88. If the Commission were to take action to ensure the effective implementation of the technical standards for the display of closed captioning, it may impose additional compliance obligations on television manufacturers and VPDs, including small entities. In determining whether to require any other practices governing technical standards for the display of closed captioning, the Commission will consider the costs and burdens of such practices compared with the benefits of greater accessibility to television programming.

89. If the Commission were to adopt rules governing on-screen visual changes or textual depictions that obstruct closed captioning, it may impose additional compliance obligations on VPDs and video programmers, including small entities. In determining whether to require any other practices governing on-screen visual changes or textual depictions that obstruct closed captioning, the Commission will consider the costs and burdens of such practices compared with the benefits of greater accessibility to television programming.

90. If the Commission were to adopt rules governing display of closed captioning, closed captioning of 3D television or Ultra HDTV programming, it may impose additional compliance obligations on television manufacturers and VPDs, including small entities. However, VPDs are already subject to rules governing the display of closed captioning and are required to reliably encode, transport, and render closed captions on 3D and Ultra HDTV video programming in accordance with Commission rules. Also, in accordance with the Commission's captioning rules, such VPDs and providers must permit the pass through or rendering of closed captions in a manner that will allow viewers to exercise control over various display features and to activate and deactivate captions when video programming is played back on television receivers with 3D or Ultra HDTV capability. Finally, interconnection mechanisms and standards for 3D and Ultra HDTV video source devices must be capable of conveying from the source device to the consumer equipment the information necessary to permit or render the display of closed captions. In determining whether to require any other practices for the display of closed captioning or captioning 3D television or Ultra HDTV, the Commission will consider the costs and burdens of such practices compared with the benefits of greater accessibility to television programming.

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

Ordering Clauses

Pursuant to sections 4(i), 303(r) and 713 of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 303(r) and 613, document FCC 14–12 *is adopted.*

The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, *shall send* a copy of document FCC 14–12 including the Initial Regulatory Flexibility Certification, to the Chief Counsel for Advocacy of the Small Business Administration.

Federal Communications Commission.

Marlene H. Dortch,

Secretary.

[FR Doc. 2014–06755 Filed 3–26–14; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R8–ES–2014–0007; FXES11130900000–145–FF09E42000]

RIN 1018–AY82

Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To Downlist the Arroyo Toad (Anaxyrus californicus), and a Proposed Rule To Reclassify the Arroyo Toad as Threatened

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule and 12-month petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service, announce a 12-month finding on a petition to reclassify the arroyo toad (*Anaxyrus californicus*) as threatened under the Endangered Species Act of 1973, as amended (Act). After review of all available scientific and commercial information, we find that reclassifying the arroyo toad as threatened is warranted, and, therefore, we propose to reclassify the arroyo toad as threatened under the Act. We are seeking information and comments from the public regarding this proposed rule.

DATES: We will accept comments received or postmarked on or before May 27, 2014. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section by May 12, 2014.

ADDRESSES: *Comment submission:* You may submit comments by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal: *http://www.regulations.gov.* In the Search box, enter FWS–R8–ES–2014–0007, which is the docket number for this rulemaking. Then, in the Search panel on the left side of the screen, under the Document Type heading, click on the Proposed Rules link to locate this document. You may submit a comment by clicking on ''Comment Now!''

(2) *By hard copy:* Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS–R8–ES–2014–0007; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042–PDM; Arlington, VA 22203.

We request that you send comments only by the methods described above. We will post all comments on *http://www.regulations.gov.* This generally means that we will post any personal information you provide us (see the Information Requested section below for more information).

Document availability: A copy of the Species Report referenced throughout this document can be viewed at *http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D020,* at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2014–0007, or at the Ventura Fish and Wildlife Office's Web site at *http://www.fws.gov/ventura/.*

FOR FURTHER INFORMATION CONTACT: Stephen P. Henry, Deputy Field Supervisor, U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, CA 93003; telephone 805–644–1766; facsimile 805–644–3958. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Purpose of Regulatory Action. In December 2011, we received a petition to reclassify the arroyo toad from endangered to threatened, based on analysis and recommendations contained in our August 2009 5-year status review of the species. On June 4, 2012, we published a 90-day finding that the petition presented substantial information indicating that reclassifying the arroyo toad may be warranted (77 FR 32922) and initiated a status review. After review of all available scientific and commercial information, we find that the petitioned action is warranted and propose to reclassify the arroyo toad

from an endangered species to a threatened species on the Federal List of Endangered and Threatened Wildlife. This document constitutes our 12-month finding in response to the petition to reclassify the arroyo toad from endangered to threatened.

The basis for our action. Under the Act, we can determine that a species is an endangered species or threatened species because of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We must consider whether or not the species is an endangered species or threatened species because of the same factors when we consider reclassifying or delisting a species.

We have determined that there are still significant threats impacting the arroyo toad currently and into the future, particularly operation of dams and water diversions (Factors A and E); urban development (Factors A and E); introduced predator species (Factors A and C); and drought (Factors A and E). However, despite the existence of these ongoing threats, we conclude that the overall magnitude of threats impacting the arroyo toad has decreased since the time of listing, due in part to implementation of conservation and management actions. Furthermore, we find that the intent of the recovery criteria for downlisting of the arroyo toad has been met, and that the arroyo toad now fits the definition of a threatened rather than an endangered species.

Information Requested

We intend that any final action resulting from this proposal will be based on the best scientific and commercial data available, and be as accurate and as effective as possible. Therefore, we request comments or information from other governmental agencies, tribes, the scientific community, industry, or other interested parties concerning this proposed rule. We particularly seek comments concerning:

(1) Reasons why we should or should not reclassify the arroyo toad under the Act (16 U.S.C. 1531 *et seq.*).

(2) New biological or other relevant data concerning any threat (or lack thereof) to this species.

(3) New information concerning the distribution and population size or trends of this species.

(4) New information on the current or planned activities within the range of the arroyo toad that may adversely affect or benefit the species.

(5) New information and data on the projected and reasonably likely impacts to the arroyo toad or its habitat associated with climate change.

(6) New information on threats or impacts to the arroyo toad in the Mexico portion of its range.

Please include sufficient information with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include. Please note that submissions merely stating support for or opposition to the action under consideration without providing supporting information, although noted, will not be considered in making a determination, as section 4(b)(1)(A) of the Act directs that determinations as to whether any species is an endangered or threatened species must be made ''solely on the basis of the best scientific and commercial data available.''

You may submit your comments and materials concerning this proposed rule by one of the methods listed in the **ADDRESSES** section. We request that you send comments only by the methods described in the **ADDRESSES** section. If you submit information via *http://www.regulations.gov,* your entire submission—including any personal identifying information—will be posted on the Web site. If your submission is made via a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on *http://www.regulations.gov.*

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on *http://www.regulations.gov,* or by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Public Hearings

Section 4(b)(5) of the Act provides for one or more public hearings on this proposal, if requested. We must receive your request within 45 days after the date of this **Federal Register** publication. Send your request to the address shown in **FOR FURTHER INFORMATION CONTACT**. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing.

Peer Review

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (50 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule. A thorough review of information that we relied on in preparing this proposed rule—including information on taxonomy, life history, ecology, population distribution and abundance, and potential threats—is presented in the arroyo toad Species Report (Service 2013) available at *http://www.regulations.gov* (Docket Number FWS–R8–ES–2014–0007). The purpose of peer review is to ensure that decisions are based on scientifically sound data, assumptions, and analyses. The peer reviewers will conduct assessments of the proposed rule, and the specific assumptions and conclusions regarding the proposed downlisting. These assessments will be completed during the public comment period.

We will consider all comments and information we receive during the comment period on this proposed rule as we prepare the final determination. Accordingly, the final decision may differ from this proposal.

Previous Federal Action

We proposed to list the arroyo toad as an endangered species under the Act on August 3, 1993 (58 FR 41231), based primarily on threats from urban development, agricultural conversion, construction of new dams, roads and road maintenance, recreational activities, introduced predator species, and drought. We published a final rule listing the arroyo toad as an endangered species on December 16, 1994 (59 FR 64859). We published a recovery plan for the arroyo toad in 1999 (Service 1999). Critical habitat was designated in 2001 (66 FR 9414, February 7, 2001) and revised in 2005 (70 FR 19562, April 13, 2005) and 2011 (76 FR 7246, February 9, 2011).

Under the Act, we maintain the Lists of Endangered and Threatened Wildlife and Plants at 50 CFR 17.11 (for animals) and 17.12 (for plants) (Lists). We amend the Lists by publishing final rules in the **Federal Register**. Section 4(c)(2)(A) of the Act requires that we conduct a review of listed species at least once every 5 years. Section 4(c)(2)(B) requires that we determine: (1) Whether a

species no longer meets the definition of endangered or threatened and should be removed from the Lists (delisted), (2) whether a species listed as endangered more properly meets the definition of threatened and should be reclassified to threatened (downlisted), or (3) whether a species listed as threatened more properly meets the definition of endangered and should be reclassified to endangered (uplisted). In accordance with 50 CFR 424.11(d), using the best scientific and commercial data available, we will consider a species for delisting only if the data substantiate that the species is neither endangered nor threatened for one or more of the following reasons: (1) The species is considered extinct; (2) the species is considered recovered; or (3) the original data available when the species was listed, or the interpretation of such data, were in error.

We published a notice announcing active review and requested public comments concerning the status of the arroyo toad under section 4(c)(2) of the Act on March 5, 2008 (73 FR 11945). We notified the public of completion of the 5-year review on May 21, 2010 (75 FR 28636). The 5-year review, completed on August 17, 2009 (Service 2009), resulted in a recommendation to change the status of the species from endangered to threatened. A copy of the 2009 5-year review for the arroyo toad is available on the Service's Environmental Conservation Online System (*http://ecos.fws.gov/docs/five_year_review/doc2592.pdf*).

On December 21, 2011, we received a petition dated December 19, 2011, from the Pacific Legal Foundation, requesting the Service to delist the Inyo California towhee (*Pipilo crissalis eremophilus*), and to reclassify from endangered to threatened the arroyo toad *(Anaxyrus californicus),* Modoc sucker (*Catostomus microps*), *Eriodictyon altissimum* (Indian Knob mountainbalm), *Astragalus jaegerianus* (Lane Mountain milk-vetch), and *Hesperocyparis abramsiana* (Santa Cruz cypress). The petition was based on the analysis and recommendations contained in the most recent 5-year reviews for these taxa. On June 4, 2012 (77 FR 32922), we published in the **Federal Register** a 90-day finding for the 2011 petition to reclassify these six taxa. In our 90-day finding, we determined the 2011 petition provided substantial information indicating the petitioned actions may be warranted, and we initiated status reviews for each species.

In April 2013, we received a complaint on our failure to complete 12-month findings on the above-mentioned species, including the arroyo toad (Case No. 2:13–cv–00800–GEB–AC; April 24, 2013). In August 2013, we settled that case by committing to a schedule for completing all of the 12-month findings; the settlement date for completion of the arroyo toad finding is March 21, 2014. This proposed downlisting rule constitutes the 12-month finding on the 2011 petition to reclassify the arroyo toad and our latest 5-year status review for the species. We are addressing the 12-month findings for the other petitioned species separately.

Background

A scientific analysis of the status of the species is presented in detail within the arroyo toad Species Report (Service 2013, entire), which is available at *http://www.regulations.gov* at Docket Number FWS–R8–ES–2014–0007. The Species Report was prepared by Service biologists to provide thorough discussion of the species ecology, biological needs, and analysis of the threats that may be impacting the species. The Species Report includes discussion of the following: life history; taxonomy; habitat requirements; species range, distribution, and abundance; threats analysis; and progress towards recovery. This detailed information is summarized in the following paragraphs of this **BACKGROUND** section and the Summary of Factors Affecting the Species section.

The arroyo toad is a small, stocky, warty toad that is about 2 to 3 inches (in) (5.1 to 7.6 centimeters (cm)) in length (Stebbins 2003, p. 212). The skin of this toad is light olive green, gray, or light brown in color with a light-colored stripe shaped like a ''V'' across the head and eyelids. The belly is white or buff colored, usually without spots. Arroyo toads are found in low-gradient, medium-to-large streams and rivers with intermittent and perennial flow in coastal and desert drainages in central and southern California and Baja California, Mexico. Arroyo toads occupy aquatic, riparian, and upland habitats in the remaining suitable drainages within its range. Arroyo toads are breeding habitat specialists and need slow-moving streams that are composed of sandy soils with sandy streamside terraces (Sweet 1992, pp. 23–28). Reproduction is dependent upon the availability of very shallow, still, or low-flow pools in which breeding, egg-laying, and tadpole development occur. Suitable habitat for the arroyo toad is created and maintained by periodic flooding and scouring that modify stream channels, redistribute channel sediments, and alter pool location and form. These habitat requirements are largely dependent upon natural hydrological cycles and scouring events (Madden-Smith *et al.* 2003, p. 3).

At the time the species was listed, it was classified as a subspecies (*Bufo microscaphus californicus*) of the southwestern toad (*B. microscaphus*). However, the taxonomy of the arroyo toad was reexamined (Gergus 1998, entire), and as a result, in 2001, we formally changed the name on the List of Endangered and Threatened Wildlife to *B. californicus* (66 FR 9414, February 7, 2001). Based on a phylogenetic analysis of comparative anatomical and molecular genetic data for amphibians (Frost *et al.* 2006, p. 363) that was accepted by the scientific community, we again formally changed the name on the List to *Anaxyrus californicus* in 2011 (76 FR 7246, February 9, 2011).

