to the same regulations as in the United States (Hale *et al.* 1995; Blanchard and Stromberg 1987).

Wetland values and water quality of aquatic sites inhabited by the Chiricahua leopard frog are afforded varying protection under the Federal Water Pollution Control Act of 1948 (33 U.S.C. 1251–1376), as amended; and Federal Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands). The protection afforded by these and other Federal laws and regulations discussed herein has not halted population extirpation and the degradation of the habitat of this species.

The AGFD included the Chiricahua leopard frog on their draft list of species of concern (AGFD 1996); however, this designation affords no legal protection to the species or its habitat. State of Arizona Executive Order Number 89–16 (Streams and Riparian Resources), signed on June 10, 1989, directs State agencies to evaluate their actions and implement changes, as appropriate, to allow for restoration of riparian resources. Implementation of this regulation may reduce adverse effects of some State actions on the habitat of the Chiricahua leopard frog. The New Mexico Department of Game and Fish does not consider the Chiricahua to be threatened or endangered. The Department also adopted a wetland protection policy in which they do not endorse nor take any action that would promote any private or public project that would result in a net decrease in either wetland acreage or wetland habitat values. This policy affords only limited protection to Chiricahua leopard frog habitat because it is advisory only; destruction or alteration of wetlands is not regulated by State law.

E. *Other natural or manmade factors affecting its continued existence.* Because of the inherent dynamic nature of southwestern wetland and riparian habitats, coupled with the increased likelihood of extirpation characteristic of small populations, the viability of extant populations of the Chiricahua leopard frog is thought, in many cases, to be relatively short. Approximately 38 percent of sites occupied by Chiricahua leopard frogs from 1994 to 2001 were artificial tanks or impoundments constructed for watering livestock. These environments are very dynamic due to flooding, drought, and human activities such as maintenance of stock tanks. In addition, stock tank populations are often quite small. Small populations are subject to extirpation from random variations in such factors as the demographics of age structure or sex ratio, and from disease and other natural events (Wilcox and Murphy 1985). Inbreeding depression and loss of genetic diversity may also occur in small populations of less than a few hundred individuals; such loss may reduce the fitness of individuals and the ability of the population to adapt to change (Frankel and Soule 1981). Both of these genetic considerations result in an increased likelihood of extirpation (Lande and Barrowclough 1987).

The dynamic nature of stock tank habitats and the small size of the populations that inhabit them suggest that many of these populations are not likely to persist for long periods. As an example, siltation and drought dramatically reduced the extent of surface water at Rosewood Tank in the San Bernardino Valley, Arizona (Matt Magoffin, San Bernardino National Wildlife Refuge, pers. comm. 1997). Surface water and habitat for frogs were reduced in June 1994 to a surface area of approximately 60 square feet that supported a population of approximately eight adult Chiricahua leopard frogs and several hundred tadpoles. In this instance the landowner was only able to prevent the population from being extirpated by repeated efforts to intervene on behalf of the Chiricahua leopard frog in trucking water to the site, rebuilding the tank, and constructing a small permanent pond to maintain habitat for the species.

Some larger populations occurring in stream courses or other non-stock tank habitats also experience dramatic changes in population size, such as in Sycamore Canyon in the Pajarito Mountains, Arizona, and on the eastern slope of the Santa Rita Mountains, Arizona (S. Hale, pers. comm. 1994). These aquatic systems, although much larger than a stock tank, experience dramatic environmental phenomena such as floods, drought, and in the case of Sycamore Canyon, varied zinc to cadmium ratios and chytridiomycosis, all of which may cause populations to crash. This suggests that even these relatively large and natural habitats and the frog populations they support are very dynamic. As a result of this dynamic nature, leopard frog

populations are susceptible to extirpation.

