

**DRAFT ECONOMIC ANALYSIS OF
CRITICAL HABITAT DESIGNATION
FOR THE
ARROYO SOUTHWESTERN TOAD**

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Prepared for:

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PREFACE

1. This report was prepared for the U.S. Fish and Wildlife Service (Service) by Industrial Economics, Incorporated (IEc) to assess the economic impacts that may result from designation of critical habitat for the arroyo southwestern toad. Under section 4(b)(1) of the 1973 Endangered Species Act (Act), the decision to list a species as endangered or threatened is made solely on the basis of scientific data and analysis. By contrast, section 4(b)(2) of the Act states that the decision to designate critical habitat must take into account the potential economic impact of specifying a particular area as critical habitat. As such, this report does not address any economic impacts associated with the listing of the species. The analysis only addresses those incremental economic costs and benefits potentially resulting from the designation of critical habitat.
2. IEc worked closely with personnel from the Service and other Federal agencies to ensure that potential Federal nexuses as well as current and future land uses were appropriately identified, and to begin assessing whether or not the designation of critical habitat would have any net economic effect in the regions containing the proposed critical habitat designations. Identification of these land uses and Federal-agency actions provided IEc with a basis for evaluating the incremental economic impacts due to critical habitat designation for the arroyo southwestern toad.
3. Section 7 of the ESA authorizes the Service to consider, and where appropriate, make a determination that a Federal-agency action is likely to jeopardize the continued existence of a species or result in the destruction or adverse modification of critical habitat. IEc, therefore, also requested input from the Service officials concerning whether or not any of these projects would likely result in *an adverse modification determination without an accompanying jeopardy opinion*. It is important to note here that it would not have been appropriate for IEc to make such policy determinations.
4. This report represents characterization of possible economic impacts associated with the designation of critical habitat for the arroyo southwestern toad. To understand the concerns of stakeholders, IEc solicited opinions from the Service and other Federal agencies regarding the uses of land within the proposed critical habitat, historical consultations with the Service, potential future consultations, and the likely costs associated with future consultations. Using this information, this report characterizes cost and benefits likely to be associated with the designation of critical habitat for the arroyo southwestern toad.
5. IEc solicits further information associated with the categories of impact highlighted in this report, or with other economic effects of the critical habitat designation, that can be used to support the economic assessment. Since the focus of this report is an assessment of incremental impacts of proposed critical habitat, we request information on the potential effects of the designation on current and future land uses, rather than on effects associated with the listing of the arroyo southwestern toad, or of other Federal, state, or local requirements that influence land use.

EXECUTIVE SUMMARY

6. The purpose of this report is to identify and analyze the potential economic impacts that would result from the proposed critical habitat designation for the arroyo southwestern toad (hereafter "arroyo toad").¹ This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service's Division of Economics.
7. Section 4(b)(2) of the Endangered Species Act (Act) requires the Service to base critical habitat proposals upon the best scientific and commercial data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Proposed Critical Habitat

8. The Service has proposed 22 stretches of river and associated upland habitat as critical habitat for the arroyo toad. In aggregate, these 22 units represent approximately 478,400 acres across nine central and southern California counties. Approximately half of the proposed critical habitat is privately owned; remaining lands are owned or managed by Federal agencies, the State of California, California cities or counties, or by several Indian Tribes. In designating critical habitat for the arroyo toad, the Service was not able to map critical habitat in sufficient detail to exclude all developed areas. However, within the extant boundaries of the designation, only those lands with the appropriate primary constituent elements are considered critical habitat.

Framework and Economic Impacts Considered

9. This analysis defines an impact of critical habitat designation to include any effect the designation has above and beyond the impacts associated with the listing of the arroyo toad. Section 9 of the Act makes it illegal for any person to "take" a listed species, which is defined by the Act to mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or the attempt to engage in any such conduct.² To evaluate the increment of economic impacts attributable to the critical habitat designation for the arroyo toad, above and beyond the Act listing, the analysis assumes a "without critical habitat" baseline and compares it to a "with critical habitat" scenario. The difference between the two is a measurement of the net change in economic activity that may result from the designation of critical habitat for the arroyo toad.

¹ *Bufo microscaphus californicus*

² 15 U.S.C. 1531 et seq.

10. The “without critical habitat” baseline represents current and expected economic activity under all existing modifications prior to critical habitat designation. These include the take restrictions that result from the Act listing for the arroyo toad (and listings for other relevant species), as well as other Federal, state, and local requirements that may limit economic activities in the regions containing the proposed critical habitat units. This analysis focuses on potential costs and benefits of critical habitat for the arroyo toad, above and beyond any costs or benefits already in existence due to the species’ listing.

11. To estimate the incremental costs and benefits that critical habitat designation for the arroyo toad would have on existing and planned activities and land uses, the following framework was applied the following framework:
 1. Develop a comprehensive list of land use activities that are either conducted or planned on Federal, state, county, municipal, Tribal, and private lands in the proposed critical habitat areas.
 2. Identify any Federal nexuses associated with these activities.
 3. Solicit input from the Service to determine the extent to which designated critical habitat areas would be subject to consultations under the "without critical habitat" scenario.
 4. Assess the “with critical habitat” scenario for projects and land activities in proposed critical habitat units.
 5. Estimate the likely incremental costs associated with the arroyo toad critical habitat designation by comparing the “without critical habitat” baseline to the “with critical habitat” scenario.

12. Using the framework outlined above, this analysis evaluates potential costs and benefits associated with the proposed designation of critical habitat for the arroyo toad. Three primary categories of potential incremental costs are considered in the analysis. These include:
 - C Costs associated with conducting new section 7 consultations, the incremental costs (e.g., added administrative effort) of consultations already required under the listing of the species, and the cost of reinitiations or extensions of existing consultations that occurred under the listing of the toad.

 - C Costs associated with any modifications to projects, activities, or land uses, resulting from the outcome of section 7 consultation with the Service that would not have been required before critical habitat

designation.

- C Costs associated with uncertainty and public perceptions resulting from the designation of critical habitat. Uncertainty and public perceptions about the likely effects of critical habitat may cause changes in property values, third party law suits, and project delays, regardless of whether critical habitat actually imposes incremental regulatory burden.

13. Potential economic benefits considered in this analysis include use and non-use value. Non-use benefits associated with designation of critical habitat may include resource preservation or enhancement in the form of biodiversity, ecosystem health, and intrinsic (passive use) values.³ Use benefits associated with the proposed designation could include enhancement of recreational opportunities such as wildlife viewing. Finally, the public's perception of the potential importance of critical habitat may result in increases to property values, just as the perception of modifications may result in property value reductions, regardless of whether critical habitat generates actual changes in land use.
14. Due to the difficulty of predicting future consultations and future project modifications, the quantitative cost estimates provided in this assessment are limited. To the extent possible, the final version of this analysis will include a more substantial assessment of quantitative impacts. As such, information is solicited that can be used to support such an assessment, i.e., data describing the categories of costs and benefits highlighted in this report, or other incremental economic effects of the critical habitat designation.

Preliminary Results

15. The Service estimates that a total of 28 new consultations will occur as a result of the designation of critical habitat. Costs associated with these consultations include preparation of a biological assessment as well as the costs of the consultation itself (e.g. time spent in meetings, preparing letters, development of the biological opinion). The estimated total incremental costs range from approximately \$300,000 to \$500,000. These costs, according to the analysis of the designated regions, are equally distributed between the Pacific mid-coast and southern California. Due to the varied and uncertain nature of project modification costs (which would be an additional consideration for formal consultations), these costs are not estimated quantitatively. Instead, qualitative descriptions of past project modifications associated with section 7 consultations are provided.

