

Arroyo Toad

Arroyo Toad (*Bufo californicus*)

Management Status

Heritage Status Rank: G2G3 T2T3 S2S3

Federal: Endangered (59 Federal Register 64859); Critical Habitat proposed April 28, 2004 (69 Federal Register 23254); proposed rule modified on February 14, 2005 (70 Federal Register 7459). Final Critical habitat was designated on April 13, 2005 (50 Code of Federal Regulations Part 17). The arroyo toad recovery plan was issued in 1999.

State: California Department of Fish and Game Species of Special Concern

Other: None

General Distribution

The arroyo toad historically occurred from the upper Salinas River system in Monterey County to the vicinity of San Quintin, Baja California; it was found in at least 22 river basins in southern California. The species has been extirpated from approximately 75 percent of its former range in the United States (U.S. Fish and Wildlife Service 1999).

The current distribution of arroyo toad in the United States is from the San Antonio River in Monterey County south to the Tijuana River and Cottonwood Creek Basin along the Mexican border. Although the arroyo toad occurs mostly along coastal drainages, it has also been recorded at several locations on the desert slopes of the Transverse Ranges (Jennings and Hayes 1994).

Distribution in the Planning Area

The arroyo toad is concentrated in a small number of locations on the Los Padres National Forest. Substantial populations exist on Piru Creek, including the lower reaches of Agua Blanca Creek; Sespe Creek; and interconnected reaches of the upper Santa Ynez River, Mono Creek, and Indian Creek. A smaller population occurs along the Sisquoc River. All these populations are predominantly on National Forest System lands. The northernmost population of arroyo toads, on the San Antonio River in Monterey County, lies just off the national forest on the Fort Hunter Liggett Military Reservation

(Stephenson and Calcarone 1999).

On the Angeles National Forest, arroyo toad populations occur along Castaic Creek; along Big Tujunga Creek, including associated lower reaches of Mill and Alder Creeks; along Arroyo Seco Creek; and on the desert side of the San Gabriel Mountains along Little Rock Creek. These populations lie near the national forest boundary and, in some cases, extend beyond it (Stephenson and Calcarone 1999).

On the San Bernardino National Forest, arroyo toad populations exist on tributaries of the Mojave River including lower Deep Creek, the West Fork of the Mojave River, and Little Horsethief Creek. Populations also occur on lower portions of the Whitewater River, Cucamonga Creek, and Cajon Wash (Hyde-Sato pers. comm.). The species probably still occurs on lower reaches of the San Jacinto River; a population was recently discovered in the adjacent Bautista Creek (Stephenson and Calcarone 1999). A new population was just discovered on Kinley Creek in 2003.

Arroyo toad populations on the Cleveland National Forest and surrounding lands are more numerous than on the other forests, but many appear to be small. Most of the populations occur right along the national forest boundary, with the bulk of prime breeding habitat often lying just off National Forest System lands. This is the case at Cottonwood Creek, which includes lower reaches of Kitchen and Morena Creeks, Potrero Creek, the Sweetwater River, the upper San Diego River, Santa Ysabel Creek and associated lower reaches of Temescal Creek (Pamo Valley), the upper forks of the San Luis Rey River (above Lake Henshaw) including Agua Caliente Creek, Temecula Creek including lower reaches of Arroyo Seco Creek, San Mateo Creek, San Juan Creek, and Trabuco Creek, Cristianitos Creek, Gabino Creek, and Talega Creek. The population along Pine Valley Creek and several of its tributaries is predominantly on National Forest System lands (Stephenson and Calcarone 1999).

Systematics

The arroyo toad is one of three members of the southwestern toad complex (*Bufo microscaphus*) in the family *Bufo*idae. At the time it was listed, the arroyo toad was considered a subspecies of southwestern toad (*B. m. californicus*). Based on recent genetic studies arroyo toad is now considered a separate species (*B. californicus*) (Gergus 1998 as referenced in U.S. Fish and Wildlife Service 2001).

Natural History

Habitat Requirements

The arroyo toad is endemic to the coastal plains, mountains, and desert slopes of central and southern California and northwestern Baja California from near sea level to about 8,000 feet (2,400 meters). Within these areas, arroyo toads are found in both perennial and intermittent rivers and streams with shallow, sandy to gravelly pools adjacent to sand or fine gravel terraces. Arroyo toads have evolved in a system that is inherently dynamic, with marked seasonal and annual fluctuations in rainfall and flooding. Breeding habitat requirements are highly specialized. Specifically, arroyo toads require

shallow slow-moving stream and riparian habitats that are naturally disturbed on a regular basis, primarily by flooding (U.S. Fish and Wildlife Service 2000).