As discussed in the ''Background'' section of this final rule, the viability of metapopulations is probably very different than small, isolated populations. In the absence of infectious disease, metapopulations are more likely to persist over time than small, more isolated populations, because individuals and genetic material can be exchanged among populations within the metapopulation, resulting in increased recolonization rates and fewer potential genetic problems. If infectious disease, such as chytridiomycosis is introduced, metapopulation structure and exchange of individuals among populations would facilitate disease transmission, possibly resulting in regional die-offs or extirpation, such as was observed in stock tank populations in Grant County, New Mexico (Declining Amphibian Populations Task Force 1993). To define metapopulations of the Chiricahua leopard frog, some knowledge of the ability of this species to move among aquatic sites is required. Amphibians, in general, have limited dispersal and colonization abilities due to physiological constraints, limited movements, and high site fidelity (Blaustein *et al.* 1994); however, the ability of the Chiricahua leopard frog, thought to be one of the more aquatic of the leopard frogs, to move through arid environments may be surprising to many. In August 1996, Rosen and Schwalbe (1998) found up to 25 young adult and subadult Chiricahua leopard frogs at a roadside puddle in the San Bernardino Valley, Arizona. They believed that the only possible origin of these frogs was a stock tank located 5.5 km (3.4 mi) away. Rosen et al. (1996a) found small numbers of Chiricahua leopard frogs at two locations in Arizona that supported large populations of nonnative predators. The authors suggested these frogs could not have originated at these locations because successful reproduction would have been precluded by predation. They found that the likely source of these animals were populations 2 to 7 km (1.2 to 4.3 mi) distant. In the Dragoon Mountains, Arizona, Chiricahua leopard frogs breed at Halfmoon Tank, but frogs occasionally turn up at Cochise Spring (1.3 km (0.8 mi) down canyon in an ephemeral drainage from Halfmoon Tank) and in Stronghold Canyon (1.7 km (1.1 mi) down canyon from Halfmoon Tank). There is no breeding habitat for Chiricahua leopard frogs at Cochise Spring or Stronghold Canyon, thus it appears observations of frogs at these sites represent immigrants from Halfmoon Tank. Dispersal of Chiricahua leopard frogs probably occurs most often along drainages, particularly those with permanent water, but also along intermittent stream courses and overland during summer rains.

Where several populations of Chiricahua leopard frog occur in close proximity (separated by about 5 km or less), functional metapopulations may exist. Two areas of the Galiuro Mountains of Arizona have supported a total of 12 extant sites since 1994, including 4 sites in the northern end of the range and 8 in the southern end. A similar cluster of seven sites occurs in the Dragoon Mountains, AZ. In the Buckskin Hills of the Coconino National Forest, Arizona, 10 stock tank populations occur close enough together to consider them a metapopulation. Such metapopulations may exist elsewhere, for instance, in the southwestern quarter of the San Rafael Valley and the Crouch Creek area of Arizona, and in New Mexico, east and northeast of Hurley, and in the Frieborn Canyon-Dry Blue Creek area. However, with the exception of those in the Dragoon Mountains, the southern Galiuro Mountains, and the Buckskin Hills, metapopulations of which we are aware probably consist of five or fewer sites. Metapopulations, particularly the larger examples, are critical to long-term survival of the species. Also critical are large populations, such as on the Tularosa River, NM; and Sycamore Canyon and associated tanks in the Pajarito Mountains, AZ; which are expected to experience relatively low extinction rates and may serve as source populations for colonization of nearby suitable habitats. Unfortunately, these large populations and metapopulations, because they are not isolated, are the most likely to contract infectious disease. This increases our concern about disease and underscores the importance of minimizing the likelihood of human-caused disease transmission. Populations have recently declined or been extirpated near Hurley, and these declines are associated with chytridiomycosis. The metapopulation in the Galiuro Mountains may have also crashed recently, although the extent and cause of decline is unknown.

We carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by the Chiricahua leopard frog in developing this final rule. Based on this evaluation, our preferred action is to list the Chiricahua leopard frog as threatened. The Act defines an endangered species as one that is in danger of extinction throughout all or a significant portion of its range. The Act defines a threatened species as any species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. This species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and therefore meets the Act's definition of threatened.

Within its range in the United States, the Chiricahua leopard frog is believed absent from more than 75 percent of historical sites, and has undergone regional extirpation in areas where it was once well-distributed. The status of populations in Mexico is poorly understood, but the species is considered threatened by the Mexican Government. The species is not in immediate danger of extinction, because at least a few relatively robust populations and metapopulations still exist (e.g., Tularosa River, Dragoon Mountains, Buckskin Hills) and Chiricahua leopard frogs were found at 129 sites from 1994 to the present. However, if present threats and declines continue, the Chiricahua leopard frog is likely to become an endangered species in the foreseeable future (Painter 1996, Rosen et al. 1996a). Therefore, we believe that the Chiricahua leopard frog meets the definition of a threatened species under the Act.