³ Intrinsic values, also referred to as passive use values, include categories of economic benefits such as existence value, i.e., knowledge of continued existence of a resource or species; and bequest value, i.e., preserving the resource or species for future generations.

16. The economic impacts of the proposed designation of critical habitat on various landowners are as follows:

- C **Federal Lands:** The proposed critical habitat for the arroyo toad encompasses Federal landholdings. In addition, some Federal agencies are undertaking activities in proposed critical habitat areas. These Federal landholders and agencies include the U.S. Forest Service, the Department of Defense, the Bureau of Land Management, the U.S. Fish and Wildlife Service, the Federal Highway Administration/Federal Transportation Administration, the Immigration and Naturalization Service, and the Federal Emergency Management Agency. Federal landholders within the proposed critical habitat for the arroyo toad and Federal agencies undertaking activities on the proposed critical habitat would be obligated to consult with the Service to determine whether their activities may result in adverse modifications to critical habitat. To date, all such agencies already are consulting with the Service to determine whether their activities would jeopardize the toad. As a result, there will be few increases in costs, consultations, or project modifications to Federal activities as a result of the critical habitat designation for the arroyo toad. Exceptions include potential new consultations on grazing leases, and costs of increased surveying to determine the presence of primary constituent elements on certain Federal landholdings. In addition, existing consultations may be reinitiated to include impacts to critical habitat.

- C **State and Local Lands:** The proposed designation of critical habitat for the arroyo toad include some state and local government landholdings. In addition, water authorities upstream from critical habitat discharge into proposed critical habitat areas. Some water authorities that discharge into proposed critical habitat areas may be subject to additional consultations or project modifications in the event that their activities have a Federal nexus (e.g., an Clean Water Act section 404 permit). Additional impacts on other state and local government activities as a result of the critical habitat designation will probably be limited because those activities may not have a Federal nexus.

- C **Private Lands:** Activities on private lands proposed as critical habitat for the arroyo toad that may involve a Federal nexus include development, farming, and mining. In certain areas where occupancy by the toad was ambiguous in the past (e.g., Unit 6), there is a potential for new or extended consultations and project modifications associated with development and mining activities that have a Federal nexus. For farming activities, additional or extended consultations or project modifications beyond those required under the listing

of the toad are unlikely.

- C Tribal Lands:** To the extent that Tribal lands include areas where the toad's presence was unclear in the past, there may be new or extended consultations and project modifications associated with construction and mining activities that have a Federal nexus.

- C Additional Impacts:** Some small construction companies may be affected by any modifications to development projects, or project delays, associated with consultations that occur as a result of critical habitat designation for the toad. In addition, some landowners may incur costs to determine whether their land contains the primary constituent elements for the toad, may experience project delays, and may experience temporary changes in property values as markets respond to the uncertainty associated with critical habitat designation.

1. INTRODUCTION

SECTION 1

17. On December 16, 1994, following a review of information and public comments, the Service listed the arroyo southwestern toad (referred to as the "arroyo toad" throughout this report) as an endangered species in California (59 FR 64859). At the time of the listing, the Service found that designating critical habitat for the arroyo toad would not be prudent due to threats of habitat vandalism and collection of the toad.
18. Following the publication of the final listing rule, the Southwest Center for Biological Diversity, the Center for Biological Diversity, and Christians Caring for Creation filed a lawsuit against the Secretary of the Interior which challenged the legitimacy of the Service's finding that critical habitat for the arroyo toad and six other listed species was not prudent.⁴ Pursuant to the November 5, 1999 settlement agreement, the Service published the proposed designation of critical habitat for the arroyo toad on June 8, 2000 (65 FR 36512).
19. Under section 4(b)(2) of the Endangered Species Act (Act), the Service is required to consider designation of critical habitat for all species listed as endangered or threatened. Critical habitat refers to a geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat designation can help focus conservation activities for a listed species by identifying areas that have essential critical habitat features. Critical habitat designation contributes to Federal land management agencies' and the public's awareness of the importance of these areas.

⁴ Southwest Center for Biological Diversity vs. U.S. Fish and Wildlife, CIV 99-1003 MMC.

20. In addition to its informational role, the designation of critical habitat may provide protection where significant threats have been identified. This protection derives from section 7 of the Act, which requires Federal agencies to consult with the Service in order to ensure that activities they fund, authorize, or carry out are not likely to result in destruction or adverse modification of critical habitat. Under the Act listing of a species, Federal agencies must consult with the Service regarding any activities that could jeopardize the continued existence of the species. The Act regulations define jeopardy as any action that would appreciably reduce the likelihood of both the survival and recovery of the species. Similarly, the designation of critical habitat requires Federal agencies to consult with the Service regarding any action that could potentially adversely modify the species' habitat. Adverse modification of critical habitat is defined as any direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of the species.
21. The designation of critical habitat affects lands both occupied and unoccupied by the species. The Act defines occupied critical habitat as areas that contain the physical or biological features that are essential to the conservation of the species and that may require special management considerations or protection. Unoccupied critical habitat includes those areas that fall outside the geographical area occupied by the species, but that may meet the definition of critical habitat upon determination that they are essential for the conservation of the species. Unoccupied lands proposed as critical habitat frequently include areas inhabited by the species at some point in the past. Federal agencies will have to consult with the Service regarding any activities they fund, authorize, or carry out on both occupied and unoccupied land that may adversely modify critical habitat.

1.1 CONSULTATION UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT

22. Section 7(a)(2) of the Act requires Federal agencies to consult with the Service whenever activities they fund, authorize, or carry out may affect listed species or designated critical habitat. Section 7 consultation with the Service is designed to ensure that any current or future Federal actions do not appreciably diminish the value of the critical habitat for the survival and recovery of the species. Pursuant to Section 7 activities on land owned by individuals, organizations, states, local and Tribal governments only require consultation with the Service if their actions require a Federal permit, license, or other authorization, or if their actions involve Federal funding. Actions not affecting the species or its critical habitat will not require consultation under section 7, whether they be Federal actions, or actions on private land that are Federally funded, authorized, or permitted.
23. For consultations concerning activities on Federal lands, the relevant Federal agency consults with the Service. For consultations where the consultation involves an activity proposed by a state or local government or a private entity (the "applicant"), the Federal agency with the nexus to the activity (the "Action agency") serves as the liaison with the Service. The consultation process may involve both informal and formal consultation with the Service.

24. Informal section 7 consultation is designed to assist the Federal agency and any applicant in identifying and resolving potential conflicts at an early stage in the planning process. Informal consultation consists of informal discussions between the Service and the agency concerning an action that may affect a listed species or its designated critical habitat. In preparation for an informal consultation, the applicant must compile all biological, technical, and legal information necessary to analyze the scope of the activity and discuss strategies to avoid, minimize, or otherwise affect impacts to listed species or critical habitat.⁵ During the informal consultation, the Service makes advisory recommendations, if appropriate, on ways to minimize or avoid adverse effects. If agreement can be reached, the Service will concur in writing that the action, as revised, is not likely to adversely affect listed species or critical habitat. Informal consultation may be initiated via a phone call or letter from the Action agency, or a meeting between the Action agency and the Service.
25. A formal consultation is required if the proposed action is likely to adversely affect listed species or designated critical habitat in ways that cannot be avoided through informal consultation. Formal consultations determine whether a proposed agency action is likely to jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat. Determination of whether an activity will result in jeopardy to a species or adverse modification of its critical habitat is dependent on a number of variables, including type of project, size, location, and duration. If the Service finds, in their biological opinion, that a proposed agency action is likely to jeopardize the continued existence of a listed species and/or destroy or adversely modify the critical habitat, the Service may identify reasonable and prudent alternatives that are designed to avoid such adverse effects to the listed species or critical habitat.
26. Reasonable and prudent alternatives are defined at 50 CFR 402.02 as alternative actions that can be implemented in a manner consistent with the intended purpose of the action, that are consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that the Service believes would avoid jeopardizing the species or destruction or adverse modification of critical habitat. Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing reasonable and prudent alternatives vary accordingly.
27. Federal agencies are also required to evaluate their actions with respect to any species that is proposed as endangered or threatened and with respect to its proposed or designated critical

⁵Many applicants incur costs to prepare analyses as part of the consultation package. These costs vary greatly depending on the specifics of the project. Major construction activities, as referred to in the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.), require that a biological assessment be completed prior to informal consultation. In most cases, these costs are attributable to the fact that a species has been added to the list of threatened and endangered species rather than the designation of critical habitat.

habitat. Regulations implementing the interagency cooperation provisions of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act and regulations at 50 CFR 402.10 require Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a proposed species or to result in destruction or adverse modification of proposed critical habitat. Federal nexus are not affected, from a regulatory perspective, by critical habitat designation.