Proposed Critical Habitat for the arroyo toad encompasses 95,665 acres (38,731 hectares) in 23 separate units in Monterey, Santa Barbara, Ventura, Los Angeles, Orange, San Bernardino, Riverside, and San Diego counties (69 Federal Register 23254). About 23.6 percent of proposed Critical Habitat is located on National Forest System lands in southern California. The proposed rule for designating Critical Habitat includes a description of the physical and biological features (Primary Constituent Elements [PCEs]) that are essential to the conservation of the species and these PCEs are summarized in the proposed rule (69 Federal Register 23254).

Reproduction

The breeding period occurs from late January or February to early July, although it can be extended in some years depending on weather conditions. Breeding in mountainous habitats may commence later (May–June) and last longer (to August) than in the coastal portion of the range. When water temperatures reach 57 ° F (14 ° C), adult males advertise with a soft, high whistled trill. Receptive females seek out calling males based on the size of the male and the sound of his call.

Although males may breed with several females in a season, females release their entire clutch of eggs in a single breeding effort and probably do not produce a second clutch during the season. Eggs are deposited and larvae develop in shallow pools with minimal current, little or no emergent vegetation, and sand or pea gravel substrate. Embryos usually hatch in 4–6 days; the larval period lasts approximately 65–85 days.

After metamorphosis from June to August, the juveniles remain on the bordering gravel bars until the pool no longer persists. Sexual maturity is reached in 1-2 years. Little is known about movements or other behavior in the non-breeding season (U.S. Fish and Wildlife Service 2000).

Survival

Data on longevity are largely unavailable, although age-size distributions indicate that many individuals live only about 5 years (Sweet 1992, 1993).

Dispersal

Dispersal activity is usually associated with rainfall and moderate temperatures above 45 ° F (7 ° C). Dispersal has been observed to be dependent on sex and age. Females tend to stay within a given area, whereas juveniles tend to move generally upstream. Young males tend to move in response to the presence of a dominant male in each breeding pool, while females may remain to breed with these dominant individuals (U.S. Fish and Wildlife Service 2000).

Subadult and adult arroyo toads may range widely into the surrounding uplands: commonly up to 0.3 mile (0.5 kilometer), and a few individuals along the coastal plain have dispersed as much as 1.2 miles (2.0 kilometers) from the stream. Dispersal distances on typical national forest locations are estimated to be only a few hundred meters based on the steeper topography. Ramirez (2002) had only two occurrences where toads exceeded a lateral movement of over 0.1 mile (0.2 kilometer) with most individuals using habitat within 50 meters of the active channel.

The distance from breeding sites at which arroyo toads are found depends on the topography and the extent of suitable habitat. Natal dispersal movements may be over 2 miles (3 kilometers). The uplands are often coastal sage scrub, chaparral, grassland, or oak woodland. Substantial areas of fine sand, into which adult toads burrow, must be present, but can be interspersed with gravel or cobble deposits (U.S. Fish and Wildlife Service 2000).

Daily/Seasonal Activity

Juvenile arroyo toads spend more time exposed on terraces during the daytime than do adults, and are thus vulnerable to diurnal predators. Once juveniles are of sufficient size to dig burrows and bury themselves in sand, they become nocturnal. All age classes of post-metamorphic individuals tend to be active on rainy nights with moderate temperatures (above 45 ° F [7 ° C]). Adults excavate shallow burrows for shelter during the day when the surface is damp or for longer intervals in the dry season (U. S. Fish and Wildlife Service 2000).

Diet and Foraging

Larvae feed by inserting their heads into the substrate and ingesting loose organic material such as detritus, interstitial algae, bacteria, and diatoms. Juveniles and adults forage for insects, especially ants and small beetles, on sandy stream terraces (U.S. Fish and Wildlife Service 2000) or around the drip line of oak trees (66 Federal Register 9414, U.S. Fish and Wildlife Service 2001).