The arroyo toad was once relatively abundant in the coastal portions of central and southern California. At the time of listing, arroyo toads were known to occur in 22 river basins from the upper Salinas River system in Monterey and San Luis Obispo Counties; south through the Santa Maria and Santa Ynez River basins in Santa Barbara County; the Santa Clara River basin in Ventura County; the Los Angeles River basin in Los Angeles County; river basins of Orange, Riverside, and San Diego Counties; and south to the Arroyo San Simeon system in Baja California, Mexico (Sweet 1992, p. 18; Service 1999, p. 12; Service 2013, Map 1). Prior to the time of listing, Jennings and Hayes (1994, p. 57) documented a decline of 76 percent of arroyo toad populations throughout the species' range due to loss of habitat and hydrological alterations to stream systems as a result of dam construction and flood control. This figure was based on studies done in the early 1990s by Sam Sweet (Jennings and Hayes 1994, p. 57) that addressed the natural history and status of arroyo toad populations on a portion of the species' range on the Los Padres National Forest.

Though arroyo toads have been extirpated from some rivers and streams within river basins that they occupied at the time of listing, the number of areas known to be occupied by arroyo toads has increased since the time of listing, mostly due to increased survey efforts. Although Jennings and Hayes (1994, p. 57) estimated that arroyo toads had been eliminated from 76 percent of their historical range prior to the time of listing, subsequent discoveries of new localities and remnant populations reduce this estimate to 65 percent (Lanoo 2005, p. 4). We now consider there to be a total of 35 river basins that support arroyo toads with 25 in the United States and 10 in Mexico; arroyo

toads are still extant in all 22 river basins occupied at the time of listing. Currently, arroyo toads are limited to isolated populations primarily in the headwaters of coastal streams along the central and southern coast of California and southward to Rio Santa Maria near San Quintin in northwestern Baja California, Mexico (Lovich 2009, p. 62).

The 1999 recovery plan divided the range of the arroyo toad into three recovery units: the Northern Recovery Unit, the Southern Recovery Unit, and the Desert Recovery Unit. The recovery plan did not address river basins in Baja California, Mexico. In the Species Report, we analyzed threats by river basin, grouping those basins by recovery unit. We also considered all known occurrences in Baja California, Mexico. Based on new distribution information and correction of some locality records now known to be in error (Ervin *et al.* 2013, pp. 197–204), we updated the river basins in each recovery unit for the purposes of our analysis (Service 2013, p. 15, Map 1, Table 1).

The Northern Recovery Unit consists of the following five river basins: Salinas, Santa Maria, Santa Ynez, Santa Clara, and Los Angeles (Service 1999, Table 1; Service 2013, Table 1). The Southern Recovery Unit consists of the following river 18 basins: Lower Santa Ana, Upper Santa Ana, San Jacinto, San Juan Creek, San Mateo Creek, San Onofre Creek, Lower Santa Margarita, Upper Santa Margarita, Murrieta Creek, Lower and Middle San Luis Rey, Upper San Luis Rey, Lower Santa Ysabel Creek, Upper Santa Ysabel Creek, Upper San Diego, Lower Sweetwater, Upper Sweetwater, Lower Cottonwood Creek, and Upper Cottonwood Creek (Service 1999, Table 1; Service 2013, Table 1). The Desert Recovery Unit consists of the following two river basins: Antelope-Fremont and Mojave (Service 1999, Table 1; Service 2013, Table 1). Baja California includes the following 10 river basins: Rio Las Palmas, Rio Guadalupe, Arroyo San Carlos, Rio El Zorillo, Rio Santo Tomas, Rio San Vincente, Rio San Rafael, Rio San Telmo, Rio Santo Domingo, and Rio Santa Maria. Of those 25 river basins in the United States and an additional 10 river basins in Baja California, Mexico, 28 contain arroyo toad occurrences that are extant or presumed to be extant, and many of these contain multiple populations of arroyo toads in different creeks and rivers (Service 2013, Table 1). Identification of the river basins containing occurrences that are known to be or presumed to be extant is based solely on the existence of reliable surveys or sightings of arroyo toads in recent years (Service 2013, p. 18, Table 1). The statuses of the remaining seven occurrences are unknown, because no surveys have been conducted in the past 6 years.

Summary of Factors Affecting the Species

Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for listing species, reclassifying species, or removing species from listed status. ''Species'' is defined by the Act as including any species or subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature (16 U.S.C. 1532(16)). A species may be determined to be an endangered or threatened species because of any one or a combination of the five factors described in section 4(a)(1) of the Act: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or human-made factors affecting its continued existence. A species may be reclassified on the same basis.

Determining whether the status of a species has improved to the point that it can be downlisted requires consideration of whether the species is endangered or threatened because of the same five categories of threats specified in section 4(a)(1) of the Act. For species that are already listed as endangered or threatened, this analysis of threats is an evaluation of both the threats currently facing the species and the threats that are reasonably likely to affect the species in the foreseeable future following the delisting or downlisting and the removal or reduction of the Act's protections.

A species is an ''endangered species'' for purposes of the Act if it is in danger of extinction throughout all or a significant portion of its range and is a ''threatened species'' if it is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The word ''range'' in the significant portion of its range phrase refers to the range in which the species currently exists, and the word ''significant'' refers to the value of that portion of the range being considered to the conservation of the species. The ''foreseeable future'' is the period of time over which events or effects reasonably can or should be anticipated, or trends extrapolated. For the purposes of this analysis, we first evaluate the status of the species throughout all its range, then consider whether the species is in danger of extinction or likely to become so in any significant portion of its range.

At the time of listing, the primary threats to the arroyo toad were urban development, agricultural conversion, construction of new dams, roads and road maintenance, recreational activities, introduced predator species, and drought (59 FR 64859; December 16, 1994). Other threats identified in 1994 included livestock grazing, mining and prospecting, and alteration of the natural fire regime (59 FR 64859).

Most of the threats identified at the time of listing are still impacting the arroyo toad and its habitat; however, in many cases, the way in which they impact the species has changed. Some new threats have also been identified. Current or potential future threats to the arroyo toad include urban development (Factors A and E), agriculture (Factors A and E), operation of dams and water diversions (Factors A and E), mining and prospecting (Factors A and E), livestock grazing (Factors A and E), roads and road maintenance (Factors A and E), recreation (Factors A and E), invasive, nonnative plants (Factors A and E), introduced predator species (Factors A and C), drought (Factors A and E), fire and fire suppression (Factors A and E), and effects of climate change (Factors A and E) (Service 2013, pp. 32–87). Threats identified at the time of listing that have been found either to be of no concern, insignificant concern, or negligible at this time include construction of new dams (Factor A), collection for recreational or scientific purposes (Factor B), and disease (Factor C); the best available scientific and commercial information indicates that these are not threats at this time (Service 2013, p. 28). Inadequacy of existing regulatory mechanisms (Factor D) was not considered to be a threat at the time of listing, and is not considered to be a threat now (Service 2013, pp. 28–29).

In the Species Report, we examined the scope and severity of threats. The severity of threats measures the degree of impact to arroyo toad populations or habitat. The scope of the threat considers the proportion of arroyo toad occurrences that are reasonably expected to be affected by a threat. The interaction between scope and severity provided the overall impact of the threat, which we classified as very high, high, medium, or low. A very high threat impact was one with extreme severity and pervasive scope; a high threat impact had large scope and extreme or serious severity; a medium threat impact had a more restricted

scope and high severity, or more widespread scope and moderate severity; and a low threat impact had either small or restricted scope and a slight or moderate severity (Service 2013, pp. 29–31).

The following sections provide a summary of the current threats impacting the arroyo toad.

Urban Development

At the time of listing, urban development caused both permanent loss of riparian wetlands and ongoing degradation of riparian habitat that supported arroyo toads. At that time, habitat loss and degradation were extensive in rivers of southern California as a result of agricultural and urban development (Griffin *et al.* 1999, p. 5). Since then, conservation measures have reduced the amount and scale of direct habitat loss due to urban development, and many river basins have land protected from development by State, Federal and local agencies, including four river basins in Mexico that occur in part within the boundaries of national parks. However, not all land is protected, and urban development impacts are expected to continue. Today, 23 of the 35 river basins occupied by arroyo toads are affected by both direct and indirect effects of urban development, including 18 river basins in the United States (Service 2013, pp. 34–35).

Permanent loss and alteration of arroyo toad habitat is caused by activities that include: construction and maintenance of infrastructure; alteration of stream dynamics; declines in water quality; stabilization of stream banks; and maintenance of flood, drainage, and water quality protection features. In addition to the loss and alteration of habitat, construction activities can directly kill, injure, or limit foraging and breeding by arroyo toads by excluding arroyo toads from portions of their habitat that are present within a development project area (Campbell *et al.* 1996, p. 15; Service 1999, p. 40; Service 2013, pp. 34, 80–81).

Though losses of small amounts of habitat due to urban development still occur, urban development more commonly impacts arroyo toads and their habitat through alteration of stream dynamics and water quality. Stream dynamics can be altered by both groundwater extraction and increased surface flows. Groundwater extraction related to urban development reduces the amount of surface flow available for creeks and rivers. This reduction in water can be detrimental to arroyo toads because they require breeding pools that persist for at least 2 months in the summer for larval development and tadpole metamorphosis (Campbell *et al.* 1996, p. 6). Extraction can also lower groundwater levels below the depth that streamside or wetland vegetation needs to survive, resulting in a loss of riparian vegetation and habitat (USGS 2012). Production from groundwater supplies in San Diego County is anticipated to increase 75 percent by 2015 (CEC 2009, p. 19). Currently, the City of San Diego is considering groundwater extraction in San Pasqual Valley (lower Santa Ysabel Creek) (Brown, USGS, pers. comm. 2012).

Arroyo toads and their habitat can also be impacted by increased surface flows due to urban runoff. Generally, increases in surface runoff, particularly during large storm events, can affect arroyo toads by disrupting breeding and by sedimentation which buries eggs or displaces adults and juveniles (Service 2013b, p. 17). Increased flows in streams due to urban runoff can also lead to changes in the invertebrate communities that may lead to decreased survival of arroyo toad tadpoles due to competition or predation, and may reduce the food supply for post-metamorphic toads (Service 1999, p. 41). Alterations to surface flows resulting from groundwater extraction or increased surface runoff can impact all stages of arroyo toad life history and alter breeding habitat.

Urban runoff from storm events or from regularly occurring irrigation of urban areas may also decrease the water quality in streams and rivers that support arroyo toads. Runoff from roads, residential housing, and golf courses often contains chemicals that are toxic to wildlife (for example, car fluids, pesticides, and herbicides) (Service 1999, p. 41). Arroyo toads are exposed to hazardous materials by absorbing them through their skin from the water or contaminated vegetation, or by ingesting them from contaminated vegetation, prey species, or water. However, the life-history characteristics of arroyo toads may decrease the impacts of contaminated runoff. Sweet (1992, pp. 54–57) observed that arroyo toads almost never breed in pools that are isolated from the flowing channel and where contaminants would be found in highest concentrations. Arroyo toads may use side channels and washouts as long as there is some flow through them, but they are abandoned as soon as this flow ceases (Lanoo 2005, p. 2). Therefore, the arroyo toad's sensitivity to aquatic contaminants may be decreased.

Despite these impacts, the amount of urban development resulting in the destruction and removal of arroyo toad habitat has largely decreased since the time of listing, as much of the undeveloped arroyo toad habitat is now conserved in protected areas. Of the 25 river basins that support arroyo toads and their habitat in the United States, 20 contain land owned and managed in part by State or Federal agencies (Service 2013, Table 1). The impacts that do remain from urban development on private or locally owned land have been reduced through conservation measures. These additional measures have been put in place on privately and locally owned land at 10 of 18 river basins in the United States impacted by urban development: 1 river basin in the Northern Recovery Unit, and 9 river basins in the Southern Recovery Unit.

In the Northern Recovery Unit, a proposed East Area 1 project in Santa Paula (EDC 2012) and current and future development plans for Newhall Ranch have the potential to reduce or eliminate much of the suitable arroyo toad habitat in this area; however, to reduce the impacts associated with urban development, Newhall Ranch developed a Natural Resource Management Plan (NRMP) for the Santa Clara River. The plan provides measures designed to protect, restore, monitor, manage, and enhance habitat for multiple species, including the arroyo toad (EDC 2012, entire). Of particular importance to the conservation of the arroyo toad and its habitat are the substantial conservation easements that are included in the NRMP, which, when completed, will protect almost all arroyo toad breeding habitat and riparian habitat within the Newhall Ranch development. At the present time, approximately 1,011 ac (409 ha) of Newhall Ranch lands have been conveyed to the California Department of Fish and Wildlife (CDFW), and additional easements are awaiting approval.

Since the time of listing, multiple habitat conservation plans (HCPs) have been implemented in the Southern Recovery Unit to provide protection to the arroyo toad and decrease habitat loss and alteration due to urbanization. These HCPs are responsible for placing land within seven river basins into reserves; for example, all arroyo toad habitat within the Orange County Central-Coastal Natural Community Conservation Plan (NCCP) (Lower Santa Ana River Basin) is within reserves. Within the Orange County Central-Coastal NCCP reserves, monitoring and management related to the arroyo toad have included reserve-wide herpetofauna surveys conducted from 1997 through 2001 and ongoing control of invasive, nonnative vegetation in the upland environment. Development of

adaptive management plans for the arroyo toad within these and other dedicated reserves within HCPs is being planned for the future, but is not yet in place. Additional land within five river basins has been acquired by Federal, State and local government. These conservation measures have resulted in land acquisition in 9 of the 14 river basins in the Southern Recovery Unit impacted by urban development.

Very limited information is available on the effects of urban development in Mexico. We are aware that urban development is occurring at five river basins within Mexico (Lovich 2009, pp. 77, 85); however, the magnitude of impacts at these locations from urban development is unclear.