1.2 PURPOSE AND APPROACH OF ECONOMIC ASSESSMENT

28. Under the regulations promulgated pursuant to the Act, the Service is required to make its decision concerning critical habitat designation on the basis of the best scientific and commercial data available, in addition to considering economic and other relevant impacts of designating a particular area as critical habitat. The Service may exclude areas from critical habitat upon a determination that the benefits of such exclusions outweigh the benefits of specifying such areas as critical habitat. The purpose of this report is to identify and analyze the potential economic costs and benefits that could result from the proposed critical habitat designation for the arroyo toad.
29. The analysis must distinguish between economic impacts caused by the listing of the arroyo toad and those additional costs and benefits created by the proposed critical habitat designation. *This analysis only evaluates the economic impacts resulting from the proposed critical habitat designation that are above and beyond impacts caused by the listing of the arroyo toad under the Act.* Furthermore, if the land use or activity would be limited or prohibited (in the absence of critical habitat) by another existing statute, regulation or policy, the economic impacts associated with those limitations or prohibitions would not be attributable to critical habitat designation.
30. This analysis assesses how critical habitat designation for the arroyo toad may affect current and planned land uses and activities on Federal (including military), state/county/local, Tribal, and private land. For Federally-managed land, designation of critical habitat may lead to modification of land uses, activities, and other actions that threaten to adversely modify critical habitat. For state, county, local, Tribal and private land subject to critical habitat designation, modifications to land uses and activities can only be required when a "Federal nexus" exists (i.e., the activities or land uses of concern involve Federal permits, Federal funding, or other Federal actions). The Act does not require consultation under section 7 for activities occurring on state, local, Tribal and private land if those activities do not involve a Federal nexus.
31. To be considered in the economic analysis, activities must be "reasonably foreseeable," including but not limited to activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. The analysis considers potential economic impacts over the next ten years due to reasonably foreseeable activities on both occupied and unoccupied lands. Current and future activities that could potentially result in section 7 consultations

and/or modifications are considered.

1.3 STRUCTURE OF REPORT

32. The remainder of the report is organized as follows:

- C **Section 2: Species Description and Relevant Baseline Information** - Provides general information on the species, a brief description of the proposed critical habitat units, and regulatory and socioeconomic information describing the baseline (i.e., the "without critical habitat" scenario).

- C **Section 3: Analytic Framework** - Describes the framework and methodology for the analysis and discusses the information sources used.

- C **Section 4: Results** - Presents the findings of the analysis.

**2. SPECIES DESCRIPTION AND
RELEVANT BASELINE INFORMATION⁶**

SECTION 2

2.1 DESCRIPTION OF SPECIES

33. The arroyo southwestern toad (*Bufo microscaphus californicus*) is a small, dark-spotted toad of the family Bufonidae. The arroyo toad is found in coastal and desert drainages from Monterey County, California, south into northwestern Baja California, Mexico. The arroyo toad has suffered from habitat losses or alterations as a result of the spread of agriculture and urban development, streambed sand and gravel mining, the damming of rivers, road construction, and the development of recreational facilities such as campgrounds and off-road vehicle parks. In addition, arroyo toads are affected by the introduction of non-native plants and predator species, and by natural climatic variations and random events such as fires and floods. Because of these activities and occurrences, since the 1920s the arroyo toad has been eliminated from roughly 75 percent of its historic range.
34. The arroyo toad's preferred breeding habitat consists of shallow pools and open sand and gravel channels along low-gradient reaches of medium to large-sized streams. These streams can have either intermittent or perennial streamflows and typically experience periodic flooding that scours vegetation and replenishes fine sediments. During the non-breeding season, arroyo toads may also inhabit upland areas, including alluvial scrub, coastal sage scrub, chaparral, grassland and oak woodlands. Arroyo toads have been observed as far as 2 kilometers (1.2 miles) from the streams in which they breed, but are most commonly found within one-half kilometer of these streams.

⁶ The information on the arroyo toad and its critical habitat included in this section was obtained from the *Proposed Designation of Critical Habitat for the Arroyo Southwestern Toad*, U.S. Fish and Wildlife Service, June 8, 2000 and the *Arroyo Southwestern Toad (Bufo microscaphus californicus) Recovery Plan*, Region 1, U.S. Fish and Wildlife Service, September, 1999.

2.2 PROPOSED CRITICAL HABITAT UNITS

35. The Service has proposed the designation of 22 arroyo toad critical habitat units, divided into three geographically and ecologically distinct recovery units. They represent the drainage basins identified in the recovery plan as areas that should be maintained or rehabilitated in order to achieve the recovery of the arroyo toad. The recovery strategy focuses on providing sufficient breeding and upland habitat to maintain self sustaining populations throughout the species' historic range in California.
36. Each critical habitat unit is focused on a primary river drainage that provides the appropriate constituent elements necessary for the survival and recovery of the arroyo toad.⁷ Critical habitat includes both riparian and upland habitats; upland habitats are defined as the sandy alluvial terraces extending up to an elevation of 80 feet above the designated stream or riverbed. Units do not, however, extend further than 1.5 kilometers from the streambed.
37. The boundaries of the proposed critical habitat areas may include some lands that lack the primary constituent elements necessary for the arroyo toad. Developed areas such as shopping centers, housing developments or other paved lands that do not include one or more of the constituent elements necessary for the arroyo toad are not considered critical habitat even if they lie within proposed critical habitat boundaries.
38. The Service has designated critical habitat for only those areas with known arroyo toad populations. As discussed in the recovery plan, documented arroyo toad sightings have occurred in at least the main river drainage in each of these 22 units. In most cases, this documentation stems from surveys conducted in the latter half of the 1990s. Toads move around substantially within stream or rivers, so that in any given season they may occupy a large section of riparian and upland habitat. In addition, the physical configuration of streams changes over time through erosion and deposition processes. As a result, the Service has classified each of the 22 critical habitat units as occupied.
39. Exhibit 2-1 provides basic information about each critical habitat unit, including the total acreage, the creeks and streams that lie within the unit, and the county in which the unit is located. The units range in size from 3,000 acres (Unit 8) to 44,500 acres (Unit 9), and they encompass public, private, and Tribal lands.

⁷ See the *Arroyo Southwestern Toad (Bufo microscaphus californicus) Recovery Plan or Proposed Designation of Critical Habitat for the Arroyo Southwestern Toad* for further discussion of the arroyo toad's primary constituent elements and the methods for choosing critical habitat.