Predator-Prey Relations

All life stages of arroyo toad are susceptible to predation. Egg strands, which are laid in shallow water close to shore, are extremely sensitive to disturbance and fragmentation from animals foraging or wading in the water. There are several predators of arroyo toad larvae; these include giant water bug (*Abedus indentatus*), two-striped and common garter snakes (*Thamnophis hammondi* and *T. sirtalis*), green sunfish, and bullfrog (*Rana catesbeiana*). Predators of juveniles and adults include wading and shorebirds, snakes, western pond turtle (*Clemmys marmorata*), raccoon (*Procyon lotor*), opossums (*Didelphis virginiana*), and common raven (*Corvus corax*) (U.S. Fish and Wildlife Service 2000).

Inter- and Intraspecific Interactions

In habitats with small breeding populations of arroyo toad, increased densities of California toads (*Bufo*

boreas halophilus) can interfere with calling activities of male arroyo toads (Sweet 1992, U.S. Fish and Wildlife Service 2000).

Population and/or Habitat Status and Trends

The Riparian Obligate Biological Opinion (U. S. Fish and Wildlife Service 2000) provided a detailed description of the environmental baseline for the arroyo toad as it was understood at that time. New information regarding population and habitat status and trends for the arroyo toad has become available since 2000. This new information is presented on a forest-by-national forest basis.

Angeles National Forest

On the Angeles National Forest, arroyo toad populations occur along Castaic Creek; along Big Tujunga Creek, including associated lower reaches of Mill and Alder Creeks; and on the desert side of the San Gabriel Mountains along Little Rock Creek. At this time, no estimates exist for the Angeles National Forest populations. Telemetry studies have been conducted on the population along Little Rock Creek. Yearly surveys are conducted at each of these three locations to attempt to detect any noticeable changes in toad activity. No 'new' populations of arroyo toads have been discovered on the Angeles National Forest.

Cleveland National Forest

Arroyo toads occur in most of the major stream systems on the Cleveland National Forest. Since 2000, the National Forest conducted a PIT-tag study of the arroyo toad population in upper Pine Valley Creek, and a 3-year radio-telemetry study of the population at San Juan Creek. These studies showed that the toads tend to remain in close proximity to the stream, usually within 100 meters or less of the active stream channel. No "new" populations of arroyo toads have been detected. Approximately 25 miles of modeled habitat has been surveyed with no arroyo toad populations located.

Los Padres National Forest

A draft paper (Uyehara 2005) on the status of the arroyo toad on the Los Padres National Forest was used to develop the following information on the status of the arroyo toad on the Los Padres National Forest. Uyehara (2005) reports that arroyo toad populations in Upper Santa Ynez River and Upper Piru Creek are comparable in size to those populations inventoried in the early 1990s and the same appears true for portions of Sespe Creek (Lion Campground downstream to Oak Flats) where comparable data exists. Comparable data sets are not available for arroyo toad populations on the portion of Sespe Creek from Beaver Campground to Lion Campground so it is not possible to estimate changes in population status for this reach of Sespe Creek. Available data suggests that arroyo toad populations could be declining in lower Piru and the small population found on the Sisquoc River appears to have declined as well. Arroyo toads were breeding at the confluence of Fox Creek and Santa Ynez in the mid-1990s, but in 2000-2002, the suitable habitat was much reduced due to low rainfall when compared to the wetter

years of 1998-1999. Changes in arroyo toad populations cannot be attributed to changed management procedures using available data sets. Variability in annual weather patterns, survey timing, conditions, and intensity, and surveyor bias make it difficult to draw statistically meaningful conclusions regarding variation in arroyo toad populations. There remains the possibility that change in management practices related to road and campground use and maintenance may have reduced the magnitude of population declines that were observed during drought years but this hypothesis cannot be proven at this time.

No 'new' populations of arroyo toads have been discovered on the Los Padres National Forest. Arroyo toads have established breeding pools at Castaic Mine in Upper Piru Creek, about 3.2 km upstream of from Bear Gulch, which had been previously reported as the upstream limit of distribution for arroyo toads (USDA National Forest Service 2000). Surveys conducted in the upper Cuyama watershed and in Upper Piru upstream of Castaic Mine have not resulted in the detection of any new populations of arroyo toads.

San Bernardino National Forest

Recent droughts, fires, and floods have probably adversely affected arroyo toad on the San Bernardino National Forest. Some known occupied habitat has gone for several years with no surface water for breeding during the breeding season. In addition to the fires and floods, the areas that were impacted have had considerable emergency repair work done to roads, railroads, and utilities. Drainages that have been impacted the most are Cajon Wash and Bautista Canyon. Beaver dams in lower Deep Creek behind Mojave Fks. Dam were recently blown out from the flooding. This should improve the habitat for toads by restoring sandy benches and islands, as well as reducing the bullfrog population which thrives in beaver dam ponds.