Urban development continues to impact the arroyo toad throughout its range. Though altered flow regimes and other indirect effects from development continue to impact habitat that supports the arroyo toad, the amount of direct destruction and removal of habitat has decreased. This decrease in the severity of direct habitat loss from urban development since the time of listing is due to the amount of land within river basins in the United States that has been added to reserves though local HCPs and that overall is managed by state or Federal agencies (for more details on land ownership, see Table 1 in Service 2013). The reduction in the threat of urban development is also due to conservation measures that have been put in place on private and locally owned land to reduce, eliminate, or mitigate for the existing and future effects of urban development. Although urban development continues to pose a threat to the continued existence of the arroyo toad, the magnitude of this threat has decreased since the time of listing on local and private lands at 10 of the 25 river basins in the United States described above where conservation plans are being implemented. In these river basins, arroyo toad occurrences are no longer at risk of being extirpated through permanent loss and destruction of riparian habitat. However, indirect effects of development, such as altered flow regimes, continue to cause longer term alterations to arroyo toad populations and the habitat that supports them. These alterations, while not likely to result in immediate extirpation of populations, can reduce the rates of survival and reproduction within populations, and result in a long-term decline in populations.

Even with the conservation actions described above, we still consider urban development is a threat with high impact to the arroyo toad and its habitat. Urban development currently has a large scope (affects portions of 23 out of the 35 occurrences of arroyo toad) and a serious severity, as it poses immediate and ongoing impacts to the species (Service 2013, p. 37). We also conclude that the current effects from urban development, while no longer likely to directly destroy habitat or result in immediate extirpation of occurrences, continue to degrade habitat and affect the health of the populations of arroyo toads. We consider overall that urban development is a threat with a high level of impact to the arroyo toad and its habitat (Service 2013, pp. 32–37).

Agriculture

At the time of listing, habitat loss and degradation from agricultural development was a major threat to the continued existence of the arroyo toad. Today, direct loss of habitat from agricultural development is no longer considered a threat. However, ongoing agricultural practices are known to impact arroyo toads and their habitat. These practices currently convert stream terraces and upland habitats adjacent to occupied arroyo toad habitat to farmland and road corridors, eliminate foraging and burrowing habitat for arroyo toads, and create barriers to dispersal. Streams may also be diverted for agricultural use, resulting in permanent loss of arroyo toad breeding habitat. Currently, 15 of the 35 river basins that support arroyo toads are impacted by agricultural practices.

Agricultural use adjacent to riparian areas can result in direct mortality of adult arroyo toads, as agricultural fields can act as ecological traps for arroyo toads. Toads are often attracted to agricultural fields for cover, food, and moisture, and can be killed by trampling, chemicals, and machinery (Griffin and Case 2001, pp. 641–642). In the Griffin and Case study (2001, p. 641), more than half of the male arroyo toads observed after July 29 were active in burrows or made new burrows in agricultural lands adjacent to breeding habitat. Mechanized tilling, pesticide application, and trampling were frequently observed in these agricultural fields within the study site (Griffin and Case 2001, p. 641).

Another concern related to agricultural development is agricultural runoff. As discussed in the *Urban Development* section above, runoff contains contaminants such as herbicides, pesticides, and fertilizers that may kill toads, affect development of larvae, or affect their food supplies or habitat (Service 1999, p. 41). For example, granular fertilizers, particularly ammonium nitrate, are highly caustic and have caused mass injuries and mortality to frogs and newts in Europe (Schneeweiss and Schneeweiss 1997 *in* Service 1999, p. 41). Though arroyo toads primarily inhabit areas with moving water (Lanoo 2005, p. 2), they may also be more susceptible to areas with chemical contamination in both terrestrial and aquatic environments, because their life history involves both aquatic larvae and terrestrial adult stages.

Since the time of listing, actions have been taken to reduce the impact of agriculture on arroyo toads and their habitat at two occurrences in the United States. An agricultural lease was discontinued on Marine Corps Base (MCB) Camp Pendleton adjacent to lower San Mateo Creek, where impacts to arroyo toads were documented in the Griffin and Case (2001) study. Also, within City of San Diego lands encompassing lower Santa Ysabel Creek, some agricultural leases have been moved away from riparian areas (McGinnis, City of San Diego, pers. comm. 2012).

Very limited information is available on the effects of agriculture to arroyo toads and their habitat in Mexico. We are aware that agriculture is affecting five river basins in Mexico, three of which are specifically impacted by groundwater pumping for irrigation (Lovich 2009, p. 85); however, the magnitude of these impacts is unclear.

Because arroyo toads use both aquatic and terrestrial environments, they are doubly impacted by agricultural activities that subject their habitats to increased fragmentation and decreased water quality. Efforts since the time of listing have removed the threat of direct habitat loss due to agricultural development, and reduced the impact of agricultural use near some occurrences. However, despite these efforts, this threat has a large scope, as impacts from agriculture continue throughout most of the species' range at 15 of 35 river basins. Though arroyo toad occurrences are no longer at risk of being extirpated through permanent conversion of riparian habitat to agriculture, arroyo toad populations may experience impacts such as alteration of water quality and barriers to dispersal; as such, we conclude that this threat has a moderate severity. While not likely to result in immediate extirpation of populations, these effects can cause mortality of individuals and reduce the rates of survival and reproduction within populations, and result in a long-term decline in populations. Therefore, we conclude that agriculture has a moderate level of impact to the arroyo toad and its habitat (Service 2013, pp. 37–39).

Operation of Dams and Water Diversions

Prior to listing, short- and long-term changes in river hydrology, including construction of dams and water diversions, were responsible for the loss of approximately 40 percent of the original range of the arroyo toad; furthermore, nearly half of all population extirpations prior to listing are attributed to impacts from original dam construction and operation (Sweet 1992, pp. 4–5; Ramirez 2003, p. 7). Today, the potential for construction of new dams has been greatly reduced, and no dams are presently anticipated to be built in river basins that support arroyo toads. However, water diversions and altered flow regimes due to operation of existing dams continue to affect arroyo toads in 19 of the 35 river basins that support them.

Because river flow forms physical habitats, such as riffles, pools, and bars in rivers and floodplains, the primary impacts to habitat from dams and water diversions are caused by flow alteration. Impacts of flow alteration on arroyo toad habitat include changes in the timing, amount, and duration of channel flows; loss of coarse sediments below the dam; and an increase in vegetation density due to the decrease or elimination of scouring flows (Madden-Smith *et al.* 2003, p. 3).

Arroyo toads and their breeding habitat can also be negatively impacted by sudden releases of excess water from dams. When these releases occur during the breeding season, they can reconfigure suitable breeding pools, thus disrupting clutch and larval development (Ramirez 2003, p. 7). Excessive water releases also wash away arroyo toad eggs and tadpoles, promote the growth of nonnative species, and reduce the availability of open sand bar habitat. For example, at Barrett Dam on Cottonwood Creek, water releases of several million gallons per day during the period when larval arroyo toads were metamorphosing negatively affected the population in San Diego County by washing away potential recruits from that year's population (Campbell *et al.* 1996, p. 15).

Flow alteration also causes habitat modification by promoting the growth of nonnative plants (Jennings and Hayes 1994, p. 56; Campbell *et al.* 1996, pp. 15–16; Madden-Smith *et al.* 2003, p. 3; Service 1999, pp. 42–44). Persistent releases from dams throughout the normal dry season cause changes in vegetation by discouraging the growth of native riparian species such as willow, sycamore, and cattails (*Typha* spp.) while encouraging the growth of some introduced species such as *Tamarix ramosissima* (tamarisk) and *Arundo donax* (giant reed) (Service 1999, p. 43). Increased vegetation density reduces the amount of open streambed and shallow pool habitat preferred by arroyo toads. For example, in Piru Creek, habitat has been degraded by the lack of scouring flows after the construction of Pyramid Dam, leading to an influx of vegetation that has made habitat unsuitable for arroyo toads (Sweet 2012, pers. comm.).

Dams also alter arroyo toad habitat through the creation of reservoirs. Reservoirs turn running water habitats into lake-like systems, resulting in the proliferation of nonnative species that are adapted to still waters and are able to move downstream or upstream of the reservoir (BIP 2012). Additionally, persistent water releases from dams throughout the year changes the water supply from ephemeral to permanent, which maintains nonnative predator populations (Campbell *et al.* 1996, p. 16; Madden-Smith *et al.* 2003, p. 3). Finally, reservoirs block in-stream movement of arroyo toads, which effectively isolates populations upstream and downstream of dams and may preclude recolonization of areas formerly occupied by the arroyo toad (Campbell *et al.* 1996, p. 18).

The ongoing impacts of dam operations to arroyo toads and their habitat have been reduced at four river basins since the time of listing through conservation measures. Recent coordination among the California Department of Water Resources, Forest Service, and Fish and Wildlife Service have resulted in releases from Pyramid Dam into Piru Creek that more closely mimic natural flows, benefitting the arroyo toad (Service 2009). In 2006, the Sweetwater Authority (Authority) implemented a Standard Operating Procedure of Loveland Reservoir to Sweetwater Reservoir water transfers in the lower Sweetwater River so that, if possible, no water is released during the arroyo toad breeding season except in the event of an emergency. Although these procedures are voluntary and may need further review, they improve on the prior conditions (water transfers occurring during the spring), which lessens the impacts to arroyo toads in the lower Sweetwater River.

The City of San Diego (City) has a voluntary internal policy guiding water transfers at two of the City's reservoir systems: (1) Morena Reservoir to Barrett Reservoir to Otay Reservoir; and (2) Sutherland Reservoir to San Vicente Reservoir. This policy minimizes impacts of water transfers to the Lower Cottonwood Creek Basin occurrence below Barrett Dam and the Upper San Diego River Basin occurrence that is above San Vicente Reservoir (it does not affect water transfers within the Upper San Diego River Basin occurrence below Cuyamaca Dam). Water transfers generally occur during winter months between October and March in order to take advantage of existing flows and minimize water lost to the river system, and avoid the breeding season of arroyo toad. City staff coordinates with the Service and contracts with an arroyo toad specialist to monitor before, during, and after a water transfer event (McGinnis, City of San Diego, pers. comm. 2012).

Very limited information is available on the effects of the operation of dams and water diversions in Mexico. Out of the 10 drainages in Mexico where arroyo toads occur, only the Rio Tijuana-Rio Las Palmas drainage has a municipal dam (Lovich 2009, p. 86). Consequently, the magnitude of effects on arroyo toad occurrences from the operation of dams and water diversions in Mexico is unclear.

Overall, the magnitude of the threat posed by the operation of dams and related water diversions has decreased since the time of listing. In four river basins, water releases that more closely mimic natural flow regimes have strongly decreased the impact of dams on local arroyo toad populations. However, within the other 15 river basins with dams and reservoirs, the altered stream dynamics resulting from dam operation result in encouragement of nonnative predators and nonnative, invasive plants, direct removal of habitat that supports arroyo toad populations, reduction of arroyo toad dispersal, and direct mortality of arroyo toads at all life stages. While construction of new dams and reservoirs that would result in destruction of habitat and extirpation of occurrences is not expected, operation of existing dams and reservoirs in 19 river basins will continue to alter the stream dynamics of arroyo toad habitat and affect the long-term survival and reproductive success of arroyo toad populations. Though the magnitude of the impacts from dam operations has decreased since the time of listing, because of the large scope and serious severity posed by the operation of dams and water diversions, we expect that this threat will continue to cause a high level of impact to the arroyo toad and its habitat now and into the future (Service 2013, pp. 39–45).

Mining and Prospecting

At the time of listing, in-stream recreational suction dredging for gold caused localized impacts and population effects to the arroyo toad.

For example, in 1991, during the Memorial Day weekend, four small dredges operating on Piru Creek in the Los Padres National Forest produced sedimentation visible more than 0.8 mi (1 km) downstream and adversely affected 40,000 to 60,000 arroyo toad larvae. Subsequent surveys revealed nearly total loss of the species in this stream section; fewer than 100 larvae survived, and only 4 juvenile toads were located (Sweet 1992, pp. 180–187). Since listing, we have become aware of impacts to arroyo toad habitat from sand and gravel mining, which causes runoff that can degrade arroyo toad habitat. Currently, sand, gravel, and suction dredge mining are taking place in 8 of the 35 river basins occupied by arroyo toads rangewide (Service 2013, p. 46); however, the impact of mining activities has been greatly reduced since the time of listing.

Where sand, gravel, and suction dredge mining activities occur, they can cause substantial alteration of arroyo toad habitat by degrading water quality, altering stream morphology, increasing siltation downstream, and creating deep pools that hold water year-round for introduced predators of arroyo toad eggs and larvae (Campbell *et al.* 1996, p. 16). Mining can also increase water temperature and turbidity and result in degrading or even destroying arroyo toad breeding habitat (CDFG 2005). The increase in suspended sediments in the stream can suffocate arroyo toad eggs and small larvae (Sweet 1992, pp. 179–185; Campbell *et al.* 1996, p. 16). In the case of suction dredge mining, arroyo toad eggs and larvae can also be entrained in the suction pump and killed (Reine and Clarke 1998, pp. 1, 12).

Though some mining activities are currently taking place, their impacts are localized. At two of the six river basins in the United States impacted by mines, for example, sand and gravel extraction continues to degrade habitat and increase sedimentation (Service 2008). Additionally, due to a 2012 change in CDFW regulations, suction dredge mining is now prohibited in Class A streams (Title 14, Natural Resources, §§ 228 and 228.5). Most of the streams and rivers occupied by arroyo toads in the United States are now classified as Class A (24 out of 25 occurrences in the United States), and, therefore, suction dredge mining no longer occurs in those streams. However, suction dredge mining could potentially impact arroyo toads in Lower Cottonwood Creek Basin. These new regulations do not affect current sand and gravel mining practices, which currently occur or have recently occurred at 4 of 25 occurrences in the United States.