Exhibit 2-1				
PROPOSED CRITICAL HABITAT UNITS				
Critical Habitat Unit Number	Critical Habitat Unit Name	Other Creeks and Streams Included	Acres	County
Northern Recovery Unit				
1	San Antonio River		22,600	Monterey
2	Sisquoc River and Tributaries		28,900	Santa Barbara, San Luis Obispo
3	Upper Santa Ynez River Basin	Indian Creek, Mono Creek, Agua Caliente	14,100	Santa Barbara
4	Sespe Creek		14,300	Ventura
5	Piru Creek (Upper and Lower)	Agua Blanca Creek	19,300	Ventura and Los Angeles
6*	Upper Santa Clara River Basin	Castaic Creek, Fish Creek, San Francisquito Creek	34,300	Los Angeles
7	Upper Los Angeles Basin	Big Tujunga Creek, Mill Creek, Alder Creek, Arroyo Seco	21,500	Los Angeles
Southern Recovery Unit				
8	Santiago Creek	Black Star Creek	3,000	Orange
9	San Jacinto and Bautista Creek	Indian Creek	13,300	Riverside
10*	San Juan Basin and Trabuco Creeks	Bell Canyon	21,300	Orange and Riverside
11*	San Mateo and San Onofre Creek Basins	Jardine Canyon, Christianitos Creek, Gabino Creek, La Paz Creek, Talega Creek	27,600	San Diego and Orange
12*	Lower Santa Margarita Basin	De Luz Creek, Roblar Creek, Sandia Creek	24,200	San Diego

Critical Habitat Unit Number	Critical Habitat Unit Name	Other Creeks and Streams Included	Acres	County
13*	Upper Santa Margarita Basin	Temecula Creek, Wilson Creek, Arroyo Seco	24,200	Riverside and San Diego
14*	Lower and Middle San Luis Rey Basin	Keys Creek	33,100	San Diego
15	Upper San Luis Rey Basin	Agua Caliente Creek, West Fork of the San Luis Rey	18,300	San Diego
16*	Santa Ysabel Creek	Temescal Creek, Guejito Creek, Santa Maria Creek	23,500	San Diego
17*	San Diego River Basin	San Vicente Creek	12,600	San Diego
18*	Sweetwater River Basin	Peterson Canyon, Viejas Creek	28,200	San Diego
19	Cottonwood Creek Basin	La Posta Creek, Morena Creek, Kitchen Creek, Potrero Creek, Pine Valley Creek, Scove Canyon, Noble Creek	44,500	San Diego
Desert Recovery Unit				
20	Little Rock Creek	Santiago Creek	7,400	Los Angeles
21	Upper Mojave River Basin	Mojave River, West Fork of the Mojave, Deep Creek, Horsethief Canyon, Little Horsethief Creek	35,100	San Bernardino
22	Whitewater River Basin		5,900	Riverside
* Units overlap with proposed critical habitat for the California gnatcatcher.				
Notes: Due to a discrepancy in the proposed rule, the sum of acreages in the units does not equal the total reported in the proposed rule.				
Source: U.S. Fish and Wildlife Service, <i>Proposed Designation of Critical Habitat for the Arroyo Southwestern Toad</i> , June 8, 2000.				

40. Exhibit 2-2 summarizes the distribution of the critical habitat acreage by type of landowner and by county. Approximately 47 percent of the critical habitat area is under Federal management, approximately 48 percent is privately owned, approximately 4 percent is controlled by state and local governments, and approximately 2 percent is controlled by Native American Tribes. San Diego County and Los Angeles County contain the largest amount of the proposed critical habitat (44.7 percent and 14.5 percent, respectively). The remainder is divided among seven other southern and central California counties. Exhibit 2-3 provides additional details regarding management/ownership of public and private lands within the proposed critical habitat areas.

Exhibit 2-2		
PROPOSED CRITICAL HABITAT ACREAGE BY LAND OWNER AND BY COUNTY		
Manager, Holder or Owner of Proposed Critical Habitat	Total Acres	Percentage of Total
U.S. Department of Agriculture, Forest Service	147,255	30.8
Department of Defense	64,499	13.5
Other Federally Owned or Managed Lands	11,491	2.4
State and Local Public Lands	17,955	3.8
Tribal Lands	8,475	1.8
Private Lands	228,745	47.8
Critical Habitat by County		
Monterey	22,552	4.7
San Luis Obispo	625	0.1
Santa Barbara	42,326	8.8
Ventura	27,480	5.7
Los Angeles	69,387	14.5
San Bernardino	35,089	7.3
Riverside	38,545	8.1
Orange	28,449	5.9
San Diego	213,963	44.7
Note: Total acreage by land ownership and by county are not exactly equal because of rounding error.		

Exhibit 2-3			
PROPOSED CRITICAL HABITAT BY LAND HOLDER OR MANAGER			
Landowner distribution in each County	Critical Habitat Units	Land parcels	Acreage
US DEPARTMENT OF AGRICULTURE, FOREST SERVICE			
Santa Barbara	2 and 3	Los Padres National Forest	22,260
Ventura	4 and 5	Los Padres National Forest	26,130
Los Angeles	5, 6, 7 and 20	Los Padres National Forest and Angeles National Forest	34,382
San Bernardino	21	San Bernardino National Forest	9,204
Riverside	9, 10 and 13	San Bernardino National Forest and Cleveland National Forest	7,738
Orange	8 and 10	Cleveland National Forest	2,910
San Diego	13, 15 -19	Cleveland National Forest	44,631
US DEPARTMENT OF DEFENSE			
Monterey	1	Fort Hunter Ligget Military Reservation	22,013
San Bernardino	21	Miscellaneous	3,017
Orange	8, 11	Miscellaneous	125
San Diego	11 and 12	Camp Pendleton Marine Corps Base and Fallbrook Naval Weapons Station	39,344
BUREAU OF LAND MANAGEMENT			
Los Angeles	6, 7	Miscellaneous	143
San Bernardino	21	Miscellaneous	1,225
Riverside	13	Miscellaneous	4,817
San Diego	17, 19, 22	Miscellaneous	3,519
US FISH AND WILDLIFE SERVICE			
San Diego	18	Miscellaneous	1,787
STATE PUBLIC LANDS			
San Bernardino	21	Silverwood Lake State Recreation Area	2,016
Riverside	9, 10	Miscellaneous	255
Orange	8, 10	Miscellaneous	108
San Diego	11 and 18	San Onofre State Beach and Cuyamaca Ranch State Park	5,480*
CITY AND COUNTY PUBLIC LANDS			
Los Angeles	7	City of Pasadena	143
Orange	10	O'Neill Regional Park	4,473
San Diego	16, 18 and 19	City of San Diego, San Diego Wildlife Refuge and Lake Morena County Park	5,480*

Exhibit 2-3(continued)			
PROPOSED CRITICAL HABITAT BY LAND HOLDER OR MANAGER			
Landowner distribution in each County	Critical Habitat Units	Land parcels	Acreage
TRIBAL LANDS			
Riverside	9	Soboba Indian Reservation	815
San Diego	14 - 19	Pala, Rincon, Capitan Grande, Barona, Sycuan, Viejas, and La Posta Indian Reservations	7,660
PRIVATE LANDS			
Monterey	1	All units except Units 1 and 4 include at least 5 percent private land	539
San Luis Obispo	2		625
Santa Barbara	2 and 3		20,066
Ventura	4 and 5		1,350
Los Angeles	5-7, 20		34,719
San Bernardino	21		19,627
Riverside	9 and 10		24,920
Orange	8, 10 and 11		20,833
San Diego	11-19		106,066
*For San Diego county, only aggregate data for acreage under state and local ownership within the proposed critical habitat units was available at the time of this report's publication. In this table, the total acreage for state and local ownership (10,960) is equally divided between local and state ownership.			