Bautista Canyon Road improvement project has been abandoned by Riverside County. This road improvement was predicted to be a problem for toads.

Unauthorized off-highway vehicle (OHV) use if not adequately controlled is a problem for toads in lower Deep Creek, Horsethief Creek, and Cajon Wash. Dispersed recreation (especially illegal camping) is a problem in Deep Creek at the Hot Springs. Illegal campfires and dispersed recreation are a problem in Bautista Canyon. The near record precipitation in the winter of 2005 should help recharge the streams that have had severely low flows. This should benefit toads.

"This species has disappeared from 76 percent of its total historic range in the United States (California). Populations have disappeared entirely from the northern, central, and eastern parts of its range; the extreme habitat specialization of arroyo toads coupled with the fact that most factors that undoubtedly contributed to the extirpation of most populations are still impacting or threaten the few (less than 25) remaining small (30-100 adults) populations" (Sweet 1991,1993). "Coupled with requirements of relatively large, streamside flats with scattered vegetation (juvenile-adult habitat) adjacent to shallow pools with open sand or gravel bars place significant constraints where arroyo toads may occur. Development and alteration of streamside flats (particularly by changing the natural

hydrologic regime) may have been the crucial factors contributing to the extirpation of historic populations".

Threats and Conservation Considerations

The four southern California National Forests may support approximately 36 percent of the total range-wide population. Of the 22 drainages that support arroyo toads in California, portions of 12 of these are located on National Forest System lands.

In an effort to stabilize and maintain existing populations, each of the southern California Forests are currently implementing efforts to modify and change management activities to minimize potential effects. Each National Forest is also conducting studies to learn additional life history and basic ecology of the species. The Angeles and Los Padres National Forests have been conducting telemetry studies for a number of years to monitor existing populations. The Cleveland National Forest is also conducting life history research and mark and recapture studies. All four Forests have conducted and are currently conducting protocol-level surveys to identify new populations and to monitor existing populations (U.S. Fish and Wildlife Service 2000).

Arroyo toad populations are localized and face a variety of threats. Many populations occur immediately below major dams. The manner in which water is released from upstream reservoirs can greatly influence arroyo toad reproductive success. Recent coordination between various government agencies resulted in releases from Pyramid Dam that more closely mimic natural flows in lower Piru Creek (Sweet 1992). The modified releases have benefited arroyo toads in that drainage (Stephenson and Calcarone 1999).

Drawdown of surface water from wells is also a concern (Stephenson and Calcarone 1999). National forest personnel participate in multi-jurisdictional planning processes to coordinate stream flows and ground water extraction.

Predatory nonnative species are a significant threat to arroyo toads. Bullfrogs have been observed to eat juvenile and adult arroyo toads (Sweet 1993). A number of warm water fishes (e.g., green sunfish, bluegill, largemouth bass, and black bullheads) and crayfish have been shown to feed on arroyo toad larvae and can cause high larval mortality in breeding pools (Sweet 1992). These species occur in many of the streams occupied by arroyo toads. In areas near human development, Argentine ants have spread into riparian areas and are reducing the native ant fauna. Native ants are a major food source for arroyo toads; consequently, the species may be negatively affected by the continued spread of Argentine ants (Stephenson and Calcarone 1999).

Invasive nonnative plants are also a problem in some areas. Tamarisk and arundo colonize newly created flood terraces and can form dense masses of vegetation. These dense stands have higher rates of evapotranspiration than does native vegetation, thereby decreasing the amount of available surface water. Tamarisk and arundo also stabilize stream terraces, deepening flood channels and resulting in

unsuitable habitat for arroyo toads (Stephenson and Calcarone 1999). The Forests are involved in projects removing invasive nonnative plant and animal species where opportunities occur (Anderson pers. comm.).

Campgrounds and roads near arroyo toad breeding pools have resulted in toads and their egg masses being inadvertently crushed by vehicle and foot traffic and disturbed by waterplay. There are a number of national forest campgrounds located near arroyo toad breeding habitat—seven on the Los Padres National Forest, four on the Angeles National Forest, and four on the Cleveland National Forest. Seasonal closures and/or restrictions on vehicle access have recently been instituted at some of these campgrounds to reduce impacts (e.g., Beaver, Lion, and Mono Campgrounds on the Los Padres and Joshua Tree Campground on the Angeles). Road crossings in toad habitat are also being evaluated, and several on the Los Padres and Cleveland have been relocated or rebuilt to reduce impacts to breeding pools (Stephenson and Calcarone 1999).