In Baja California, Mexico, the sand mining industry is impacting the Rio Guadalupe, Rio Las Palmas, Rio Ensenada, and other smaller coastal arroyos (Lovich 2009, p. 90). Sand and rock are extracted in such large volumes that the hydrology in coastal canyons is affected, and associated riparian habitats are eliminated. The public has demonstrated opposition to this scale of sand mining, but the Mexican Government supports the industry (Lovich 2009, p. 90). Therefore, we find that mining activities pose a threat to the arroyo toad in Mexico (Service 2013, pp. 45–47).

Though some mining activities continue to occur in habitat that supports arroyo toad, these impacts have decreased in magnitude since the time of listing. Furthermore, given the reclassification of streams to disallow suction dredge mining, its impacts are unlikely to increase in the foreseeable future. Overall, as the scope of this threat is low (affecting 8 of 35 river basins rangewide), and the severity of the threat is moderate (likely to moderately degrade habitat or reduce 11 to 30 percent of occurrences), we find that mining activities are having a low level of impact on the arroyo toad in the United States (Service 2013, pp. 47–48).

Livestock Grazing

At the time of listing, we found overgrazing in riparian areas to be a potential source of mortality to arroyo toads, although it was not considered to be one of the factors that most adversely impacted the arroyo toad. Poorly managed grazing is known to have multiple impacts on arroyo toads and their habitat. Pastured cattle (and other livestock) can contribute to stream bank degradation and erosion (Moore 2000, p. 1). Cattle grazing can result in soil compaction, loss or reduction in vegetative bank cover, stream bank collapse, and increased in-stream water temperatures from loss of shade. Cattle can also trample or compact sandbars, preventing burrowing by adult toads (Campbell *et al.* 1996, p. 27). The extent of grazing at the time of listing is unknown; cattle grazing currently occurs at 10 of the 35 arroyo toad occurrences rangewide (Service 2013, pp. 48–49).

Since the time of listing, significant progress has been made toward reducing or eliminating the impact of cattle grazing. The Forest Service has developed grazing allotment management guidelines to reduce the effects of livestock grazing on threatened and endangered species and habitat. Consultation between the Forest Service and the Service through section 7 of the Act on grazing allotment permit renewals has resulted in minimization and mitigation of impacts on arroyo toads (Service 2000a; 2001a; 2001b; 2004a; 2009). Los Padres National Forest has kept the Sisquoc Grazing Allotment in the Santa Maria River Basin vacant for approximately 10 years due to concerns about impacts to arroyo toads and other sensitive riparian species (Cooper 2009, pers. comm.). On the Cleveland National Forest, grazing has a minimal impact because the Forest Service excluded most of the habitat occupied by arroyo toads from grazing allotments during the 1990s. The Cleveland National Forest has also formally excluded grazing from some arroyo toad habitat, including 12,112 ac (4,901 ha) centered around riparian areas (Service 2005, entire), as well as areas with arroyo toad habitat in Lower Santa Ysabel Creek Basin and Upper Cottonwood Creek Basin (Service 2001a, entire). The Pine Valley Allotment, which was the only streamside grazing allotment in the Cleveland National Forest still active at the time of the 5-year review in 2009, is now vacant (Winter 2012, pers. comm.).

Though grazing can result in alteration of the streamside habitat that supports arroyo toads, multiple conservation actions have been put into place since the time of listing. We anticipate that reductions of impacts from grazing will continue to be implemented through the continued implementation of the forest plans, which include minimization measures implemented on grazing allotments issued by Los Padres and Cleveland National Forest. We also expect continued consultation between the Forest Service and the Service through the section 7 consultation process. These two forests manage portions of nine river basins that support arroyo toads. Furthermore, we expect that the conservation measures currently in place will continue to be implemented regardless of the listing status of the arroyo toad.

Some impacts from livestock grazing are occurring in Mexico (Lovich 2009, p. 85); however, the magnitude of these impacts is unclear, and we have no information on how many river basins in Mexico are impacted by grazing activity.

Overall, grazing is a threat with a restricted scope, as only 10 of the 25 river basins in the United States that support arroyo toads are currently affected by livestock grazing. Based on the best available scientific and commercial information, the remaining

15 river basins are not of appropriate land use or habitat type to support grazing; therefore, we do not expect that grazing will occur at these river basins in the future. At the river basins where grazing does occur, reductions in the level of grazing and improved management practices have significantly reduced the impacts to arroyo toads and riparian habitat. We conclude that grazing has a moderate impact on arroyo toads. Although it may result in localized impacts to streams, which reduce the quality of habitat and may cause some decrease in rates of survival and reproduction within populations, it is unlikely to result in a long-term decline in populations. Therefore, we find that grazing is a low-level threat to the arroyo toad and its habitat (Service 2013, pp. 47–50).

Roads and Road Maintenance

When roads occur within or in close proximity to stream habitat that supports arroyo toads, road use, construction and maintenance can have a detrimental impact on arroyo toads and their habitat. Toads are crushed by equipment on the roads or when vehicles use low water crossings during normal daytime project activities. Toads can also be harmed or disturbed when rocks and debris are removed from the road surface or ditches near habitat. On unpaved, sandy roads, toad mortality can occur because increased food sources (ants, other insects) lure toads onto roads at night, and because arroyo toads like to burrow into sandy roadbeds during the day (Sandburg, U.S. Forest Service, pers. comm., 1997). At the time of listing, the use of heavy equipment in yearly reconstruction of roads and stream crossings in the national forests caused ongoing impacts to arroyo toads and their habitat. On the Cleveland National Forest, roads are still identified as one of the top three threats to arroyo toad, along with drought and aquatic predators (Winter, pers. comm. 2012). Currently, impacts from road construction, use, and maintenance on Federal, public, and private lands affect 20 out of the 35 river basins where the arroyo toad is known to occur.

Low water stream crossings pose a particular risk to arroyo toads. Unimproved stream crossings can develop characteristics of suitable toad habitat that attracts arroyo toads—shallow, sand or gravel-based pools with low current velocity and minimal shoreline woody vegetation (USFS 2012, p. 45). Adults burrow during the day but come out at night to forage, so are more likely be killed by nighttime traffic or during wet weather. Vehicles using low water crossings over streams cause increased siltation, which can cover and suffocate egg masses and larvae (Service 2000b, p. 14). Eggs or larvae could also be crushed or disturbed when vehicles use low water crossings (Service 2000b, p. 13). Hardened crossings lack the substrate that toads prefer, but adults will forage on any stream crossing at night (USFS 2012, p. 45).

Apart from direct injury to toads, road maintenance can also alter habitat so that it is unsuitable for arroyo toads. Low water crossing maintenance above or below crossings, such as removal or shaping of sediments, debris, or vegetation, can alter habitat suitability for arroyo toads by increasing the flow over the crossing (USFS 2012, p. 45). Soil disturbance, such as can occur from vehicle use, has been directly implicated in both lethal and sublethal effects on amphibians (Maxell and Hokit 1999, p. 2.11). If not contained, road construction may cause increased sedimentation in adjoining aquatic habitats (Maxell and Hokit 1999, p. 2.11). Traffic on native surface and dirt roads causes soil erosion that can run off into streams, particularly during wet weather. Furthermore, pollutants from exhaust and tire wear can build up along roadsides and enter riparian areas.

Since the time of listing, the impacts of roads and road maintenance have been reduced through conservation measures and protection under the Act. To reduce this threat on Federal lands, Los Padres National Forest reinitiated section 7 consultation (8–8–12–F–43) (Service 2012, entire) with the Service for ongoing activities related to their transportation system and road use in the Santa Clara River Basin and Santa Ynez River Basin. Los Padres National Forest must repair and maintain approximately 1,025 mi (1,649 km) of roads and 137 low water stream crossings on forest lands, and implements best management practices and conservation measures to protect the arroyo toad before conducting any road or water crossing maintenance. Such measures may include pre-construction surveys, relocating individuals to suitable habitat nearby, removing nonnative species, avoiding maintenance during the breeding season, and developing water control plans. In addition, Los Padres National Forest has rerouted trails and closed roads in arroyo toad habitat. In the Southern Recovery Unit, the Angeles, Cleveland, and San Bernardino National Forests have completed similar section 7 consultations to reduce or avoid effects from ongoing road use and maintenance to arroyo toads and habitat within the portions of 11 arroyo toad occurrences that occur on their land. The minimization and mitigation measures within these consultations have been incorporated into recent management plans completed by the Forest Service; the measures in these plans are not dependent on the listing status of the arroyo toad.

Very limited information is available on the effects of roads and road maintenance in Mexico. We are aware that one paved road, Highway 1, is impacting one river basin that supports arroyo toads in Mexico (Lovich 2009, pp. 79, 86); however, the magnitude of impacts from the use and maintenance of this coastal highway is unclear.

Overall, conservation measures have recently reduced the threat of road use and construction and maintenance at three occurrences. Furthermore, we expect to continue to coordinate with our partners through existing section 7 processes to minimize and mitigate the impacts of roads and road maintenance. Overall, this threat has a large scope, affecting 20 of 35 river basins, and a moderate severity, as it can potentially cause effects such as permanent loss of breeding habitat, and creation of barriers to dispersal. Therefore, we find that roads and road maintenance have a moderate level of impact on the arroyo toad and its habitat (Service 2013, pp. 51–54).

Recreation

At the time of listing, recreational activities in riparian wetlands had substantial negative effects on arroyo toad habitat and individuals. Streamside campgrounds in southern California national forests were frequently located adjacent to arroyo toad habitat (Sweet 1992). With nearly 20 million people living within driving distance of the national forests and other public lands in southern California, recreational access and its subsequent effects are an ongoing concern (CDFG 2005). Currently, 22 out of 35 river basins are impacted by recreational facilities and activities, including 13 river basins with land managed by the Forest Service.

Recreational activities that currently affect the arroyo toad are trail use, swimming, trail maintenance, and off-highway vehicle (OHV) activity. Activities such as construction of roads, trails, recreational facilities, and water impoundments may permanently replace natural toad habitat (Maxell and Hokit 1999, p. 2.15). Recreational use may also degrade habitat; for example, grazing by pack horses at stream crossings may impact streamside vegetation or trample various life stages of the arroyo toad (USFS 2013a, p. 17). Additionally, campgrounds focus large

numbers of people and intensive use on limited habitats. Streamside campgrounds in the three southern California National Forests (Los Padres, Angeles, and Cleveland) have frequently been located in or near (165 to 300 feet (ft) (50 to 92 meters (m)) arroyo toad habitat (Sweet 1992, pp. 158–160). In the Los Padres National Forest, almost all occurrences that support arroyo toads are located where hiking trails follow the floodplain and cross the stream channels in multiple locations within a short distance. Streamside campgrounds and recreational activities also reduce riparian vegetation and increase soil erosion and sedimentation that can cover and kill algae, bacteria, and fungi on the surface of rocks that act as food sources for arroyo toad tadpoles (Sweet 1992, p. 190; USFS 2013a, p. 17).

Disturbances created by recreation favor the germination, establishment, and growth of nonnative plant species, substantially altering food availability within a habitat (Service 2013a, pp. 17–18). Furthermore, people swimming and wading in the creek increases the turbidity of water and can create excess sedimentation, which is known to bury eggs or suffocate larvae (Sweet 1992, p. 150). Decreased populations of amphibians including arroyo toads have been found downstream from popular swimming destinations in Cleveland National Forest and Cuyamaca Rancho State Park (Brown, USGS, pers. comm. 2012). Currently, recreational use (mostly campgrounds and swimming) is still impacting six river basins in Cleveland National Forest (Winter, pers. comm. 2012).

OHVs may also pose a threat to arroyo toads. Sweet (1992, pp. 162–163) observed OHV use in arroyo toad breeding sites on the Los Padres National Forest that resulted in the deaths of arroyo toad egg clutches, larvae, and juveniles. OHVs used on sandy, unpaved roads may cause mortality of adult toads because increased food sources (ants, other insects) lure toads onto roads at night and because arroyo toads like to burrow into sandy roadbeds during the day (Sandburg, USFS, pers. comm., 1997). In addition to direct mortality resulting from collisions, OHVs may disrupt habitat to the point that it becomes unusable by herpetofauna (Maxell and Hokit 1999, p. 2.10). OHVs spread seeds of nonnative plants and disturb soils, contributing to excess erosion and sedimentation of aquatic habitats. Noise from on- and off-road vehicles is also likely to have negative indirect impacts on amphibians. Although we did not find studies that targeted arroyo toads specifically, a study by Nash *et al.* (1970), found that leopard frogs exposed to loud noises (120 decibels) remained immobilized for much longer periods of time than a similarly handled control group. Thus, an immobility reaction resulting from noise-induced fear could increase mortality of amphibians that inhabit areas used by OHVs or individuals that are crossing roads by inhibiting their ability to find shelter or move across a roadway (Maxell and Hokit 1999, pp. 2.2–2.10).

Conservation measures have been enacted in habitat surrounding several river basins to reduce or eliminate the impact of recreational activities on arroyo toads and their habitat. The Los Padres, Angeles, Cleveland and San Bernardino National Forests are taking measures to decrease the effects of recreational activities on arroyo toads and their habitat, including seasonal or permanent closure of campgrounds, posting of interpretive signs, closure of trails, installation of stream crossings, and public education programs (Service 1999, pp. 55–56; Service 2003a, entire; Service 2005, entire; Cooper 2009, pers. comm.; USFS 2013b, pp. 1–85).