2.3 RELEVANT BASELINE INFORMATION

41. The economic analysis considers the *incremental* impact of critical habitat designation for the arroyo toad—the impact above and beyond the impacts due to existing regulations. Thus, the analysis begins by reviewing existing regulations and requirements that provide an existing level of protection for arroyo toad habitat. In combination with the protection provided under the listing of the toad as an endangered species, these statutes form a baseline of environmental protection for areas proposed as critical habitat. Context for the analysis is provided by presenting data on the socioeconomic characteristics of the nine southern California counties where arroyo toad critical habitat has been proposed.

2.3.1 Baseline Regulations

42. In December 1996, the Service elected to list the arroyo toad as an endangered species. As

discussed above, under the listing, Federal agencies must consult with the Service regarding any actions they fund, authorize, or carry out that may adversely affect the species. The listing of the toad is the most significant aspect of baseline protection, as it provides the most protections since it makes it illegal for any person to "take" a listed species, which is defined by the Act to mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.

43. In addition, many of the areas proposed as arroyo toad critical habitat are also occupied by other listed species. Nine of the 22 units overlap with proposed critical habitat for the California gnatcatcher.⁸ Section 7 consultations are frequently conducted for multiple species. For example, consultations for the red-legged frog and least Bell's vireo are often combined with those for the arroyo toad because they share similar habitat. In general, if a consultation is triggered for any listed species, the consultation process will then consider all species known or thought to occupy areas on or near the project lands.⁹ In cases where a formal consultation would likely not have been required for the arroyo toad in the absence of critical habitat designation, formal consultation may still be necessary for these other listed species. In such cases, however, the Service would not consider the arroyo toad in its biological opinion, and any project design changes would not be specifically tailored to arroyo toad needs.
44. Furthermore, the State of California maintains environmental regulations which may affect the units proposed as critical habitat for the arroyo toad. Under the California Environmental Quality Act (CEQA), the environmental impacts of all major projects must be evaluated. If an initial study finds that the expected environmental impacts are "significant," applicants must adopt methods to avoid or mitigate those effects.¹⁰ To aid in this process, applicants must conduct an Environmental Impact Report (EIR) which includes an assessment of the project's potential effect on endangered species. An EIR is required for any major "project" that may have a significant impact on the environment. The definition of "project" includes open-pit mining subject to the Surface Mining and Reclamation Act, such as sand and gravel dredging activities; public works construction; clearing and grading of land; improvements to existing public structures; and projects requiring public issuance of a lease, permit, license or certificate.
45. Because the primary constituent elements of the toad's critical habitat are in or near streams, regulations governing projects in streams form a significant aspect of baseline protection. For example, sand and gravel mining in stream channels is regulated by California's Department of Fish

⁸ Only Unit 10 overlaps significantly with proposed critical habitat for the California gnatcatcher. Coastal sage scrub, the primary constituent element for the California gnatcatcher, is also a primary constituent element for the arroyo toad in its upland habitat.

⁹ U.S. Fish and Wildlife Service staff, Calsbad, CA, personal communication.

¹⁰ Section 5 of CEQA provides guidelines for determining whether a project may have significant environmental impacts.

and Game (the "Department"). Under the Department's regulations, rivers designated as "Class A" are protected from all dredging activities. Exhibit 2-4 lists those creeks and river stretches included in proposed arroyo toad critical habitat that are ranked Class A.

Exhibit 2-4				
CLASS A RIVERS WITHIN ARROYO TOAD PROPOSED CRITICAL HABITAT UNITS				
Stream Name	Critical Habitat Unit Name	Critical Habitat Unit Number	County	Notes
Sespe Creek	Sespe Creek	Unit 4	Ventura	Main stem from Los Padres National Forest boundary upstream to the Tule Creek confluence.
Piru and Tributaries	Piru Creek	Unit 5	Ventura and Los Angeles	
Santa Clara River and Tributaries	Upper Santa Clara River Basin	Unit 6	Ventura and Los Angeles	
Santiago Creek	Santiago Creek	Unit 8	Orange	Within Cleveland National Forest
San Juan Creek and Tributaries	San Juan Basin and Trabuco Creeks	Unit 10	Orange and Riverside	
San Mateo Creek and Tributaries	San Mateo and San Onofre Creek Basins	Unit 11	San Diego and Orange	
Little Rock Creek	Little Rock Creek	Unit 20	Los Angeles	Main stream and its tributaries from the Sycamore Campground in Angeles National Forest
Deep Creek	Upper Mojave River Basin	Unit 21	San Bernardino	

Source: California Department of Fish and Game.

46. In addition, under the California Fish and Game Code, any party proposing a project that will substantially divert, obstruct the natural flow, or substantially change the bed, channel, or bank of any river, stream or lake, or use materials from a streambed, must notify the Department before initiating activity.¹¹ Under this program, notification is generally required for any project that will take place in or near the vicinity of a river, stream, or their tributaries. If the Department determines that the proposed project may substantially adversely affect existing fish and wildlife resources, the applicant must obtain a Lake or Streambed Alteration Agreement from the Department. Unless otherwise exempt, the project must then be reviewed in accordance with CEQA before work can begin.¹²

47. Finally, California’s Department of Fish and Game runs a Significant Natural Areas (SNA) Program, established to identify high-priority sites for the conservation of California’s biological diversity and to inform resource decision-makers about the importance of these sites. Although the

¹¹ Section 1603 of the California Fish and Game Code.

¹² Pub. Resources Code, section 21000 et seq.

identification of SNAs is strictly for educational purposes and provides no regulatory control, the program provides coordinating services for public and private agencies to seek the long-term perpetuation of these areas. All of the proposed arroyo toad critical habitat units overlap, at least in part, with one or more Significant Natural Areas. The whole of units 1 and 4, and almost all of units 5, 10, and 12, are completely encompassed within SNAs.

2.3.2 Socioeconomic Profile of the Critical Habitat Areas

48. To provide context for the discussion of potential economic impacts due to critical habitat designation, this section summarizes key economic and demographic information for the nine counties containing the 22 critical habitat units. The data indicate whether or not particular counties are experiencing rapid development, and they indicate the extent to which these counties rely on industries likely to be affected by critical habitat (such as construction and mining). The information presented in this section is intended simply as background for the analysis; there is not necessarily a relationship between these data and the incremental economic impacts due to critical habitat.
49. The nine counties containing proposed critical habitat for the arroyo toad are characterized by widespread residential development. Many of the 22 critical habitat units lie on the developing fringe of the greater Los Angeles and San Diego metropolitan areas. Exhibit 2-5 provides information on population and housing growth rates in the central and southern California counties affected by proposed critical habitat for the arroyo toad.¹³ As shown, seven of the nine counties have seen housing growth rates of over 10 percent during the 1990s; Riverside's growth rate was almost 30 percent.
50. Although several of these counties experienced relatively modest overall housing growth rates during the 1990s (for example, Los Angeles County's ten year housing growth rate was only 3.3 percent), many of the proposed critical habitat units lie on the outer fringes of these counties, where much of the recent housing development has been concentrated. Thus, growth rates for cities located near proposed critical habitat units may be more informative than overall county growth rates. Exhibit 2-6 provides data on growth rates for cities near proposed critical habitat units. Note the extremely high growth rates (approximately 70 percent) for the cities of Hemet, San Jacinto, and Victorville.

¹³ Data for detached housing units only are included because these predominate in the suburban southern California areas that overlap with the proposed arroyo toad critical habitat.