OHV activity in arroyo toad habitat is a problem in some areas, particularly on desert-side streams (e.g., Little Rock Creek, Mojave River, upper Piru Creek). On National Forest System lands, most of the OHV-related habitat damage is the result of unauthorized travel off designated routes into areas legally closed to such use. It is the actions of these few irresponsible individuals that represent a challenging law enforcement problem (Stephenson and Calcarone 1999).

Livestock grazing in arroyo toad habitat can cause trampling of toads and their egg masses. It also can result in degradation of sand bars and terrace habitats that are important to arroyo toad. Over the last 10 years, some riparian habitat on the southern California National Forests has been formally excluded from grazing. However, many areas are intermingled with private lands where riparian grazing still occurs. Maintenance of fencelines to prevent cattle movement onto public portions of the riparian corridor is a management problem in some areas occupied by arroyo toads (Stephenson and Calcarone 1999).

Suction-dredge mining and streamside prospecting have the potential to cause impacts in several areas. Suction dredging and streamside prospecting have occurred on Piru Creek on the Los Padres National Forest, Cajon Wash and Little Horsethief Creek on the San Bernardino National Forest (Loe pers. comm.), and Pine Valley Creek on the Cleveland National Forest. Prospecting activities, including the digging of pits in the streambed and banks, has occurred on Little Horsethief Creek on the San Bernardino National Forest.

Siltation by any means, whether it be from intense grazing, mining, OHV's, or the aftermath of fires, can eliminate amphibian populations that breed in streams. The arroyo toad is a species-at-risk from this occurrence (Scott pers. comm.).

The following is a list of conservation practices that should be considered for the arroyo toad:

- When planning management actions within or near stream courses, lakes, reservoirs, meadows or

vernal pools; riparian area protection through the designation of Riparian Conservation Areas (RCAs) will be based on methods described in the Five-Step Project Screening Process for Riparian Areas. Develop a National Forest Service Handbook to describe tactics for management within RCAs,

- Utilize Adaptive Mitigation Protocol for Recreation Uses to identify management activities (recreational or others) that cause riparian and/or habitat degradation in occupied streams and pursue options to avoid or minimize the effects of those activities (management actions could include signing, interpretation, increased National Forest Service presence in the area, or the more extreme protection of an area closure, as necessary),
- Work closely with California Department of Fish and Game to reduce or eliminate any new introductions of invasive nonnative fish species into priority stream reaches,
- Work closely with California Department of Fish and Game to restrict suction dredging in high priority stream reaches,
- Work closely with threatened, endangered, and proposed species Recovery Teams to provide data and specifics about resources on National Forest System lands,
- Work closely with species expert groups and universities to stay current on emerging scientific information regarding this species,
- Ensure adequate instream flows are secured and maintained during hydropower project relicensing and/or authorization or reauthorization of channel/flow altering special use permits,
- Identify and prioritize restoration opportunities and seek funding to complete the restoration within the planning cycle,
- Conduct prescribed burn projects in the contributing watersheds to minimize the occurrence of stand replacing wildland fires that could cause habitat degradation,
- Develop interpretive products to explain the population declines of many native aquatic species in California and on National Forest System lands,
- Develop interpretive products describing the effects of trash and toxic substances on water quality and the aquatic environments,
- Develop interpretive products to explain issues and solicit help in reducing the spread of noxious weeds and other nonnative species such as bullfrogs and Argentine ants,
- Survey threatened, endangered, and proposed modeled habitat to continue to refine suitable and unsuitable habitat,
- Work cooperatively with other agencies (California Department Fish and Game, U.S. Geological Survey, U.S. Fish and Wildlife Service, NOAA Fisheries, etc.) to conduct species and habitat surveys. Share information to continuously improve knowledge about known locations. Work cooperatively with National Forest Service Research Stations and universities to identify and initiate research projects on National Forest System lands,
- Implement the measures in Province Forest Plan Consultation Package and Biological Opinion.

Evaluation of Current Situation and Threats on National Forest System Lands

The species is listed as endangered because of the population numbers and risks throughout its range. Many of the populations on the national forests are near the national forest boundary, widely scattered and have locations, which support only small numbers of individuals. Much of the habitat off the

national forest has been severely degraded by development and flood control. Some populations are dependent upon timely releases from dams and the National Forest Service does not control these releases. Nonnative plants and animals are increasing and pose a serious threat in some locations. Recreational use is increasing and this use can have adverse effects on the toads. Mining and prospecting is still occurring in some areas and this can be detrimental. The major drought in the San Bernardino and San Jacinto Mountains may have had a substantial negative affect on this species.