Where recreational activities occur, they may result in the loss and fragmentation of arroyo toad habitat; however, conservation measures have reduced the effects of recreational use on the arroyo toad and its habitat at 6 of the 22 occurrences where recreational activities occur. We do not have any information on whether recreational activities are impacting river basins that support arroyo toads in Mexico, but we would expect the level and types of recreational activities to be similar and to have similar impacts as in the United States. Overall, because this threat has a large scope, and because it has a moderate level of severity, we conclude that effects from recreational use have a medium level of impact on the arroyo toad and its habitat (Service 2013, pp. 54–59).

Invasive, Nonnative Plants

At the time of listing, invasive, nonnative plants were not identified as a threat to arroyo toads. Since then, nonnative plants have been recorded in 16 of the 35 river basins that support arroyo toads. Nonnative plant species impact arroyo toads and their habitat by altering the natural hydrology of stream drainages and eliminating sandbars, breeding pools, and upland habitats (Service 2009, p. 11). Nonnative plants can be spread by OHVs, recreation, livestock, and camping activities (Maxell and Hokit 1999, p. 2.8). Currently, 16 of 35 river basins are impacted by invasive, nonnative plants.

The most problematic nonnative plant species in aquatic systems in southern California is *Arundo donax* (giant reed), which is widespread along the Ventura, Santa Clara, Santa Ana, Santa Margarita, San Luis Rey, and San Diego Rivers (CDFG 2005). Giant reed invades stream banks and lakeshores, where it can completely displace native vegetation, reduce wildlife habitat, increase fire risk, and alter flow regimes, resulting in flooding (Ventura County 2006, pp. 21–23). Additionally, as of 2010, dense stands of giant reed were still common along sections of the lower Santa Margarita River on MCB Camp Pendleton despite control efforts (Brehme *et al.* 2011, p. 32).

Another problematic nonnative species, *Tamarix ramosissima* (tamarisk), is less widespread than giant reed but also invades riparian habitats in the above-listed rivers and is distributed in coastal and desert drainages (Coffman *et al.* 2005, p. 2724). Tamarisk can replace or displace native woody species such as cottonwood and willow that occupy similar habitats, especially when timing and amount of peak water discharge, salinity, temperature, and substrate texture have been altered by human activities (Carpenter 2004, pp. 1–30). It is an aggressive, woody invasive plant that can tolerate a variety of environmental conditions and has become established over as much as a million acres of floodplains, riparian areas, wetlands, and lake margins in the western United States (Carpenter 2004, pp. 1–30). Tamarisk also consumes large quantities of water, possibly more than woody native plant species occupying the same habitat (Carpenter 2004, p. 3). Highly resistant to removal by flooding, tamarisk has the potential to form dense corridors along most large streams. Where this has been allowed to occur, tamarisk has replaced native vegetation, invaded sand bars, and led to channelization by constricting flood flows. In recent years, tamarisk has been recorded in all watersheds on MCB Camp Pendleton, although large stands persisted only along the lower Santa Margarita River (Brehme *et al.* 2011, p. 32).

Centaurea solstitialis (yellow star thistle) and *Nasturtium officinale* (watercress) are also altering the habitat that supports the arroyo toad. Yellow star thistle is one of the most ecologically and economically damaging nonnative plants in California (UC Davis 2007, p. 1). It is a fast-growing invasive plant whose taproot can reach over 3 ft (1 m) deep into the soil, allowing it to thrive during dry, hot summers. When yellow star thistle becomes well-

established on stream terraces, arroyo toads are unable to dig burrows for shelter or estivation (Sweet 2007a, p. 1). Watercress can also invade arroyo toad habitat. After a fire in the upper Sweetwater River resulted in increased sedimentation that created more breeding habitat for the arroyo toad, watercress subsequently invaded and covered the water surface, and arroyo toad recruitment declined (Brown, USGS, pers. comm. 2012). It is possible that, while reducing available breeding area, the watercress reduced detectability of arroyo toads. However, in sandy open areas, larvae of other toad species were detected while arroyo toads were not (Brown, USGS, pers. comm. 2012). Watercress has become well established in the Lower Santa Margarita River Basin, and scattered patches of watercress have been observed in the upper portions of San Mateo and San Onofre Creeks (Brehme *et al.* 2011, p. 32).

Conservation measures and management are currently being enacted to reduce the impact of nonnative plants on arroyo toads. The Los Padres National Forest has made a concerted effort to remove giant reed and tamarisk from arroyo toad habitat. Forest Service staff and volunteers conduct annual tamarisk removal along portions of Piru Creek, Sisquoc River, Santa Ynez River, and Sespe Creek to protect and restore arroyo toad habitat. At MCB Camp Pendleton, measures mandating control of nonnative plants have been implemented through section 7 consultation (Service 1995, pp. 1, 26, 32, 35). These measures are further described and incorporated into the most recent Integrated National Resources Management Plan (INRMP) for MCB Camp Pendleton (MCB Camp Pendleton 2007, pp. C–1–C–19). Removal efforts on the Base have reduced prevalence of giant reed, with the help of naturally occurring scouring from flooding events. Researchers recommend continued eradication efforts of nonnative plants on MCB Camp Pendleton, particularly those that alter the natural hydrology of watersheds occupied by arroyo toad (Brehme *et al.* 2011, p. 38). Though these efforts have aided in decreasing the threats posed by nonnative plants, management methods of these plants are limited, as control by herbicides and pesticides can have impacts to arroyo toads.

Where invasive, nonnative plants occur, they can degrade arroyo toad habitat and alter stream dynamics. Though conservation measures have been successful in reducing the spread of these nonnative plants at 6 of the 16 occurrences affected by nonnative plants, impacts continue. We do not have any information regarding whether invasive, nonnative plants are impacting river basins that support arroyo toads in Mexico, but would expect that some effects are occurring. While the impact of invasive, nonnative plants will not result in the immediate loss of habitat and extirpation of populations, they will continue to degrade arroyo toad habitat and reduce its carrying capacity over the long term and result in decreased survival and reproduction of affected populations. Overall, due to the large scope and moderate severity of the effects of invasive, nonnative plants on arroyo toads and their habitat, we find that this threat has a medium level of impact (Service 2013, pp. 54–63).

Introduced Predator Species

At the time of listing, nonnative predators had caused substantial reductions in the sizes of extant populations of arroyo toads, and had caused arroyo toads to disappear from large portions of historically occupied habitat (Jennings and Hayes 1994, p. 57). The introduction of nonnative aquatic species has been facilitated by the construction of the California Aqueduct and other sources of inter-basin water transport (Service 1999, p. 48). Today, 28 of 35 river basins are impacted by introduced predator species.

Predatory species known to prey on arroyo toad adults, tadpoles, or eggs include green sunfish (*Lepomis cyanellus*), largemouth bass (*Micropterous salmoides*), black bullhead (*Ictalurus nebulosus*), prickly sculpin (*Cottus asper*), stocked rainbow trout (*Oncorhynchus mykiss*), oriental gobies (*Tridentiger* spp.), red shiners (*Notropis lutrensis*), American bullfrogs (*Lithobates catesbeiana*), African clawed frogs (*Xenopus laevis*), crayfish (*Procambarus clarkia*), and mammalian species including raccoons (*Procyon lotor*) and opossums (*Didelphis virginiana*) (Sweet 1992, pp. 118–122; Service 1999, pp. 17, 48). All of these species prey on arroyo toad tadpoles, and all but the crayfish, red shiners, and African clawed frogs were known to impact arroyo toads at the time of listing (59 FR 64859; December 16, 1994). Where nonnative predators occur, they can be widespread and occur in high abundances. For example, surveys along San Mateo Creek on the Cleveland National Forest confirmed a very high abundance and widespread distribution of nonnative aquatic species, with approximately 77 percent of the ''major'' pools and 45 percent of the ''minor'' pools occupied by at least one nonnative species (ECORP 2004, pp. 18, 25).

Bullfrogs and African clawed frogs are two of the primary introduced species that prey upon arroyo toads. Both species feed on arroyo toads at all life stages (Sweet 1992, p. 128; Ramirez 2007, p. 102). Sweet (1992, p. 132) found that bullfrogs, which target calling male arroyo toads, were associated with resulting sex ratio biases in arroyo toads of 1:14 (1 male to 14 females) in Sespe Creek. Of 40 bullfrogs captured along the Santa Margarita River in 2008, arroyo toad remains were found in the stomach contents of over half of them (Brehme *et al.* 2011, p. 44). USGS further estimated 125 arroyo toads were being consumed by bullfrogs per kilometer per month along the lower Santa Margarita River (Backin and Brehme, USGS, pers. comm. 2012). Additionally, over the past 20 years, at least 60 species of fishes have been introduced to the western United States, 59 percent of which are predatory. Arroyo toad tadpoles are subject to predation by many of these introduced fish species, especially green sunfish and prickly sculpin. Mosquitofish (*Gambusia affinis*) and crayfish have also been observed to prey on both tadpoles and eggs.

In recent years, wild pigs (*Sus scrofa*) have been recognized as a likely new stressor to arroyo toads, and are now found at 5 of 35 river basins. Arroyo toads are expected to be adversely affected in the San Diego River watershed as a result of wild pig introductions (SDNHM 2010, pp. 3, 23, 29, 32, 34–35). The mild climate of San Diego County can support rapid population growth and expansion of wild pig populations, making eradication of wild pigs unlikely and control difficult (CBI 2009, pp. 14, 20–21; SDNHM 2010, p. 42; Winchell, USFWS, pers. comm. 2012). Wild pigs negatively affect almost all aspects of ecosystem structure and function; for example, areas where pigs have rooted appear as if rototilled, leaving large areas of bare earth that can be easily colonized by invasive, nonnative weeds (Jolley *et al.* 2010, p. 519). Wild pigs may also directly consume arroyo toads, as they are opportunistic omnivores whose diet has been observed to include reptiles and amphibians (Barrett and Birmingham 1994, p. D–66; Wilcox and Van Vuren 2009, p. 114; Jolley *et al.* 2010, pp. 520–522).

Detrimental effects of arroyo toad predation have been demonstrated throughout the range of the species. Along the Santa Margarita River in MCB Camp Pendleton, occupancy models for wet arroyo toad habitat indicate that

nonnative aquatic predators had the largest negative impact on arroyo toad occupancy and detectability (Brehme *et al.* 2006, p. 43). This negative association weakened to a level of insignificance in 2009—which corresponded with elevated aquatic predator removal efforts—but returned again in 2010 along with a greater number of sites where nonnative predator fish and crayfish were detected (Brehme *et al.* 2011, pp. 29, 31, 35–36). Brehme *et al.* (2011, pp. 2–3) strongly recommend continued control of nonnative aquatic species, especially bullfrogs and crayfish, for continued persistence of arroyo toad in the lower Santa Margarita River. Once established, nonnative predators appear resilient and persist in the system except when drying creates a period of habitat unsuitability (Miller *et al.* 2012, pp. 2, 7). Thus, Brehme *et al.* (2011, p. 2) recommend modifying water releases along the lower Santa Margarita River to simulate a more natural hydrology pattern (i.e., no releases in summer months), along with continued, elevated control of nonnative aquatic species.

Some progress has been made since listing toward reducing the threat of introduced predators to arroyo toads and their habitat. Efforts are being made to remove or reduce nonnative animal populations in several areas, including the Santa Ynez River Basin on the Los Padres National Forest and in the Santa Clara River Basin on the Angeles National Forest. Forest Service personnel have also worked with animal control agencies to reduce the releases of raccoons and opossums in arroyo toad habitats. At MCB Camp Pendleton, pursuant to a biological opinion issued in 1995, the Base must take measures to assess threats to the survival and recovery of arroyo toad, including those from nonnative predators (Service 1995, pp. 1, 26, 32, 35). Measures to control nonnative predators are further described and incorporated in the most recent INRMP for MCB Camp Pendleton (MCB Camp Pendleton 2007, pp. C–1–C–19). Nonnative aquatic predator removal on Base has been ongoing for several years and has shown a benefit to arroyo toads in the Lower Santa Margarita River Basin.

In the San Juan Creek Basin in Orange County, a 6-year aquatic predator control program was conducted as mitigation for two California Department of Transportation (CalTrans) projects on adjacent State Route 74. The program was effective in reducing bullfrog adults and larvae from the headwaters of the creek and has slowed local proliferation of this species. Continuation of removal efforts is recommended within the creek and at downstream breeding populations that provide sources of dispersal into the study area (LSA and BonTerra 2012, pp. 12–13). However, the program ended in 2012. As another CalTrans project is anticipated along State Route 74, the work could be continued through this new project, but may not be initiated for another year or more. Actions such as these provide benefits only in the short term unless replaced with a long-term mechanism for continued predator control and/or eradication.

In order to address the impacts of feral pigs, the Cleveland National Forest prepared an environmental assessment of a proposed feral pig damage control project on the Forest, Bureau of Land Management lands, and on the Capitan Grande Indian Reservation (USDA 2012, p. 49). However, implementation of this project is uncertain. Securing funding and access to private lands where wild pigs might be found outside Federal lands are necessary in order to control this species, but are currently challenging (Winchell, USFWS, pers. comm. 2012).

Very limited information is available on the effects of introduced predators in Mexico. We are aware that introduced predators are present at all 10 river basins in Mexico that support arroyo toads (Lovich 2009, pp. 90–91); however, the magnitude of impacts on local populations is unknown.