Exhibit 2-5

COUNTY POPULATION AND HOUSING GROWTH, 1990 TO 2000

County	Population (2000)	Population as Percentage of State Total	Total Detached Housing Units (1990)	Total Detached Housing Units (2000)	Absolute Growth 1990-2000	Percent Growth, 1990-2000
Monterey	399,300	1.2%	69,768	79,179	9,411	13.5%
San Luis Obispo	245,200	0.7%	55,738	65,591	9,853	17.7%
Santa Barbara	414,200	1.2%	78,510	83,311	4,801	6.1%
Ventura	756,500	2.2%	142,782	158,996	16,214	11.4%
Los Angeles	9,884,300	28.8%	1,538,020	1,588,957	50,937	3.3%
San Bernardino	1,689,300	4.9%	361,598	418,949	57,351	15.9%
Riverside	1,522,900	4.4%	274,685	355,756	81,071	29.5%
Orange	2,828,400	8.2%	434,510	485,893	51,383	11.8%
San Diego	2,911,500	8.5%	469,705	525,945	56,240	12.0%
California	34,336,000		6,119,010	6,853,693	734,683	12.0%

Notes: California has a total of 58 counties.

Sources: January 2000 County Rankers by Size, Numeric Change and Percentage Change, with Revised January 1999 Estimates, California Demographics, California Department of Finance.

State of California, Department of Finance, City/County Population and Housing Estimates, 1991-2000, with 1990 Census Counts. Sacramento, California, May 2000.

Exhibit 2-6					
HOUSING GROWTH FOR CITIES LOCATED NEAR CRITICAL HABITAT UNITS					
City	County	Critical Habitat Unit	1990 Total Detached Housing Units (1,000s)	2000 Total Detached Housing Units (1,000s)	Percent Growth 1990-2000
Santa Maria	Santa Barbara	Unit 2	12,319	13,962	13.3%
Santa Clarita	Los Angeles	Unit 6	22,938	29,846	30.1%
San Fernando	Los Angeles	Unit 7a	3,900	3,825	-1.9%
Orange	Orange	Unit 8	13,342	15,391	15.4%
Yorba Linda	Orange	Unit 8	21,542	23,696	10.0%
Irvine	Orange	Unit 8	16,490	20,191	22.4%
Hemet	Riverside	Unit 9	7,069	11,997	69.7%
San Jacinto	Riverside	Unit 9	3,062	5,360	75.0%
Santee	San Diego	Unit 17	9,817	10,713	9.1%
Palmdale	Los Angeles	Unit 20	24,439	30,489	24.8%
Apple Valley	San Bernardino	Unit 21	12,128	14,972	23.4%
Victorville	San Bernardino	Unit 21	9,500	15,840	66.7%
Note: Although the number of detached housing units in San Fernando decreased by 1.9 percent during the 1990s, the number of total housing units increased by 3.4 percent.					
Source: State of California, Department of Finance, <i>City/County Population and Housing Estimates 1991-2000, with 1990 Census Counts</i> . Sacramento, California, May 2000.					

51. Critical habitat designation for the toad may lead to economic impacts on the construction industry (especially residential and commercial development), the sand and gravel mining industry, and agriculture. In order to provide context for these impacts and to characterize the importance of each of these industries within local economies, Exhibit 2-7 presents data on county income levels and the percentage of total county earnings derived from these three industries. Construction earnings range from two to five percent of total county income, with the lowest percentage in Monterey County and the highest in San Luis Obispo.¹⁴ These percentages include construction earnings for *all* building activities, not just the residential and commercial development that is likely to occur in proposed critical habitat areas. For each of the counties, mining earnings make up less than one percent of total earnings. Agricultural earnings make up less than three percent of total earnings in all counties except Monterey.

¹⁴ Only 625 acres of land have been proposed as critical habitat in San Luis Obispo County.

Exhibit 2-7

**COUNTY WEALTH, AND FARMING, CONSTRUCTION AND MINING EARNINGS
(1997)**

County Name	Per Capita Personal Income (\$)	Total County Income (\$1,000s)	Total Farm Earnings (\$1,000s)	Farm Earnings (%)*	Total Construction Earnings (\$1,000s)	Construction Earnings (%)*	Total Mining Earnings (\$1,000s)	Mining Earnings (%)*
Monterey	25,747	9,226,664	775,630	8.41%	265,492	2.88%	7,011	0.08%
San Luis Obispo	22,568	5,222,612	105,093	2.01%	264,763	5.07%	9,273	0.18%
Santa Barbara	27,839	10,760,412	291,652	2.71%	389,677	3.62%	80,209	0.75%
Ventura	26,563	19,173,001	402,932	2.10%	719,340	3.75%	134,263	0.70%
Los Angeles	25,719	234,469,261	171,514	0.07%	6,446,561	2.75%	465,141	0.20%
San Bernardino	18,673	30,035,553	163,474	0.54%	1,212,587	4.04%	46,834	0.16%
Riverside	20,645	29,712,911	241,784	0.81%	1,357,784	4.57%	28,483	0.10%
Orange	30,115	80,213,558	123,529	0.15%	3,308,447	4.12%	83,826	0.10%
San Diego	24,965	67,997,758	219,229	0.32%	2,638,662	3.88%	30,916	0.05%

*Note: Farming, mining, and construction income as a percentage of total county income. Construction earnings include earnings for general building contractors, heavy construction contractors, and trade contractors. Mining earnings include metal mining, coal mining, oil and gas extraction, and nonmetallic mineral mining (excepting fuels).

Sources: *Personal Income by Major Source and Earnings by Industry, Regional Economic Information System: 1969-1997.*

3. ANALYTICAL FRAMEWORK

SECTION 3

52. In this section, an overview is provided of the framework used to evaluate the costs and benefits of the proposed designation of critical habitat for the arroyo toad. The sources of information used in the analysis are also discussed.

53. This economic analysis considers the impacts of modifications to specific land uses or activities within those areas proposed as critical habitat for the arroyo toad. The analysis evaluates impacts in a “with critical habitat” designation in comparison to a “without critical habitat” baseline, measuring the net change in economic activity attributable to the critical habitat proposal. The “without critical habitat” scenario, which represents the baseline for the analysis, includes all protection already accorded to the toad under Federal laws and state laws, such as CEQA. The difference between the two scenarios is a measurement of the net change in economic activity that may result from the designation of critical habitat.

54. The listing of the arroyo toad under the Act is the most significant aspect of baseline protection, as it provides the most protections since it makes it illegal for any person to "take" a listed species, which is defined by the Act to mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Although the listing of a species may have significant economic impacts on landowners, businesses, and communities, such impacts are not considered in this analysis. This analysis focuses only on the potential incremental effects associated with proposed government action on areas proposed as critical habitat.

3.1 Categories of Economic Impacts

55. The focus of this economic analysis is to determine the incremental costs and benefits to land uses and activities from the designation of critical habitat for the arroyo toad that are above and beyond those that result from existing Federal, state, and local laws. The potential impacts of critical

habitat designation on both current and proposed land use activities will be considered. Potential costs associated with critical habitat designation include consultation costs under section 7 of the Act, costs associated with modifications to projects, activities, and land uses, and costs associated with uncertainty and misperceptions. Benefits are more difficult to assess and include both use and non-use benefits. Exhibit 3-1 outlines the categories of costs and benefits considered in this analysis.