In an effort to protect toads on the Angeles National Forest, several closures were implemented beginning in 1997 (100-acres seasonal closure at Little Rock), with additional closures in 1998 (Alder Creek and associated access road), and in 1999 (Little Rock closure was expanded to 3000 acres and included Santiago Canyon). These closures remain in effect. In 1996, the Marple Fire burned through the Castaic Creek area and since that time all grazing in that area has been suspended.

On the Cleveland National Forest, Dripping Springs, Boulder Oaks, and Upper San Juan Campgrounds have been closed seasonally (March 1- May 31) to protect toad habitat during the breeding season. No differences in the conditions of these populations have been detected since the closures were implemented. Lower San Juan Picnic Area has been permanently closed, and all remaining improvements and pavement will be removed within the next 1-2 years. In 2004, 2 miles of unauthorized roads that were affecting arroyo toad habitat in Noble Creek were permanently closed.

On the Los Padres National Forest, in contrast to management activities that occurred prior to 2000, campground use and road travel has decreased in occupied arroyo toad habitat. Campgrounds in occupied habitat have either been decommissioned (Lion, Beaver, plus 2 other campgrounds) or made subject to seasonal closures (Hardluck Campground) with a corresponding decrease in road use. Looking at land-use patterns, arroyo toads appear to preferentially breed in areas near developed campgrounds for reasons that appear to be related to stream gradient and substrate. Campgrounds have been coincidentally located in these same areas perhaps because such locations are attractive to recreation planners and the recreating public they intended to serve. Analysis of available data does not allow for a causative relationship to be inferred -- it just confirms that the breeding by arroyo toads is more likely to occur in streams next to campgrounds. One analysis of land-use impacts showed that bank trample was larger in occupied threatened and endangered amphibian habitat, although trampling occurred in localized sites and was low overall. It is possible that trampling resulting from dispersed recreation use may occur sufficiently late in the year to avoid substantial overlap with the breeding season of arroyo toads.

On the San Bernardino National Forest, OHV trail crossings of Deep Creek and Bautista Creek are rocked annually to stabilize the crossing and preclude breeding and egg laying in the crossings.

Increased resource patrols have been implemented in the past 3-4 years to make sure that riparian habitats are being protected and new roads and trails are not being created that would affect threatened and endangered species, including arroyo toad.

Based on the above analysis, this species has been assigned the following threat category:

6. Widespread in Plan area with substantial threats to persistence or distribution from National Forest Service activities.

Viability Outcome for National Forest System Lands

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| 1 | 2 | 3 | 4 | 4a | 5 | 6 |
| D | C | C | D | C | E | C |

The arroyo toad is found in both perennial and intermittent rivers and streams with shallow, sandy to gravelly pools adjacent to sand or fine gravel terraces (U.S. Fish and Wildlife Service 2000). The primary threats to this species are changes to the hydrologic regime in drainages where they occur, loss and/or degradation of aquatic and upland habitat, predatory exotic species, and blockages to individual dispersal. Perennial streams, with year-round flows, would continue to receive heavy pressure from recreational use in all alternatives, as these are very desirable locations for day-use activities.

Alternatives 2-6 would provide stream and riparian area protection through forest plan standards and the use of the Five-Step Project Screening Process for Riparian Areas that delineates Riparian Conservation Areas for special management. Application of this process should minimize affects to aquatic species from Forest Service activities.

Under Alternative 1, current management (which includes application of the Interim Management Guidelines for Riparian Systems) will continue to avoid aquatic environments and mitigate potential effects from proposed projects. Riparian protection would be provided through the riparian conservation strategy. Critical Biological zoning specifically for the arroyo toad would occur in segments Castaic Creek and Little Rock Creek on the Angeles National Forest. There would continue to be slow and steady progress towards protecting and conserving this species.

Under Alternative 2, streams and riparian area management would be similar to that found in Alternative 1, but aquatic environments with at-risk species would receive added emphasis through the use of an adaptive management approach to meet riparian desired conditions. Critical Biological zoning specifically for the arroyo toad would occur in segments of Castaic, Little Rock, Soledad, and parts of Upper Big Tujunga Creeks on the Angeles National Forest; Little Horsethief Canyon and Lower Deep Creeks on the San Bernardino National Forest; and the San Diego River on the Cleveland National Forest. There will also be steady progress towards protecting and conserving this species, at a little faster pace than in Alternative 1, through the implementation of this alternative.