Critical Habitat

Critical habitat is defined in section 3(5)(A) of the Act as—(i) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management consideration or protection; and (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon determination that such areas are essential for the conservation of the species. ''Conservation'' means the use of all methods and procedures that are necessary to bring an endangered species or a threatened species to the point at which listing under the Act is no longer necessary.

Section 4(b)(2) and 4(b)(6)(C) of the Act, as amended, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time the species is determined to be endangered or threatened. The designation of critical habitat is not prudent (50 CFR 424.12(a)(1)) when one or both of the following situations exist—(1) the

species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat, or (2) such designation would not be beneficial to the species.

Critical habitat designation would require publishing in the **Federal Register** locations of Chiricahua leopard frog populations and habitats essential for the conservation of the species. As discussed under Factor B in the ''Summary of Factors Affecting the Species,'' the Chiricahua leopard frog may be threatened by collection. Publishing site data would facilitate collection as it would provide collectors with specific, previously unknown, information about the location of this species. Collection has contributed to the decline of other rare anurans, including the endangered Wyoming toad (*Bufo hemiophrys baxteri*), threatened California red-legged frog (*Rana aurora draytonii*) (Stebbins and Cohen 1995, Jennings and Hayes 1995), and a number of other anuran species worldwide (Vial and Saylor 1993).

Scientists have not documented collection, to date, as a cause of population decline or loss in the Chiricahua leopard frog. However, such collection would be difficult to document and collection of large adult frogs for food, fish bait, pets, scientific, or other purposes, particularly after a winter die-off or other event that severely reduces the adult population, could hasten the extirpation of small populations. Recognition of the Chiricahua leopard frog as a threatened species may increase its value to collectors. The Chiricahua leopard frog is an attractive, often bright green frog that probably does quite well in captivity. The northern leopard frog, *Rana pipiens*, a very similar animal, is common in the pet trade and we are aware of internet trade in ''leopard frogs,'' which could include Chiricahua leopard frogs. Chiricahua leopard frogs should be as attractive as the northern leopard frog to collectors, or perhaps more so because of their rarity. Diaz and Diaz (1997) report sale of Chiricahua leopard frogs as pets in Mexico (although the identity of these frogs to species is questionable). Painter (2000) notes that individuals have repeatedly joked to him that these frogs make good ''bass-bait.''

Import and export data provided by our Division of Law Enforcement document a substantial amount of international trade in *Rana* spp. Specifically, for the period of January 1, 1996, to October 31, 1998, 9,997 live individuals of *Rana* spp. were imported and 51,043 live individuals were exported from the United States. Because shipments of wildlife from the United States are not as closely monitored as imports, and are sometimes not recorded to the genus level (this is also true for imports as well), the number of exports documented for this timeframe is likely an under representation of what actually occurred.

In 1995, many large adult Ramsey Canyon leopard frogs (which are very similar in appearance and closely related to the Chiricahua leopard frog) were reportedly illegally collected from a site in the Huachuca Mountains, Arizona, following publicity about the rare status of the frog (from Service notes of the May 25, 1995, meeting of the Ramsey Canyon Leopard Frog Conservation Team). The site, which occurs within the range of the Chiricahua leopard frog, was considered extirpated until Ramsey Canyon leopard frogs were reestablished in 2000. Collection probably contributed to the demise of this population. Following newspaper publicity regarding our proposal to list the Arroyo toad (*Bufo microscaphus californicus*), a former U.S. Forest Service employee found that a main pool near the road, formerly with a high density of calling males, was absent of males, some previously tagged. The tagged males could not be located elsewhere and it is not thought that their absence was due to natural movement or predation (Nancy Sandburg, U.S. Forest Service pers. comm. 1999). Publishing maps for the best populations and habitats of Chiricahua leopard frog could cause or contribute to similar declines or extirpations. The evidence shows, therefore, that threat of collection would increase substantially if we disclosed specific location information for all or the most important Chiricahua leopard frog populations and habitats.