Exhibit 3-1		
POTENTIAL ECONOMIC IMPACTS DUE TO CRITICAL HABITAT		
	Categories of Costs and Benefits	Examples
Costs	Costs associated with section 7 consultations: C new consultations C reinitiated consultations C extended consultations.	Administrative costs (e.g., phone calls, letter writing, meetings, travel time) and specialist consultant costs (e.g., biologists, surveyors or legal counsel).
	Costs of modifications to projects, activities and land uses.	Opportunity costs associated with seasonal change of project (e.g., activity limited to non-breeding seasons), or the relocation of project activities (e.g., moving construction further away from a streambed).
	Costs associated with uncertainty and misperceptions of critical habitat effects: C changes in property values C project delays C legal costs.	Transitory decline in value of properties within critical habitat, based on the public's perception that critical habitat will result in project modifications; legal suits brought against development in critical habitat areas.
Benefits	Benefits associated with uncertainty and perceptions of critical habitat effects.	Transitory increases in value of properties within critical habitat, based on the public's perception that critical habitat will slow development.
	Recreational and other use benefits.	Improvements to wildlife viewing.
	Non-use benefits.	Enhancements to resource preservation (increased biodiversity, ecosystem health) and existence values.

56. The most significant economic costs of critical habitat designation are likely to be associated with more numerous or lengthier consultations with the Service under section 7 of the Act. Potential costs associated with section 7 consultations due to proposed critical habitat include: (1) the value of time spent in conducting section 7 consultations beyond those associated with the listing of the arroyo toad and (2) modifications to land uses and activities (including project delays) as a result of these consultations. The Service recognizes three scenarios associated with the designation of critical habitat that could trigger incremental consultation costs:

1. New consultations may be required that would not have taken place without the designation of critical habitat;
2. Consultations taking place after critical habitat designation may take more time and effort because critical habitat issues will need to be addressed;
3. Some consultations that have already been “completed” may need to be reinitiated to address critical habitat considerations.

57. Critical habitat could also result in economic costs triggered by the public's perception of the impact of critical habitat on particular land parcels subject to the designation. Public perception that critical habitat could result in project modifications may lead to real reductions in property values and increased costs to landowners. For example, a perception held by potential buyers that crime is high in a given neighborhood, when in fact the area has no greater crime rate than other areas, can negatively influence the value of individual properties in the neighborhood. As more information on actual conditions becomes available to the market over a period of time, the influence of the public's initial perception subsides. A similar pattern of public attitudes about the limits and costs that critical habitat may impose can cause real economic effects. These impacts may occur even in cases in which additional project modifications are unlikely to be imposed.

58. Uncertainty about the impacts of critical habitat also could result in increased transactions costs to landowners. For example, many landowners have elected to retain counsel, surveyors and other specialists to determine whether their lands lie within critical habitat boundaries, and/or whether the primary constituent elements for a species are present. Thus, uncertainty over the status of lands has the potential to create real economic costs as land owners take action to gain information or mitigate possible effects of critical habitat designation. Moreover, such uncertainties may create delays, or in some cases may lead to changes in land use decision-making, thereby resulting in opportunity costs.

59. In addition to considering potential economic impacts attributable to the proposed critical habitat designation, this analysis also considers economic benefits that may result from the designation. Resource preservation or enhancement, which may be aided by designation of critical

habitat, may constitute an increase in recreational and non-recreational values provided directly by the species and indirectly by its habitat. Such categories of potential benefits for the arroyo toad include enhancement of wildlife viewing, increased biodiversity and ecosystem health, and intrinsic (passive use) values. Furthermore, designation of critical habitat could potentially lead to earlier recovery of the species, thus decreasing regulatory costs associated with its listing. Finally, the public's perception of the potential importance of critical habitat may result in increases in property values, regardless of whether critical habitat generates such impacts.

3.2 Methodological Approach

60. As discussed in Section 1, from a regulatory perspective, critical habitat can only affect current or planned land uses in cases where a Federal nexus is involved. In such cases where current or future activities on state, county, municipal, or private lands involve Federal funding, Federal permitting, or other Federal involvement, section 7 consultation with the Service is required if the proposed government action may affect a listed species or designated critical habitat. From a regulatory perspective, activities on non-Federal lands that do not involve a Federal nexus are not impacted by the designation of critical habitat. As a result, this report assesses potential economic impacts from critical habitat designation by first identifying current and future land uses within the proposed critical habitat. Once activities have been identified, the analysis evaluates whether each activity is likely to involve a Federal nexus. Each potential Federal nexus is then evaluated to determine the likelihood of incremental consultations and the probability of resultant project modifications or other costs and benefits. The specific steps involved in the analysis are as follows:

1. Identify those activities taking place or likely to take place on proposed critical habitat for the arroyo toad.
2. Consider which of these activities have a Federal nexus.
 - C For Federally-owned lands or Federally-conducted activities, all such projects are subject to consultation if they may affect a listed species or modify its critical habitat.
 - C For non-Federal lands, determine whether proposed activities potentially involve a Federal nexus (i.e., Federal permits, Federal funding, or other Federal involvement).

3. Review historical patterns for section 7 consultations in the proposed critical habitat area to determine the likelihood that nexuses are liable to result in consultations with the Service. However, as historical patterns are not necessarily accurate predictors of future events, current information and the professional judgement of the Service and other Federal agency staff were considered regarding the likelihood of new, reinitiated, or incrementally extended consultations.
4. Consider the types of project modifications and potential benefits that may result from any newly-required section 7 consultations, as well as incremental costs and benefits of habitat considerations during already-required consultations or consultation reinitiations. These costs may vary depending on whether the applicant is a government agency (lower cost) or an individual. However, the estimates in this report are based on costs to a private applicant, which is a more inclusive (and hence higher-end) estimate.
5. Evaluate other incremental costs and benefits that may originate from the proposed designation (e.g., changes in property values, project delays, and enhanced recreational opportunities).

3.3 Information Sources

61. The analysis relies on input and information from Service staff, state and local government officials, private landowners, water authority officials, and public hearing testimony. In addition, public comments on the proposal for arroyo toad critical habitat were reviewed. The final economic analysis will fully consider all public comments submitted in response to the draft economic analysis.

4. RESULTS

SECTION 4

62. This section discusses the potential costs and benefits of the proposed critical habitat designation. To the extent possible, quantitative estimates of these costs and benefits are presented. However, in situations where costs or benefits are extremely uncertain or difficult to quantify, the potential incremental economic impacts from critical habitat are described qualitatively. The section begins with a more detailed discussion of economic impacts and potential project modifications organized by landowner. This is followed by a summary of the costs associated with potential new consultations for each proposed critical habitat unit.

4.1 POTENTIAL IMPACTS AND PROJECT MODIFICATIONS BY LANDOWNER

63. This subsection describes the incremental impact of critical habitat designation in greater detail. The discussion is organized by type of landowner and is divided into four sections: Federal, state and local, private, and tribal. Where there is a potential for incremental project modifications due to critical habitat, these modifications are described qualitatively.

4.1.1 Federal Land

U.S. Forest Service

64. As outlined in the Forest Service Manual, National Forest lands are to be managed to

encourage species recovery so that they can be reclassified or delisted.¹⁵ Following this mandate, the Forest Service has already conducted significant mitigation activities to limit effects on arroyo toads present on National Forest lands. These mitigation activities include closing campgrounds and roads in Los Padres National Forest on a seasonal basis, closing approximately 3,000 acres of arroyo toad habitat in Angeles National Forest permanently, and eliminating off-road vehicle use on several streambeds in San Bernardino National Forest.¹⁶ The Service has conducted several consultations with the Forest Service that have, in part, led to the land use changes described above. There will likely be additional consultations on the arroyo toad with the Forest Service regardless of critical habitat designation. Because such consultations are already planned, critical habitat designation is not likely to lead to any additional consultations. Thus, the costs and benefits of critical habitat designation on Forest Service lands will likely be insignificant. However, the Forest Service may expend some additional effort in determining whether all designated critical habitat areas within its boundaries contain the appropriate primary constituent elements.