Alternative 3 is similar to Alternatives 1 and 2; with the key difference being that there will be an

increased focus on improving habitat for at-risk species. Habitat restoration primarily relating to stream channel conditions, associated upland habitat, flow management and riparian vegetation health would receive focused attention. Critical Biological zoning specifically for the arroyo toad will occur in segments of Castaic, Little Rock, Soledad, and parts of Upper Big Tujunga Creeks on the Angeles National Forest; Little Horsethief Canyon and two segments of Lower Deep Creek, and Bautista Creek on the San Bernardino National Forest; San Diego River and Dripping Springs on the Cleveland National Forest; and Upper and Middle Santa Ynez River (including Mono Creek), Upper Sespe and Upper Piru Creeks on the Los Padres National Forest. In addition, there is an emphasis on conservation and recovery of riparian dependent species, which would result in an improved outcome for this species. Alternatives 3, (Note, 4 is reactive after problems identified) and 6 are likely to mitigate effects from existing uses at a faster pace than other alternatives, due to an emphasis on biodiversity. Alternatives 3 and 6 would relocate conflicting uses from riparian areas (e.g. possibly restricting use of segments of a stream during critical breeding periods) and make land acquisition for biodiversity the high priority (e.g. acquiring lands with streams adjacent to National Forest System lands to restore overall stream channel connectivity). Alternatives 3 and 6 will prioritize habitat enhancement projects through prescribed burning for certain species-at-risk. However, total acreage burned for biodiversity would not be great due to the emphasis on community protection. Alternatives 3, 4a, and 6 have much more public non-motorized land use zoning which should be beneficial to the toad.

Although Alternative 4 is similar to Alternative 2 in the use of an adaptive management approach for species habitat protection, there is a greater emphasis on accommodating recreation demand and maintaining sustainable recreation opportunities. The focus will be on maintaining and improving existing recreational areas and facilities, with a priority given to those areas where detrimental effects are occurring or could occur to species-at-risk or their habitat. For this species, this would relate to the aquatic, riparian, and associated upland environments. Critical Biological zoning specifically for the arroyo toad would occur in one segment of Castaic Creek and in Little Rock on the Angeles National Forest; Little Horsethief Canyon and two segments of Lower Deep Creek on the San Bernardino National Forest. Habitat restoration activities in Alternative 4 would be primarily accomplished at the prioritized recreational use areas in association with environmental education and interpretation, hardening of the recreation sites, increased National Forest Service presence, and restriction of unauthorized uses. National forest visitors would have an increased understanding and appreciation of the local environment and an increased willingness to help maintain it. New recreation opportunities may be developed where they are determined to be sustainable and compatible with other resources. This alternative would assist in the protection, conservation and recovery of this species while attempting to accommodate recreation demand. Mitigation of recreation impacts would be more reactive than in Alternatives 2, 3, 4a, and 6 and occur after problems are identified. For Alternatives 2, 3, 4, and 4a adverse effects from on-going activities in established sites would be equally mitigated.

Although Alternative 4a is similar to Alternative 4 in the use of an adaptive management approach for species habitat protection, there is a greater emphasis on only providing recreational uses that are compatible with the sustainability of the natural resources. Compared to the other alternatives, there is a higher level of focus on maintaining, improving, and expanding existing recreational areas and facilities before new facilities are constructed. This alternative would have more dispersed recreation area

management. Critical Biological zoning specifically for the arroyo toad would occur in segments of Castaic, Little Rock, Soledad and most segments of Upper Big Tujunga Creeks on the Angeles National Forest; Little Horsethief Canyon and two segments of Lower Deep Creek, and Bautista Creek on the San Bernardino National Forest; San Diego River and Dripping Springs on the Cleveland National Forest; and Upper and Middle Santa Ynez River (including Mono Creek), Upper Sespe and Upper Piru Creeks on the Los Padres National Forest. Priority is given to those areas where detrimental effects are occurring or could occur to species-at-risk or their habitat. For this species, this would relate to the aquatic and riparian environments. Habitat and imperiled population restoration activity efforts would be made in Alternative 4a by using a variety of strategies. There will be an emphasis on land acquisition for biodiversity and maintaining and enhancing landscape linkages for wildlife movement. National forest visitors would have an increased understanding and appreciation of the local environment and an increased willingness to help maintain it. There would be a focus on national forest health and the management for sustainable resource use in all land use zones. New recreation opportunities may be developed where they are determined to be sustainable and compatible with other resources. The greatest difference in Alternative 4 and 4a that is important to the arroyo toad is the emphasis in Alternative 4a on public non-motorized land use zoning. A high level of public use that is facilitated by vehicle access is a substantial problem for this species because of human disturbance.