Publishing site data could also facilitate vandalism of habitats where Chiricahua leopard frogs occur. Platz (1995) noted the disappearance of large tadpoles at a Ramsey Canyon leopard frog site in Brown Canyon, Huachuca Mountains in 1991–1992, and suggested their disappearance may have, in part, resulted from an act of vandalism. Many Chiricahua leopard frog habitats are small and could be easily contaminated with toxicants or taken over by nonnative predators, resulting in extirpation of frog populations. The majority of extant populations also occur on public lands (primarily National Forest lands) with public access routes that lead to the populations or pass nearby. Public access to these sites is reasonably expected to facilitate collections or vandalism.

Publishing maps of Chiricahua leopard frog sites could also facilitate disease transmission. Chytridiomycosis and other amphibian diseases can be spread by people visiting a Chiricahua leopard frog site. If a person visits a site where disease is present and then travels to another site, disease can be spread via muddy or wet boots, nets, vehicles or other equipment (Speare *et al.* 1998, David Green, National Wildlife Health Center, Madison, Wisconsin, pers. comm. 2000). Although other hypotheses have been proposed (Carey *et al.* 1999), Daszak *et al.* (1999) find that the pattern of amphibian deaths and population declines associated with chytridiomycosis is consistent with an introduced pathogen. The chytrid fungus is not known to have an airborne spore, but rather disperses between individuals and populations via zoospores that swim through water or during contact between infected animals (Daszak 1998). If chytridiomycosis is a recent introduction on a global scale, then dispersal by way of global or regional commerce, translocation of frogs and other organisms, and travel between affected and unaffected areas by anglers, scientists, tourists, and others are viable scenarios for transmission of this disease (Daszak *et al.* 1999, Halliday 1998). Furthermore, amphibians in the international pet trade (Europe and USA), outdoor pond supplies (USA), zoo trade (Europe and USA), laboratory supply houses (USA), and species recently introduced (cane toad (*Bufo marinus*) in Australia and bullfrog in the USA) have been found infected with chytrids, suggesting human-induced spread of the disease (Daszak 2000). Until the spread of chytridiomycosis is better understood, and the role of this and other diseases in the decline of the Chiricahua leopard frog is clarified, visitation of Chiricahua leopard frog sites should not be encouraged. Publishing maps of Chiricahua leopard frog sites could facilitate visitation by collectors or those who want to view the frog. Increased visitation increases the risk of infectious disease transmission. Because of a lack of isolation, metapopulations of frogs, which are critical to the survival and recovery of the Chiricahua leopard frog, may be most at risk from human-facilitated disease transmission.

The prohibition of destruction or adverse modification of critical habitat is provided under section 7 of the Act, and therefore only applies to actions funded, authorized, or carried out by Federal agencies. ''Destruction or adverse modification'' is defined under

50 CFR 402.02 as an action that appreciably diminishes the value of critical habitat for the survival and recovery of the listed species. Similarly, section 7 prohibits jeopardizing the continued existence of a listed species. ''Jeopardize the continued existence'' is defined as an action that would be expected to reduce appreciably the likelihood of survival and recovery of a listed species.

Given the similarity in the above definitions, in most cases Federal actions that would appreciably reduce the value of critical habitat for the survival and recovery of the Chiricahua leopard frog would also reduce appreciably the likelihood of survival and recovery of the species. The Chiricahua leopard frog occurs mostly in relatively small populations that are highly vulnerable to extirpation. Habitat alteration of a severity to result in destruction or adverse modification of critical habitat would likely also jeopardize the continued existence of the species. Similarly, reasonable and prudent alternative actions that would remove the likelihood of jeopardy would also remove the likelihood of destruction or adverse modification of critical habitat. While a critical habitat designation for habitat currently occupied by this species would not be likely to change the section 7 consultation outcome because an action that destroys or adversely modifies such critical habitat would also be likely to result in jeopardy to the species, there may be instances where section 7 consultation would be triggered only if critical habitat is designated. Examples could include unoccupied habitat or occupied habitat that may become unoccupied in the future. One of our peer reviewers recommended designating critical habitat in major montane canyons and valley bottom cienegas, which today are largely overrun by nonnative predators and unoccupied by Chiricahua leopard frogs. This comment is addressed in issue 10 of the ''Summary of Comments and Recommendations'' herein. We concluded that designation of critical habitat in these areas is not currently prudent because a variety of aquatic and semiaquatic nonnative predators render them unsuitable as Chiricahua leopard frog habitat, we do not know how to remove those predators, and if Chiricahua leopard frogs could and did occupy these areas, just as with the currently occupied habitats, we would be concerned about increased human visitation and associated collection, vandalism, and disease transmission. We believe that any added benefit of critical habitat due to section 7 consultations in unoccupied habitat or recognition of areas important for recovery would be outweighed by the publication of detailed maps that would subject the species to the threat of collection, vandalism and disease transmission.