Introduced predators are currently impacting arroyo toads at 28 out of the 35 river basins where the arroyo toad is known to occur. Where introduced predators occur, they have an extreme effect on arroyo toads and their habitats. Currently, 5 of the 28 river basins impacted by nonnative predators have conservation measures to mitigate the impacts of introduced predators. We find that introduced predators are the most important factor threatening the arroyo toad across its range. Introduced predators have a pervasive scope and an extreme threat severity, as introduced predators may cause reductions in population size or even extirpation of entire arroyo toad populations. Therefore, introduced predators are a threat with a very high impact on the toad and its habitat (Service 2013, pp. 64–69). However, despite this high level of impact, and the fact that bullfrogs and other predators have become well-established in arroyo toad habitat (Service 2013, p. 69), no populations have yet been extirpated.

Drought

At the time of listing, drought and the resultant deterioration of riparian habitats in Southern California was considered to be the most significant natural factor adversely affecting the arroyo toad. Though arroyo toads likely naturally evolved with periodic drought conditions, the 1994 listing rule concluded that drought conditions, when combined with alteration of natural flow regimes, had degraded riparian ecosystems and created extremely stressful conditions for most aquatic species; drought years are also known to result in low food supplies that can be detrimental to breeding arroyo toads (59 FR 64859, December 16, 1994). Today, 21 of the 25 occurrences in the United States are impacted by drought as exacerbated by altered flow regimes.

Drought conditions continue to impact both arroyo toad populations and the riparian habitat that supports them. As drought conditions increase, reduction in plant growth results in less available canopy cover and shade, which could increase predation rates on arroyo toads (Campbell *et al.* 1996, p. 12).

As stated in the 1994 listing rule, drought can also directly impact breeding arroyo toads. During drought conditions, plants produce fewer flowers for insects; fewer insects result in less available food for arroyo toads. A major concern regarding the effect of drought on arroyo toads is that female toads may not be able to find sufficient insect prey to build up enough fat storage for egg production in time to find a mate, resulting in no reproduction for that year (Sweet 1992, pp. 56, 172, and 190; Campbell *et al.* 1996, p. 11). In addition, if streams dry up too early in the breeding season, arroyo toad tadpoles may not have enough time to reach metamorphosis.

The habitat requirements and life history of the arroyo toad increases the impact of drought on the species. Most waterways occupied by arroyo toads are small and are ephemeral streams at high elevations. At lower elevations, impacts from drought on arroyo toad occurrences are exacerbated by alteration of hydrology from dams, water diversions, and groundwater extraction due to urbanization and agriculture (see discussion under the *Urban Development, Agriculture,* and *Operation of Dams and Water Diversions* sections above). The arroyo toad's lifespan averages 5 to 6 years; if drought persists longer than 6 years, entire populations could be extirpated for lack of water (Sweet 1992, p. 147; Backlin and Brehme, USGS, pers. comm. 2012). For example, arroyo toad occurrences in ephemeral streams on MCB Camp Pendleton (San Mateo Creek, San Onofre Creek basins) and

Remote Training Site Warner Springs (Upper San Luis Rey River Basin) are at increased risk of extirpation from a prolonged drought and may be more dependent upon dispersal from more stable sites for recolonization (Brehme *et al.* 2006, pp. 43–44; Clark *et al.* 2011, p. 18).

At this time (March, 2014), the U.S. Drought Monitor shows that the worst drought category, ''exceptional drought,'' covers 9 percent of California and ''extreme drought'' (the second worst category) has increased to cover 67 percent of California (U.S. Drought Monitor 2014). According to the drought map (U.S. Drought Monitor 2014), most of the known arroyo toad occurrences in California are within drainages affected by the current drought. Therefore, we estimate that arroyo toad occurrences in 21 out of the 25 river basins in the United States are being affected by drought as exacerbated by altered hydrology. We do not have any information on how or if drought impacts river basins that support arroyo toads in Mexico but we expect that at least some of the river basins would be affected by regional droughts in similar fashion as the river basins in the United States, particularly at the one occurrence in Mexico that has a dam that alters natural flow regimes. Drought is certainly not unique in southern California and arroyo toad populations have withstood such episodes in the past, such that we are not aware of any occurrences that have become extirpated since listing due to drought conditions. However, the continued operation of dams and other water diversions adds stress to arroyo toad populations in ephemeral streams. Because the scope of the impacts from droughts are large (affecting 21 of the 25 river basins in the United States, and likely additional river basins in Mexico), and because drought has a serious level of severity on arroyo toad population and habitat, we find that drought conditions are a threat that results in a high level of impact to arroyo toad populations throughout their range (Service 2013, pp. 32–37).

Periodic Fire and Fire Suppression

In recent decades, large fires in the West have become more frequent, more widespread, and potentially more deadly to wildlife (Joint Fire Science Program 2007). At the time of listing, periodic fires were considered a threat to the arroyo toad and its habitat. In 1991, the Lions Fire on upper Sespe Creek in the Los Padres National Forest directly destroyed riparian habitat along Sespe Creek in the Santa Clara River Basin, which contained the largest known extant population of arroyo toads. The fire also destroyed 15 known breeding pools and over 50 percent of the known adult population on the Sespe drainage; however, by 1993, the population and its habitat had largely recovered due to recruitment from healthy populations of arroyo toads downstream (Sweet 1993, p. 19). Today, a robust population continues to persist in upper Sespe Creek. Currently, 22 of the 25 river basins in the United States are affected by fire suppression and periodic fire (Service 2013, p. 74), particularly as the natural fire regimes in Southern California have altered in frequency and intensity in recent decades. The remaining three river basins in the United States are not in habitats characterized as at high risk from altered fire regimes.

Periodic fires are considered a threat to the arroyo toads because fires can cause direct mortality of arroyo toads, destroy streamside vegetation, or eliminate vegetation that sustains the watershed. Pilliod *et al.* (2003, p. 176) state that the effects of fire may be greatest for amphibians that are habitat specialists, such as arroyo toads, compared to species that occupy different types of habitat and tolerate a wide range of environmental conditions. Other effects from fires include increased water temperature (as a result of canopy loss), toxic effects of smoke and fire retardant to water chemistry, increased sedimentation in streams and ponds that negatively impact reproduction and recruitment, and the effects of fire and post-fire conditions on arroyo toad terrestrial movements (Pilliod *et al.* 2003, pp. 163–181). In addition, wildfires often generate a substantial increase in erosion following the loss of protective ground cover and root anchors (Service 2003, p. 8). Although arroyo toads may recolonize areas impacted by fire (as occurred in upper Sespe Creek), recruitment from downstream occurrences is likely not possible in all locations due to habitat alteration from urbanization, existing dams, and other impacts.

Since the time the arroyo toad was listed in 1994, we now recognize that arroyo toads may also be impacted by fire suppression and firefighting activities, including fire line construction, hand line construction, bulldozing, water withdrawal using helicopters and pumps, backfiring, and fire camp and safety zone construction. After the 2007 Zaca Fire in Los Padres National Forest, a number of broad fuelbreaks and safety zones were bulldozed in several areas, including the lower portions of Mono and Indian Creeks (Sweet 2007a, pp. 1–9; 2007b, p. 1). At that time of year, a large proportion of the population would have been within burrows on the terraces, and any toads that were in burrows were very likely killed by bulldozing (Sweet 2007a, p. 1). Sweet (2007a, p. 1) also reported that the bulldozing operations also severely degraded upland habitat; for example, bulldozing created large piles of woody debris between the creek bed and the terraces that created substantial barriers to arroyo toad movement.

Periodic fire and fire suppression activities could potentially impact the arroyo toad through permanent loss of breeding habitat; permanent loss of upland habitat; and mortality, injury, or displacement of individuals. Currently, fire could impact 22 out of the 25 river basins in the United States where the arroyo toad is known to occur. Although we expect that fire could also impact river basins that support arroyo toads in Mexico, we currently lack information on habitat types and fire regimes in those areas.

Despite the potentially high level of impacts that fire and fire suppression can have on the species, very few fires have occurred in arroyo toad habitat since the time of listing, and we expect the incidence of fires will remain relatively constant. Fire and fire suppression activities have a large scope (affecting 22 of the 25 river basins in the United States) and a moderate severity, as fire could permanently or temporarily alter breeding habitat and cause mortality of arroyo toads. Therefore, we find that fire and fire suppression activities are a threat with a medium level of impact on the arroyo toad (Service 2013, pp. 72–37).

Climate Change

At the time of listing, the potential impacts of climate change to the arroyo toad and its habitat were not assessed. In the 2009 5-year review, we recognized that climate change could impact arroyo toad habitat; however, we lacked downscaled projections to make predictions on how a changing climate could impact arroyo toad habitat. Today, more information on downscaled climate projections has become available, and we conclude that effects of climate change could impact all 35 river basins that support arroyo toads and their habitat.

The term ''climate change'' refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, usually decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007a, p. 78).

Various types of changes in climate can have direct or indirect effects on species, including the arroyo toad. Specific effects of climate change on the arroyo toad and its habitat depend on the magnitude of future changes.

Predictions for changes in temperature vary across the range of the arroyo toad. Downscaled projections of temperature were available for the 25 river basins in the United States that support arroyo toads. In the Central Western California Ecoregion, which contains four river basins in the northern portion of the arroyo toad's range, mean annual temperatures are predicted to increase from 1.6 to 1.9 °C (2.9 to 3.4 °F) by 2070 (PRBO 2011, pp. 35, 40). In the Southwestern California Ecoregion, which contains 21 river basins, temperatures are predicted to rise 1.7 to 2.2 °C (3.1 to 4.0 °F) (PRBO 2011, pp. 35, 40). High temperature events are expected to become more common in both ecoregions, and taxa with very narrow temperature tolerance levels may experience thermal stress to the point of direct mortality or diminished reproduction in the Southwestern California Ecoregion (PRBO 2011, pp. 38, 42).

There is a general lack of consensus of the effects of future climate change on precipitation patterns in both ecoregions. Some models suggest almost no change, whereas others project decreases of up to 32 percent in the Central Western California Ecoregion and 37 percent in the Southwestern California Ecoregion by 2070 (PRBO 2011, pp. 35, 40). Qualitative indicators of changes in concentrated near-surface water vapor (atmospheric rivers) above the Pacific Ocean in current projections suggest flood risks in California from warm-wet storms may increase beyond those known historically, mostly in the form of occasional more-extreme-than-historical storm seasons (Dettinger 2011, p. 522).

Changes in climate may impact the historical flow regimes that support arroyo toads. Snyder *et al.* (2004, pp. 594, 600) has projected that annual snow accumulation will decrease significantly for all hydrologic regions in California. Reduced snowpack will lead to reduced stream-flows, especially in the spring (EPA 2012). Additionally, rising temperatures cause snow to begin melting earlier in the year, which alters the timing of stream-flow in rivers that have their sources in mountainous areas (EPA 2013). Thus, taxa that rely on runoff from snowmelt will find streams and rivers drying up much earlier than before, and temperatures of the water are likely to increase due to a reduction in snowmelt contribution, likely altering riparian communities downstream (Snyder *et al.* 2004, p. 600; PRBO 2011, p. 42).

Additional impacts from climate change on arroyo toad habitat include reductions in groundwater systems and overall water supply. Surficial aquifers, which supply much of the flow to streams, lakes, wetlands, and springs, are likely to be the part of the groundwater system most sensitive to climate change (Alley *et al.* 1999, p. 21). Increased competition for water resources in the southwestern United States and Mexico are expected due to projected temperature increases, river-flow reductions, dwindling reservoirs, decreased groundwater recharge, and rapid population growth (EPA 2012). For example, the California Energy Commission (CEC) (2009, p. 22) predicts the combined effects of climate change, water use practices, and regional growth will expose San Diego County to greater risk of water shortfalls before 2050.

Aspects of arroyo toad life history and biology make them sensitive to potential climate-change-related impacts. Arroyo toads have a relative inability to disperse longer distances in order to occupy more favorable habitat conditions (*i.e.,* move up and down stream corridors, or across river basins). This reduced adaptive capacity for arroyo toad is a function of its highly specialized habitat requirements, the dynamic nature of its habitat, natural barriers such as steep topography at higher elevations, and extensive fragmentation (unnatural barriers) within and between river basins from reservoirs, urbanization, agriculture, roads, and the introduction of nonnative plants and predators. Climate change also could affect the distribution of pathogens and their vectors, exposing arroyo toads (potentially with weakened immune systems as a result of other environmental stressors) to new pathogens (Blaustein *et al.* 2001, p. 1808). Climate change may result in a range shift of the fungus *Batrachochytrium dendrobatidis* (Bd), (Pounds *et al.* 2006, p. 161; Bosch *et al.* 2007, p. 253), a virulent amphibian disease. Though Bd has the potential to infect and kill arroyo toads (Nichols 2003, entire), it is not currently found within the range of the arroyo toad and, therefore, is not expected to affect arroyo toads in the near future, though it remains a potential future threat. More information on the potential impact of Bd on arroyo toads is available in the ''Disease'' section of the Species Report (Service 2013, pp. 62–64).

We conclude that because climate change is likely to impact all river basins where the arroyo toad is known to occur in the future, it has a pervasive scope. We also conclude that climate change has a serious severity, as it has the potential to degrade habitat and reduce populations over a large proportion of the range of the arroyo toad. Therefore, we expect that climate change will have a high level of impact on the arroyo toad and its habitat throughout its range. See additional discussion in the ''Climate Change'' section of the Species Report (Service 2013, pp. 75–80).

Combination of Threats

Combinations of threats working in concert with one another have the ability to negatively impact species to a greater degree than individual threats operating alone. Multiple stressors can alter the effects of other stressors or act synergistically to affect individuals and populations (IPCC 2002, p. 22; Boone *et al.* 2003, pp. 138–143; Westerman *et al.* 2003, pp. 90–91; Opdam and Wascher 2004, pp. 285–297; Boone *et al.* 2007, pp. 293–297; Vredenburg and Wake 2007, p. 7; Lawler *et al.* 2010, p. 47; Miller *et al.* 2011, pp. 2360–2361).