Alternative 5 has an emphasis of increased motor vehicle-based recreation activities, commodity development, and accommodating community infrastructure such as water diversion and uses. This results in a more reactive approach to protecting species-at-risk, the possibility of higher risks to the species and habitat because of the effects of more overall development, motorized uses and extraction activities occurring concurrently, and a decreased emphasis on habitat improvement. Conservation objectives would be met at a much slower rate in Alternative 5 compared to any other alternative. Alternative 5 would have a greater adverse effect on riparian areas in part because of the emphasis of providing for increased demand for motorized recreation and the amount of land allocated to motorized uses.

Alternative 6 is generally similar to Alternative 3 for aquatic and riparian dependent species, although moving towards the desired conditions for water and riparian areas and achieving protection and recovery of at-risk species would occur at a faster rate than under any other alternative. Critical Biological zoning specifically for the arroyo toad will occur in segments of Castaic, Little Rock, Soledad, and parts of Upper Big Tujunga Creeks on the Angeles National Forest; Little Horsethief Canyon and two segments of Lower Deep Creek, and two sections of Bautista Creek on the San Bernardino National Forest; San Diego River and Dripping Springs on the Cleveland National Forest; and Upper and Middle Santa Ynez River (including Mono Creek), Upper Sespe and Upper Piru Creeks on the Los Padres National Forest. As described in Alternative 3, Alternative 6 would also relocate conflicting uses from riparian areas, prioritize land acquisition for biodiversity benefits, and put more of an emphasis on prescribed burning for enhancement of species-at-risk habitat. Biodiversity is the primary emphasis of Alternative 6. There is more public non-motorized land use zoning in this alternative than in any other alternative.

Alternatives 2, 3, and 6 have more land use special designations (recommended wilderness, Research

Natural Areas, Special Interest Areas and Wild and Scenic Rivers, etc.) that would inherently protect a portion of the land base and species from increased human use, disturbance and extractive demands due to less accessibility and higher biodiversity management emphasis.

Grazing is basically the same for Alternatives 1-5, while Alternative 6 has 20 percent less grazed area than the other alternatives. Grazing standards in the Plan would manage this land utilization.

The arroyo toad is listed under the Endangered Species Act of 1973, as amended, as endangered; which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the U.S. Fish and Wildlife Service at the site-specific level.

Viability outcome for all lands

Predicted Outcomes by Alternative

| | | | | | | |
|---|---|---|---|----|---|---|
| 1 | 2 | 3 | 4 | 4a | 5 | 6 |
| D | C | C | D | C | D | C |

The arroyo toad inhabits both perennial and intermittent rivers and streams with shallow, sandy to gravelly pools adjacent to sand or fine gravel terraces (U.S. Fish and Wildlife Service 2000). Off-national forest streams adjacent to National Forest System lands are in continuing decline, especially in urban areas where development brings an increased demand for water and increased diversion and stream channelization. Riparian and stream habitat on private land will continue to be impacted from the predicted rapid development. As previously mentioned, changes to the hydrologic regime in drainages where they occur, loss and/or degradation of aquatic and upland habitat, predatory exotic species, and blockages to individual dispersal are the primary threats to this species. Urban encroachment into riparian areas and stream channels is expected to continue as human populations increase dramatically over the next 15-20 years.

The widespread occurrences of invasive nonnative aquatic plant species in many low elevation streams result in effects to the riparian vegetative structure, consumption of large quantities of water, and pose an immediate threat to streams on National Forest System lands. These infestations will continue to have a detrimental effect on aquatic and riparian habitat, as stream conditions are degraded.

National forest lands play an important role in protecting a large portion of existing populations of this species. Streams and riparian areas on the National Forests can serve an important role in southern California through time. The combination of environmental (habitat) and population conditions only allows continued species existence in isolated patches relative to the historic distribution, with strong limitations on interactions or within local populations.

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Arboreal Salamander

**California (Pacific) Giant
Salamander**