In balancing the benefits of critical habitat designation against the increased threats, we believe the records show that there are few benefits to be derived in this particular instance from designation of critical habitat. We believe that any potential benefits of critical habitat designation, beyond those afforded by listing, when weighed against the negative impacts of disclosing site-specific sites, does not yield an overall benefit. We, therefore, determine that critical habitat designation is not prudent for the Chiricahua leopard frog. If information comes to light in the future indicating critical habitat is prudent, we will reconsider designation. Critical habitat designation will also be reconsidered in the recovery planning process.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is designated or proposed. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) requires Federal agencies to confer with us on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is listed or critical habitat is designated subsequently, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with us.

The Chiricahua leopard frog occurs on Federal lands managed by the Coronado, Apache-Sitgreaves, Tonto, Coconino, and Gila National Forests; the Bureau of Land Management; and our refuges. Examples of Federal actions that may affect the Chiricahua leopard frog include, but are not limited to, dredge-and-fill activities, grazing programs, construction and maintenance of stock tanks, logging and other vegetation removal activities, management of recreation, road construction, fish stocking, issuance of rights-of-ways, and discretionary actions authorizing mining. These and other Federal actions require section 7 consultation if the action agency determines that the proposed action may affect listed species. Since the Chiricahua leopard frog was proposed, we have conferenced with several National Forests in Arizona and New Mexico on proposed operation of grazing leases, and in cooperation with the Forests, we have drafted criteria for guiding determinations of effect in regard to section 7 grazing consultations or conferences on the frog. These conferences are discussed in more detail in our response to Issue 8 in the ''Summary of Comments and Recommendations'' section of this rule.

Development on private or State lands requiring permits from Federal agencies, such as permits from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act, would also be subject to the section 7 consultation process. Federal actions not affecting the species, as well as actions that are not federally funded or permitted, would not require section 7 consultation. However, prohibitions under section 9 of the Act (discussed below) would apply.

Important regional efforts are currently underway to establish viable metapopulations of Chiricahua leopard frogs. We are currently working with Arizona Game and Fish Department, New Mexico Department of Game and Fish, the University of Arizona, and several Federal and private landowners in these efforts. An ongoing regional conservation planning effort in the San Bernardino Valley, Arizona, being undertaken by this agency, the Forest Service, State, and private individuals is a good example of such efforts. Owners of the Magoffin Ranch, in particular, have devoted extensive efforts to conserving leopard frogs and habitat at stock tanks on that ranch. As part of the San Bernardino Valley conservation

effort, a high school teacher and his students rear tadpoles in Douglas, Arizona, and established populations of Chiricahua leopard frogs in small constructed wetlands at Douglas area public schools (Biology 150 Class, Douglas High School 1998). In another regional conservation effort, the Tonto National Forest, Arizona, Arizona Game and Fish Department, and the Phoenix Zoo have developed a Chiricahua leopard frog ''conservation and management zone'' in which frogs have been reared and released into the wild to establish new populations (Sredl and Healy 1999). Another effort to remove nonnative predators and reestablish Chiricahua leopard frogs is underway at Buenos Aires National Wildlife Refuge, Arizona (Schwalbe and Rosen 2001). A similar regional conservation plan, involving The Nature Conservancy, Dr. Randy Jennings, and New Mexico Department of Game and Fish, is underway on the Mimbres River, New Mexico.