Alterations in habitat caused by dam operation, urban development, and invasive plants interact with nonnative predators by increasing the suitability of habitat for nonnative predators. Artificially sustained flow regimes from urban runoff, agricultural runoff, or dam operation create ponds that make habitat more suitable for bullfrogs and African clawed frogs than for arroyo toads (Sweet 1992, p. 156; Riley *et al.* 2005, p. 1905). Bullfrogs are well-adapted to deep-water conditions in ponded areas above dams, and dam releases can introduce them to downstream habitats (CDFG 2005, p. 178). In these modified systems with deep pools that persist year-round, both bullfrogs and arroyo toads must rely on the same habitat for breeding, even though their biological needs differ. This situation allows bullfrogs more opportunity to prey on all of the life stages of arroyo toads. Furthermore, the introduction of nonnative plant species may enhance the probability of successful introduction of other nonnative species. For example, there is some evidence that the survival of bullfrogs is enhanced by the presence of nonnative aquatic vegetation, which provides habitat more suitable to bullfrogs (Maxell and Hokit 1999, p. 2.8).

Invasive, nonnative plants can interact with fire to exacerbate its effects on riparian habitats and natural stream flow. Large riparian corridors have historically acted as natural firebreaks

in southern California because of their low-lying topography and relative absence of flammable fuels. However, recent studies suggest that invasive plants are making riparian systems more fire-prone (Lambert *et al.* 2010). Giant reed and tamarisk are highly flammable, yet both species recover rapidly from fire by vigorous regrowth from below-ground plant parts. By contrast, cottonwoods, willows, and other native woody plants are much less tolerant of direct exposure to fire. Coffman *et al.* (2010, pp. 2723–2734) examined the regrowth rates of giant reed and nearby native woody vegetation following a 741-acre (300-ha) fire in the Santa Clara River watershed in 2005. Giant reed grew three to four times faster following the fire, and within 11 years, its density was 20 times greater than native species. This suggests that rapid regrowth of the highly flammable biomass creates an invasive plant-fire cycle that ultimately leads to a decline in native species in the ecosystem (Coffman *et al.* 2010, pp. 2730–2731).

Overall reductions in available habitat and population size through all the threats described in this document could cause further fragmentation of remaining arroyo toad populations. In particular, fragmentation can cause a ''habitat split,'' which is a separation between the two habitats critical for amphibian reproduction (Dixo *et al.* 2009, p. 1567). Habitat split may have an even larger effect on amphibian species with aquatic larval development and a terrestrial adult stage, such as the arroyo toad. Because of its dual habitat needs, the arroyo toad would be particularly susceptible to fragmentation that isolates breeding wetlands from upland areas that are the preferred habitats of adults. A number of studies have reported changes in genetic diversity associated with habitat fragmentation in amphibians (Young *et al.* 1996; Cushman 2006; Dixo *et al.* 2009). Genetic consequences of fragmentation center on a significant decrease in genetic diversity from (1) relatively low dispersal capabilities; (2) mortality when moving across roads and unsuitable habitats, which depresses growth rates; (3) narrow habitat tolerances; and (4) high vulnerability to pathogens, invasive species, climate change, and environmental pollutants (Cushman 2006, p. 232), ultimately leading to decreased survival or reproductive success.

Both dispersal ability and habitat availability determine how vulnerable arroyo toads are to reduced genetic diversity due to fragmentation. A study by Dixo *et al.* (2009, p. 1561) found that while a generalist species of amphibian (*Rhinella ornata*) was relatively tolerant of larger habitat fragments and maintained genetic diversity within them, gene flow in populations was negatively impacted in small patches of remaining habitat. This result implies that more specialized species like the arroyo toad would suffer even more severe genetic consequences from a fragmented and isolated landscape. In fact, arroyo toads have narrow environmental tolerances (highly specialized breeding, foraging, and shelter requirements), generally low dispersal abilities (Service 2013, pp. 6–7), and are vulnerable to being killed when burrowing into or crossing roads at night, all characteristics that exacerbate the negative effects of fragmentation, habitat loss, and habitat degradation. Combined with the small population sizes of arroyo toad occurrences, the species could find it difficult to persist while sustaining the impacts of urban, suburban, and rural development that have already resulted in severe arroyo toad habitat loss and fragmentation.

Effects of climate change may exacerbate other threats to the arroyo toad by increasing the frequency or severity of droughts which could result in increases in groundwater pumping and water diversion for urban and agriculture use, increasing runoff and erosion during extreme flood events, increasing the frequency or intensity of wildfire, and increasing the spread and virulence of pathogens.

Based on the best available scientific and commercial information, we find that the cumulative and combined effects of multiple factors acting on the arroyo toad are pervasive in scope, as they affect all arroyo toad occurrences, and are of serious severity, as these impacts could cause the loss or degradation of habitat and potential reductions in arroyo toad populations. Therefore, we conclude that combined effects of multiple factors pose a high level of threat to the arroyo toad and its habitat (Service 2013, pp. 84–85).

Recovery and Recovery Plan Implementation

Section 4(f) of the Act directs us to develop and implement recovery plans for the conservation and survival of endangered and threatened species unless we determine that such a plan will not promote the conservation of the species. Under section 4(f)(1)(B)(ii), recovery plans must, to the maximum extent practicable, include: ''Objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of [section 4 of the Act], that the species be removed from the list.'' However, revisions to the list (adding, removing, or reclassifying a species) must reflect determinations made in accordance with sections 4(a)(1) and 4(b) of the Act. Section 4(a)(1) requires that the Secretary determine whether a species is endangered or threatened (or not) because of one or more of five threat factors. Section 4(b) of the Act requires that the determination be made ''solely on the basis of the best scientific and commercial data available.'' Therefore, recovery criteria should help indicate when we would anticipate an analysis of the five threat factors under section 4(a)(1) would result in a determination that a species is no longer an endangered species or threatened species because of any of the five statutory factors.

Thus, while recovery plans provide important guidance to the Service, States, and other partners on methods of minimizing threats to listed species and measurable objectives against which to measure progress towards recovery, they are not regulatory documents and cannot substitute for the determinations and promulgation of regulations required under section 4(a)(1) of the Act. A decision to revise the status of or remove a species from the Federal List of Endangered and Threatened Wildlife (50 CFR 17.11) is ultimately based on an analysis of the best scientific and commercial data then available to determine whether a species is no longer an endangered species or a threatened species, regardless of whether that information differs from the recovery plan.

The Service finalized a recovery plan for the arroyo toad in 1999 (Service 1999, pp. 1–119). The intent of the arroyo toad recovery plan was to prescribe recovery criteria that would demonstrate population stability and good habitat management over a period of years, which would indicate a substantially improved situation for arroyo toads. We anticipated later developing better information on the status and needs of arroyo toads, based on the surveys, research, and monitoring prescribed in the plan. Because the recovery plan incorporated an adaptive management approach to recovery, new information would be used to modify the recovery tasks and criteria, as appropriate (Service 1999, p. 108).

The overall objectives of the recovery plan are to prevent further loss of individuals, populations, and habitat critical for the survival of the species; and to recover existing populations to normal reproductive capacity to ensure viability in the long term, prevent

extinction, maintain genetic viability, and improve conservation status (Service 1999, p. 108). The general goal to achieve recovery of the species is to establish sufficient self-sustaining populations. The recovery plan describes 22 river basins in the coastal and desert areas of 9 counties along the central and southern coast of California, and the recovery plan divides the range of the arroyo toad into three large recovery units—Northern, Southern, and Desert. These recovery units were established to reflect the ecological and geographic distribution of the species and its current and historic range (Service 1999, pp. 71–72); we have since received updated information on the number and extent of river basins that support arroyo toads. The Recovery Plan did not address any occurrences in Baja California, Mexico, as very limited information on the species was available when the plan was drafted.

The Recovery Plan provides two criteria for determining when the arroyo toad should be considered for reclassification from endangered to threatened status: (1) That management plans have been approved and implemented on federally managed lands to provide for securing the genetic and phenotypic variation of the arroyo toad in each recovery unit by conserving, maintaining, and restoring the riparian and upland habitats used by arroyo toads for breeding, foraging, and wintering habitat; and (2) that at least 20 self-sustaining metapopulations or populations must be maintained at specific locations (Service 1999, pp. 75–76). The Recovery Plan states that self-sustaining metapopulations or populations are those documented as having successful recruitment (i.e., inclusion of newly matured individuals into the breeding population) equal to 20 percent or more of the average number of breeding adults in 7 of 10 years of average to above average rainfall amounts with normal rainfall patterns. Such recruitment would be documented by statistically valid trend data indicating stable or increasing populations. In addition, self-sustaining populations require no direct human assistance (such as captive breeding or rearing, or translocation of toads between sites). This does not include activities such as patrolling or closing of roads, campgrounds, or recreational areas, or maintaining stream crossings or fencing (Service 2013, p. 76).

The Recovery Plan also states that arroyo toad should be considered for delisting when the genetic and phenotypic variation of the arroyo toad throughout its range in California is secured by maintaining 15 additional self-sustaining populations of arroyo toads in coastal plain, coastal slope, desert slope, and desert river basins, including known populations outside of Federal jurisdiction (Service 1999, p. 76).

In our analysis of the status of the arroyo toad in the Species Report, we reviewed the 22 river basin occurrences that were identified at the time of listing (59 FR 64859; Service 1999, pp. 12–31). Of these 22 occurrences, 4 occurrences (Whitewater River, San Felipe Creek, Vallecitos Creek, and Pinto Wash basins) were determined to be reported erroneously, as examination of locality records, museum specimens, photographs and other records, as well as new visits to these river basins found no evidence that they had ever supported arroyo toads (Ervin *et al.* 2013, pp. 197—204). Additionally, the status of arroyo toads was unknown in 2 river basins (Santa Ana River and Otay River) identified for recovery actions in the recovery plan (Service 1999, pp. 23–24, 30).

The arroyo toad is currently extant or presumed to be extant at 16 occurrences on federal lands, including those known at listing, while the status of the Otay River Basin and Lower Santa Ana River Basin occurrences is still unknown (Service 2013, Table 1). However, arroyo toads were redetected in the San Jacinto River Basin, which was previously identified as part of the greater Santa Ana River Basin in the recovery plan (Service 1999, pp. 23–24); the split of the Greater Santa Ana River Basin into two occurrences adds an additional occurrence to those recognized in the recovery plan. Thus, at least one population within each of these 17 river basins supporting the arroyo toad identified at listing is currently extant or presumed to be extant on Federal land. Furthermore, the arroyo toad is extant at 5 additional river basins with no populations on Federal land. Updated information indicates some locations where erroneously reported, while the arroyo toad has been identified in three additional river basins. The arroyo toad continues to occur at 22 occurrences. While some of these locations differ from those identified in the downlisting criteria, the number of populations exceeds that identified to meet downlisting criteria in the recovery plan. Finally, management plans have been approved and are being implemented to help conserve, maintain, and restore habitat on Federal lands (Service 2013, pp. 87–94).

As stated above, the recovery plan also identifies the need for populations or metapopulations to be self-sustaining. We do not have statistically valid trend data of arroyo toad occurrences that would allow us to project whether populations are declining, stable, or increasing as described in the Recovery Plan. We will instead consider, based on the best available scientific and commercial data, whether available information indicates arroyo toads are self-sustaining. Available survey data does report that arroyo toads remain extant or presumed extant at 28 of the 35 occurrences rangewide, and have continued to reproduce and survive throughout their range without direct human assistance as described in the Recovery Plan. After reviewing recent survey data, we have found that, while threats identified at listing are ongoing, arroyo toads remain extant or presumed extant at all of the occurrences occupied at listing. The best available information indicates that these populations have become self-sustaining in part due to the management plans that are being implemented to address some of the impacts of 9 of the 12 current threats (excluding fire, drought, and climate change); these plans are managed through coordinated efforts with our partners. The majority of waterways that support arroyo toads occur on Federal land where efforts are in progress to minimize impacts to listed species. Each of the National Forests have land management plans that include measures to minimize impacts to listed species. MCB Camp Pendleton and Fort Hunter Ligget Military Reservation have developed INRMPs that include conservation measures that benefit the arroyo toad. Five HCPs have also been completed and provide protection to covered species, including arroyo toad. These plans help to minimize some of the impacts from currently identified threats for continued conservation of this taxon.

Furthermore, we are not aware of any river basins that have been confirmed as completely extirpated (no arroyo toads at any rivers or streams within the river basin) since listing. Therefore, absent the survey data required to fulfill the definition of self-sustaining in the 1999 Recovery Plan, we conclude that these factors are indicative of self-sustaining populations.

As stated above, the intent of the recovery plan was to prescribe recovery criteria that would at least demonstrate population stability and good habitat management over a period of years, which would indicate a substantially improved situation for arroyo toads. Despite the important progress made toward meeting the reclassification criteria outlined in the 1999 recovery plan, we recognize that we have not met the exact number of occupied river

basins identified in the plan. New information indicates that four of the river basins identified in the recovery plan were never occupied by arroyo toad, and there are eight river basins in the United States where no management plans have been approved or implemented on federally managed lands, in part because several of those basins do not contain a large amount of federally owned land. There are 17 river basins where management plans have been approved and implemented on federally managed land. At all those 17 occurrences, at least one population within the river basin has remained extant since the time of listing despite the threats still impacting arroyo toads and their habitat. Additionally, 5 occurrences on non-Federal lands have been acquired or conserved through other mechanisms, such as HCPs. We therefore conclude that we have met the overall intent of the downlisting criteria for the arroyo toad for the number of self-sustaining populations required for downlisting, in that these river basins demonstrate population stability and good habitat management over multiple years.

We also conclude that the arroyo toad has not met the delisting criteria, either by intent or by the letter of the plan, as we are only aware of management plans on non-Federal land at eight river basins, many of which overlap with the river basins that have management plans on Federal lands. Therefore, we have not achieved the delisting criteria of 15 additional self-sustaining arroyo toad populations outside of Federal jurisdiction. Further detail on our analysis of river basins and the recovery criteria is described in the Species Report (Service 2013, pp. 88–95).

Finding

An assessment of the need for a species' protection under the Act is based on whether a species is in danger of extinction or likely to become so because of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. As required by section 4(a)(1) of the Act, we conducted a review of the status of the arroyo toad and assessed the five factors to evaluate whether the arroyo toad is endangered or threatened throughout all of its range. We examined the best scientific and commercial information available regarding the past, present, and future threats faced by the species. We reviewed information presented in the 2011 petition, information available in our files and gathered through our 90-day finding in response to this petition, and other available published and unpublished information. We also consulted with species experts and land management staff with the Forest Service, CDFW, the California Department of Parks and Recreation (CDPR), and HCP permittees who are actively managing for the conservation of the arroyo toad.

In considering what factors might constitute threats, we must look beyond the mere exposure of the species to the factor to determine whether the exposure causes actual impacts to the species. If there is exposure to a factor, but no response, or only a positive response, that factor is not a threat. If there is exposure and the species responds negatively, the factor may be a threat and we then attempt to determine how significant the threat is. If the threat is significant, it may drive, or contribute to, the risk of extinction of the species such that the species warrants listing as endangered or threatened as those terms are defined by the Act. This does not necessarily require empirical proof of a threat. The combination of exposure and some corroborating evidence of how the species is likely impacted could suffice. The mere identification of factors that could impact a species negatively is not sufficient to compel a finding that listing is appropriate; we require evidence that these factors are operative threats that act on the species to the point that the species meets the definition of endangered or threatened under the Act.

Since the arroyo toad was listed in 1994, new threats have been identified: invasive, nonnative plants (Factors A and E) and climate change (Factors A and E). However, some factors known to pose a threat to the arroyo toad and its habitat at the time of listing are no longer of concern (for example, new dam construction or collection for scientific or commercial purposes). Conservation activities and preservation of habitat have further reduced threats from mining and prospecting (Factors A and E), livestock grazing (Factors A and E), roads and road maintenance (Factors A and E), and recreation (Factors A and E).

Overall, a large number of stressors continue to impact the arroyo toad. We find that urban development, operations of dams and water diversions, climate change, and drought continue to pose a high level of threat to the continued existence of the arroyo toad (affecting many or most occurrences, likely to seriously degrade habitat or reduce species occurrences), and introduced predators pose a very high level of threat to the arroyo toad (affecting most occurrences and likely to destroy habitat or eliminate species occurrences).

We also find that fire and fire suppression, invasive plants, recreation, roads and road maintenance and agriculture pose a moderate level of threat to the arroyo toad. These threats are of lower severity and are less widespread than the high and very high-level threats. Livestock and mining and prospecting continue to pose a threat to the arroyo toad; however, these threats pose a low level of impact to the arroyo toad and its habitat, meaning they affect a limited number of occurrences and moderately or slightly degrade habitat or reduce occurrences.

Though some conservation measures have been put in place to decrease the current impacts of urban development, operation of dams, and introduced predators, some threats present ongoing challenges. For example, management of introduced predators has been difficult to implement once predators are established and requires ongoing eradication and management efforts. Drought and climate change are not easily amenable to management through existing regulatory or conservation actions, although their impacts can be reduced through improved management and reduction of other stressors. The combination of factors, such as the interaction between altered flow regimes caused by urban development and operation of dams and water diversions with the invasive potential of nonnative plants and introduced predators, can also increase the magnitude of the individual threats.

As stated above, many of the threats currently impacting the arroyo toad were also known at the time of listing. However, we also recognize that both the magnitude and the type of some threats impacting the arroyo toad have changed since the time of listing. In the case of urban development, agriculture, and operations of dams and water diversions, conservation actions and consultation through section 7 of the Act have decreased the severity of these threats since the time of listing, such that these threats cause alteration or degradation of habitat rather than the direct and permanent removal of habitat that was a concern at the time of listing. Conservation measures have overall decreased the impact of multiple other threats facing the arroyo toad, including invasive plants, introduced predator species, road and road maintenance,

recreation, and livestock grazing. Conservation efforts are being implemented on Federal lands in portions of 17 river basins supporting arroyo toad through the land management plans for each of the four southern California National Forests (Los Padres, Angeles, San Bernardino, and Cleveland), and through the INRMPs on MCB Camp Pendleton and Fort Hunter Liggett. In Mexico, 4 of 10 river basins are within or partially within a national park. Arroyo toads have remained extant or are presumed extant within the range they occupied at the time of listing. Furthermore, the known range of the species had been expanded with discovery of the Fort Hunter Liggett population in Monterey County.

We examined the downlisting criteria provided in the recovery plan for the arroyo toad (Service 1999). The downlisting recovery criteria state that for the arroyo toad to be reclassified to threatened, management plans must have been approved and implemented on federally managed lands, and at least 20 self-sustaining metapopulations or populations at specified locations on Federal lands must be maintained. Since the time of listing, we have found some of those populations were identified in error, as the river basins were never occupied by arroyo toads. Furthermore, current available information indicates that arroyo toads are persisting or are presumed to be persisting on Federal lands in 17 river basin occurrences and 5 additional occurrences on non-Federal lands, for a total of 22 extant or presumed extant occurrences in California. Portions of these occurrences are afforded protections from habitat destruction and from some effects of habitat alteration through current land management plans, INRMPs, and HCPs, and arroyo toads have persisted throughout their geographic range since listing, supporting that the occurrences are self-sustaining. Therefore, we find that the arroyo toad has met the intent of the criteria identified in the recovery plan for downlisting.

In conclusion, we have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species. After review of the information pertaining to the five statutory factors, we find that the ongoing threats are not of sufficient imminence, intensity, or magnitude to indicate that arroyo toad is presently in danger of extinction throughout all its range. Although threats to the arroyo toad still exist and will continue into the foreseeable future, the Service, Forest Service, CDFW, CDPR, and HCP permittees are implementing conservation measures or regulatory actions to reduce the level of impact on the arroyo toad, and overall the magnitude of threats has decreased since the time of listing. We also find that the intent of the reclassification criteria in the recovery plan has been met. We therefore find the arroyo toad to be threatened throughout all its range.

Significant Portion of the Range

Having examined the status of the arroyo toad throughout all its range, we next examine whether the species is in danger of extinction in a significant portion of its range. The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose in analyzing portions of the range that have no reasonable potential to be significant or in analyzing portions of the range in which there is no reasonable potential for the species to be endangered or threatened. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that: (1) The portions may be ''significant'' *and* (2) the species may be in danger of extinction there or likely to become so within the foreseeable future. Depending on the biology of the species, its range, and the threats it faces, it might be more efficient for us to address the significance question first or the status question first. Thus, if we determine that a portion of the range is not ''significant,'' we do not need to determine whether the species is endangered or threatened there; if we determine that the species is not endangered or threatened in a portion of its range, we do not need to determine if that portion is ''significant.'' In practice, a key part of the determination that a species is in danger of extinction in a significant portion of its range is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats to the species occurs only in portions of the species' range that clearly would not meet the biologically based definition of ''significant,'' such portions will not warrant further consideration.

We consider the ''range'' of the arroyo toad to be from Fort Hunter Liggett in Monterey County, California, United States, to northwestern Baja California, Mexico. We are, therefore, proposing to revise the entry for the arroyo toad in the List of Endangered and Threatened Wildlife at 50 CFR 17.11(h) to reflect that the historical range in Mexico specifically pertains to Baja California and not the rest of the country. The historical range data in the List is non-regulatory in nature and is provided as information for the reader; this change therefore does not alter or limit application of the prohibitions of the Act or its implementation (50 CFR 17.11(d) and (e)). We consider a total of 28 river basins within this range to contain extant populations of arroyo toads. Since the toad was listed, several new populations have been found as a result of increased search efforts in Riverside County and Baja California; however, these areas were all within the historical range occupied by the species (WRCRCA 2006, p. 5; Lovich 2009, pp. 74–97). Since its listing, an arroyo toad population was discovered in the San Antonio River Basin at Fort Hunter Ligget, resulting in a northward expansion of the known range (by 93 mi (150 km)). However, this area was likely always part of the historical range of the species.

Habitat loss and other anthropogenic (human-caused) factors have resulted in the arroyo toad now being absent from several localities where it historically occurred. Jennings and Hayes (1994, p. 57) estimated that arroyo toads had been eliminated from 76 percent of their historical range prior to the time of listing. However, subsequent discoveries of new localities and remnant populations reduce this estimate to 65 percent (Lanoo 2005, p. 4). These disappearances from specific localities have created artificial gaps in the species' geographic range and resulted in a fragmented and patchy distribution. However, despite these gaps, arroyo toads remain extant in scattered populations throughout their historical range (Service 2013, Map 1). Overall, arroyo toads have not been extirpated from any of the 16 river basins known to be occupied at the time of listing (Service 2013, p. 94, Table 1).

Given the patchy distribution of arroyo toads throughout their range, no individual area is likely to be of greater biological or conservation importance than any other area. Additionally, river basins containing arroyo toad occurrences that are extant or presumed to be extant span the entire extent of the species' historical range. As such, we conclude that no major portion of the species' range has been lost, and that the lost historical range is not a significant portion of the arroyo toad's range.

We evaluated the current range of the arroyo toad to determine if potential threats to the species have any apparent geographic concentration. We examined

threats from urban development (Factors A and E), agriculture (Factors A and E), operation of dams and water diversions (Factors A and E), mining and prospecting (Factors A and E), livestock grazing (Factors A and E), roads and road maintenance (Factors A and E), recreation (Factors A and E), invasive, nonnative plants (Factors A and E), introduced predator species (Factor C), drought (Factors A and E), fire and fire suppression (Factors A and E), and climate change (Factors A and E). While the range of the arroyo toad could be divided by recovery units or by occurrences in the United States and occurrences in Mexico, we conclude that all occurrences are experiencing similar levels of threats. As discussed above, although the specific threats affecting the species may be different at individual sites or in different parts of the arroyo toad's range, on the whole threats are occurring throughout the species' range. While the types of threats affecting arroyo toads differ among occurrences, all are experiencing a similar level or intensity of threat and no portion is experiencing a greater level of risk than other portions; see the *Geographic Breakdown of Threats* section of the Species Report for more detail on threats in each Recovery Unit (Service 2013, pp. 86–88). In no portions of its range are threats significantly concentrated or substantially greater than in other portions of its range. Therefore, no portion of the arroyo toad's range warrants further consideration.

Conclusion

Based on the analyses above, we conclude that the arroyo toad is no longer in danger of extinction throughout all or a significant portion of its range, but instead is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. While no populations of the arroyo toad are at imminent risk of extirpation, ongoing threats continue to affect the likelihood of long-term persistence of the populations and the species such that the arroyo toad more appropriately meets the definition of a threatened species under the Act. Therefore, we find that the petitioned action is warranted, and we propose to reclassify the arroyo toad from an endangered species to a threatened species.

Effects of This Rule

If this proposed rule is made final, it would revise 50 CFR 17.11(h) to reclassify the arroyo toad from endangered to threatened on the List of Endangered and Threatened Wildlife. However, this reclassification does not significantly change the protections afforded this species under the Act. The statutory and regulatory protections provided pursuant to sections 9 and 7 of the Act remain in place. Anyone taking, attempting to take, or otherwise possessing an arroyo toad, or parts thereof, in violation of section 9 of the Act is subject to a penalty under section 11 of the Act, unless their action is covered under a special rule under section 4(d) of the Act. However, no 4(d) rules are proposed for the arroyo toad. Pursuant to section 7 of the Act, all Federal agencies must ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of the arroyo toad. This rule would not affect the critical habitat designation for the arroyo toad at 50 CFR 17.95(d).

Recovery actions directed at the arroyo toad will continue to be implemented as outlined in the Recovery Plan for this species (Service 1999, entire).

Required Determinations

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(a) Be logically organized;

(b) Use the active voice to address readers directly;

(c) Use clear language rather than jargon;

(d) Be divided into short sections and sentences; and

(e) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES** section. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the names of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

National Environmental Policy Act

We determined we do not need to prepare an Environmental Assessment or an Environmental Impact Statement, as defined under the authority of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), in connection with regulations adopted pursuant to section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of all references cited in this proposed rule is available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2014–0007 or upon request from the Field Supervisor, Ventura Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT** section).

Author

The primary author of this proposed rule is the Pacific Southwest Regional Office in Sacramento, California, in coordination with the Ventura Fish and Wildlife Office in Ventura, California (see **FOR FURTHER INFORMATION CONTACT**).

List of Subjects in 50 CFR Part 17

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

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

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

Authority: 16 U.S.C. 1361–1407; 1531–1544; 4201–4245, unless otherwise noted.

■ 2. Amend § 17.11(h) by revising the entry for ''Toad, arroyo'' under ''Amphibians'' in the List of Endangered and Threatened Wildlife to read as follows:

§ 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							
*	*	* *	*		*	*	
Toad, arroyo (=arroyo southwestern).	*Anaxyrus californicus*	U.S.A. (CA), Mexico (Baja California).	Entire	T	568	17.95(d)	NA
*	*	* *	*		*	*	

Dated: March 16, 2014.

Rowan W. Gould,

Acting Director, U.S. Fish and Wildlife Service.

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