We commend the individuals involved in these efforts. These regional conservation plans are proving grounds for developing the techniques to recover the species rangewide. As such, we strongly support them, and encourage others to develop regional conservation plans. We will provide assistance and use our authorities to the fullest extent possible to help develop and implement site-specific conservation activities for this species. When the Chiricahua leopard frog is listed, handling, rearing, translocation or other forms of direct or incidental take resulting from conservation activities can continue under section 10 permits from us. Incidental take associated with conservation plans may also be permitted pursuant to an incidental take statement in a biological opinion for activities under Federal jurisdiction. Prior to the species listing, we will attempt work with the individuals involved in these conservation efforts to ensure that permits are issued promptly and that the process does not interrupt or hinder ongoing recovery actions.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all threatened wildlife. These prohibitions, including the regulations codified at 50 CFR part 17, make it illegal for any person subject to the jurisdiction of the United States to ''take'' a species, which is defined as killing a species or significantly harming it, including harassment or habitat destruction which causes death or significant injury to the species. These prohibitions also make it illegal to import or export, transport in interstate or foreign commerce in the course of a commercial activity, or sell or offer for sale in interstate or foreign commerce any threatened species unless provided for under a special rule. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions will apply to persons acting in an agency capacity on the behalf of the Service and to activities associated with cooperative State conservation agencies.

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

It is our policy (July 1, 1994; 59 FR 34272) to identify to the maximum extent practicable at the time a species is listed those activities that would or would not likely constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of the listing on proposed and ongoing activities within a species' range. Based on the best available information, the following are examples of actions that would not likely result in a violation of section 9:

(1) Actions that may affect Chiricahua leopard frog that are authorized, funded or carried out by a Federal agency when the action is conducted in accordance with an incidental take statement issued by us pursuant to section 7 of the Act, or for which such action will not result in take;

(2) Actions that may result in take of Chiricahua leopard frog when the action is conducted in accordance with a permit under section 10 of the Act;

(3) Recreational activities such as sightseeing, hiking, camping, and hunting in the vicinity of Chiricahua leopard frog populations that do not destroy or significantly degrade Chiricahua leopard frog habitat, and do not result in take of frogs;

(4) Release, diversion, or withdrawal of water from or near Chiricahua leopard frog habitat in a manner that does not displace or result in desiccation or death of eggs, tadpoles, or adults; does not disrupt breeding activities of frogs; does not favor introduction of nonnative predators; and does not alter vegetation characteristics at or near Chiricahua leopard frog sites to an extent that it exposes frogs to increased predation;

(5) Logging activities that do not result in erosion or siltation of stream beds and other aquatic habitats occupied by Chiricahua leopard frogs, do not adversely affect water quality, and do not denude shoreline vegetation or terrestrial vegetation in occupied habitat; and

(6) In accordance with the special rule, activities associated with the use and maintenance of livestock tanks, such as, but not limited to: trampling by livestock, cleaning sediment from the tanks, and clearing or grazing of vegetation around the tanks.

Activities that we believe could potentially result in ''take'' of the Chiricahua leopard frog, include, but are not limited to the following:

(1) Unauthorized collection, capture, or handling of the species;

(2) Intentional introduction of nonnative predators, such as nonnative fish, bullfrogs, crayfish, or tiger salamanders into occupied frog habitat;

(3) Any activity not carried out pursuant to the special rule described in ''§ 17.43 Special rules-vertebrates'' that results in destruction or significant alteration of habitat of Chiricahua leopard frog including, but not limited to, the discharge of fill material into aquatic habitat occupied by the species, the diversion or alteration of stream flows and aquatic habitats occupied by the species or withdrawal of water to the point at which habitat becomes unsuitable for the species, grazing in occupied habitat or overgrazing in the watersheds of occupied habitat, and the alteration of the physical channels within the stream segments and aquatic habitats occupied by the species;

(4) Water diversions, groundwater pumping, water releases or other water management activities that result in displacement or death of eggs, tadpoles, or adult frogs; disruption of breeding activities; introduction of nonnative predators; or significant alteration of vegetation characteristics at or near occupied sites. However, pursuant to the special rule for this species, operation and maintenance of livestock tanks on private, State, or Tribal lands that result in incidental mortality of frogs would not be considered a violation of section 9;

(5) Discharge or dumping of hazardous materials, silt, or other pollutants into waters supporting the species;

(6) Possession, sale, delivery, transport, or shipment of illegally taken Chiricahua leopard frogs; and

(7) Actions that take Chiricahua leopard frogs that are not authorized by either a permit under section 10 of the Act or an incidental take statement under section 7 of the Act, or are not exempted from the section 9 take prohibitions as described in the special rule ''§ 17.43 Special rules-amphibians'' for this species; the term ''take'' includes harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capture, or collecting, or attempting any of these actions.

Not all of the activities mentioned above will result in violation of section 9 of the Act; only those activities which result in ''take'' of Chiricahua leopard frog would be considered violations of section 9. We will review other activities not identified above on a case-by-case basis to determine whether they may be likely to result in a violation of section 9 of the Act. We do not consider these lists to be exhaustive and provide them as information to the public. Please direct your questions regarding whether specific activities will constitute a violation of section 9 to the Field Supervisor, Arizona Ecological Services Field Office (see **ADDRESSES** section).

We may issue permits to carry out otherwise prohibited activities involving threatened wildlife species under certain circumstances. Regulations governing permits for threatened species are at 50 CFR 17.32. Address your requests for copies of the regulations on listed wildlife and inquiries about prohibitions and permits to the U.S. Fish and Wildlife Service, Branch of Endangered Species/Permits, P.O. Box 1306, Albuquerque, NM 87103 (telephone (505)248–6920, facsimile (505)248–6922).

Required Determinations

(1) Civil Justice Reform. A decision on whether the Chiricahua leopard frog should be listed is required by the Endangered Species Act and the need for this threatened designation is well documented herein. Special rules may be issued by the Secretary of the Interior pursuant to section 4(d) of the Act when such regulation is deemed ''necessary and advisable to provide for the conservation of the species.'' The special rule will promote the conservation of the Chiricahua leopard frog by allowing ranchers to continue to maintain their stock tanks, which provide habitat for the frog, as they have in the past without additional regulatory burdens being imposed as a result of the listing of the frog as threatened. The rule clearly states that existing and future stock tanks on non-Federal land can be used and maintained without fear of violating section 9 of the Act. Since the special rule will benefit the Chiricahua leopard frog without imposing a burden on the public; we do not expect it to be challenged. As a result, in accordance with Executive Order 12988, the Office of the Solicitor has determined that the listing and special rule do not unduly burden the judicial system and meet the requirements of sections 3(a) and 3(b)(2) of the Order.

(2) National Environmental Policy Act. We have determined that Environmental Assessments and Environmental Impact Statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act, as amended. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). In addition, we have determined that Environmental Assessments and Environmental Impact Statements, as defined under the authority of the National Environmental Policy Act, need not be prepared in connection with regulations adopted pursuant to section 4(d) when they accompany listings, as in this case.

(3) Government-to-Government Relationship with Tribes. In accordance with the President's memorandum of April 29, 1994, ''Government-to-Government Relations with Native American Tribal Governments'' (59 FR 22951) Executive Order 13175 and 512 DM 2, we have evaluated possible effects on Federally recognized Indian tribes and have determined that there are no effects.

(4) Paperwork Reduction Act. This rule does not contain any new collections of information other than those already approved under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*, and assigned Office of Management and Budget Control Number 1018–0094, which expires on July 31, 2004. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid Control Number. For additional information concerning permit and associated requirements for endangered species, see 50 CFR 17.22.

References Cited

You may request a list of all references cited in this document, as well as others, from the Arizona Ecological Services Field Office (see **ADDRESSES** section).

Author

The primary author of this notice is James Rorabaugh (see **ADDRESSES** section).

List of Subjects in 50 CFR Part 17

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

Regulation Promulgation

We amend Part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as follows:

PART 17—[AMENDED]

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

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

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

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*		*
AMPHIBIANS							
*	*	*	*	*	*		*
Frog, Chiricahua leopard.	*Rana chiricahuensis*	U.S.A. (AZ, NM), Mexico.	Entire	T	726	NA	§ 17.43(b)
*	*	*	*	*	*		*

3. Amend § 17.43 by adding paragraph (b) to read as follows:

§ 17.43 Special rules—amphibians.

* * * * *

(b) Chiricahua leopard frog (*Rana chiricahuensis*).

(1) *What activities are prohibited?* Except as noted in paragraph (b)(2) of this section, all prohibitions of § 17.31 will apply to the Chiricahua leopard frog.

(2) *What activities are allowed on private, State, or Tribal land?* Incidental take of the Chiricahua leopard frog will not be considered a violation of section 9 of the Act, if the take results from livestock use at or maintenance activities of livestock tanks located on private, State, or Tribal lands. A livestock tank is defined as an existing or future impoundment in an ephemeral drainage or upland site constructed primarily as a watering site for livestock.

Dated: June 6, 2002.

Paul Hoffman,

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 02–14730 Filed 6–12–02; 8:45 am]

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