U.S. Department of Defense

65. Department of Defense (DoD) lands included in the proposed critical habitat designation include Fort Hunter Liggett Military Reservation (Unit 1), Camp Pendleton Marine Corps Base (Units 11 and 12), and Fallbrook Naval Weapons Station (Unit 12). In consultation with the Service, both Fort Hunter Liggett and Camp Pendleton/Fallbrook Weapons Station have already developed resource management plans to address impacts associated with military activities on endangered and threatened species.¹⁷
66. Camp Pendleton, in particular, has already conducted an in-depth consultation for activities conducted in riparian habitats. This consultation has addressed the impacts of ongoing military training, recreation (hunting, mountain biking, horseback riding, and use of San Onofre State Beach), water releases from O'Neill Lake, and leasing of base land to agricultural operations (including cropping and sheep grazing). One of the land use changes resulting from this consultation is that the Camp no longer conducts military training in streambeds that may be populated by the toad. Camp

¹⁵ Forest Service Manual 2670.21, as discussed in *Arroyo Southwestern Toad (Bufo microscaphus californicus) Recovery Plan* (p. 54).

¹⁶ Arroyo toads are further protected because much of the proposed critical habitat land overlaps with Forest Service wilderness areas, where roads, formal campgrounds, motorized vehicles and mountain bikes are prohibited.

¹⁷ As discussed in greater detail in the arroyo toad recovery plan, DoD Directive 4715.1 (Environmental Security) mandates that environmental factors, such as the presence of endangered or threatened species, be integrated into DoD's decision-making process (*Arroyo Southwestern Toad (Bufo microscaphus californicus) Recovery Plan*, p. 5-7).

Pendleton is now conducting a second consultation for activities on upland habitats.¹⁸

67. Because both Fort Hunter Ligget and Camp Pendleton have already consulted on activities affecting the toad, and because these consultations have already examined toad habitat, it is unlikely that critical habitat designation will require any new consultations or land use modifications. However, these military bases may expend some additional effort in determining whether all designated critical habitat areas within the boundaries of the bases contain the appropriate primary constituent elements. If reinitiations of consultations are required to address lands lacking these features, the Service believes that the informal consultation process should be sufficient to show that these lands are not appropriate critical habitat. Under such a scenario, critical habitat designation will lead to incremental administrative costs associated with the reinitiation process and costs associated with biological surveying required to determine the presence of the constituent elements.
68. The Service anticipates that project modifications at Fort Hunter Ligget or Camp Pendleton due to critical habitat designation are very unlikely. The areas of these military bases where the presence of the toad is currently not established are unlikely to contain the primary constituent elements necessary for the survival of the toad. For example, the area of Fort Hunter Ligget where the presence of the toad currently is not established is a stream section consisting of scoured bedrock and very little sand.¹⁹ As a result, future biological surveys are unlikely to locate toads in these areas, and it is unlikely that projects will require significant modification.

U.S. Fish and Wildlife Service

69. The Service manages 700 acres of land within the proposed critical habitat for the arroyo toad. This land is found within Unit 18. Because this land already is managed to protect threatened and endangered species, any land use modifications associated with the critical habitat designation for the arroyo toad are unlikely.

Bureau of Land Management

70. BLM lands comprise 9,700 acres of the proposed critical habitat, most of which is located in Unit 22 (the Whitewater River basin). Land use activities include grazing and the digging of drainage crossings for fiber optic cables.

¹⁸ U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.

²⁰ U.S. Fish and Wildlife Service staff, Ventura, CA, personal communication.

71. The Service will require BLM to consult on the toad when current grazing leases come up for renewal.²⁰ If the Service has not conducted consultations for arroyo toads in these areas in the past, critical habitat designation may lead to additional consultations and potential modification of land use, such as the installation of fencing to prevent cattle from entering streams. The cost of this modification would vary with the length of the stream and the type of fencing used.
72. If fiber optic cables are laid through arroyo toad critical habitat in the future, this activity will also require BLM to consult under section 7. However, because BLM has previously consulted with the Service for cable laying activities (e.g., trenching and tunneling), it is unlikely that the arroyo toad critical habitat designation will require any consultations beyond those that would result due to the listing of the toad.²¹

Federal Highway Authority and Federal Transportation Authority

73. All road construction projects conducted by the Federal government under the auspices of the Federal Highway Authority (FHA) or the Federal Transportation Authority (FTA) must take critical habitat considerations into account. In addition, a Federal nexus is established for any road construction project conducted by the state or county that utilizes Federal funding, or any state or county road that links to a Federal highway (e.g., via an onramp).
74. An example of a large road construction project in the proposed critical habitat area that will likely impact the arroyo toad is the Foothill Transportation Corridor. This project crosses both the San Juan and San Mateo Rivers (Units 10 and 11). Activities associated with this project may result in incidental take and also may isolate sub-populations by splitting this arroyo toad habitat in half. Throughout the southern California region, however, the FTA and FHA (the primary action agencies involved) have been consistent in consulting with the Service for activities that may affect listed species, including the arroyo toad. Consequently, Service personnel do not expect additional consultations or project design requirements because of critical habitat designation for the toad.²²

Immigration and Naturalization Service

75. Immigration control activities undertaken by the Border Patrol (part of the Immigration and Naturalization Service (INS)) potentially can affect arroyo toad habitat in Cottonwood Creek basin

²⁰ U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.

²¹ U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.

²² U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.

(Unit 19, the southernmost proposed critical habitat unit). Such activities include driving in streambeds and using bright lights (which may decrease arroyo toad breeding activities). In the past year, the Service has approached the INS to address incidental take associated with these activities. As a result, the designation of critical habitat is unlikely to lead to any new consultation or additional activity modifications beyond those associated with the listing of the arroyo toad.²³

Federal Emergency Management Agency

76. Federal Emergency Management Agency (FEMA) carries out relief efforts following natural disasters such as floods, mudslides, fires, and earthquakes. FEMA relief efforts could potentially be carried out in each of the nineteen critical habitat units. The Service recently completed a programmatic consultation with FEMA that addressed all federally listed species in southern California. The Service discussed with FEMA the types of activities the agency might engage in following a disaster and the potential impacts of those activities on listed species.
77. This programmatic consultation came about as a result of the listing of several species, including the toad. With the designation of critical habitat, there is a possibility that this programmatic consultation would need to be reinitiated in order to discuss critical habitat issues. In addition, discussions between FEMA and the Service that take place after a disaster has occurred are likely to consider critical habitat issues. However, it is unlikely that designation of critical habitat would require additional modifications to relief activities carried out by FEMA above and beyond modifications that already exist due to the listing of the toad under the Act.²⁴
78. Exhibit 4-1 summarizes effects on Federal lands and activities associated with the critical habitat designation for the arroyo toad.

²³U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.

²⁴U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.

Exhibit 4-1		
ACTIVITIES ON FEDERAL LANDS AND UNDERTAKEN BY FEDERAL AGENCIES WITHIN PROPOSED CRITICAL HABITAT FOR THE ARROYO TOAD		
Land Owner or Actor	Critical Habitat Units	Affected Activities
US Forest Service	Units 2-10, 13, and 14-21	Camping, off road vehicle use, hiking, fishing, horseback riding, mining, grazing, mountain biking and some agricultural activity in National Forests.
Department of Defense (DoD)	Units 1, 11 and 12	Military training, grazing, agriculture, recreation on Federal lands (i.e., military bases).
Bureau of Land Management (BLM)	Unit 22 Minor parts of Units 13, 17, 19, 21	Grazing; fiber optic cable digging, particularly in drainage crossings.
U.S. Fish and Wildlife Service	Unit 18	Activities on Federal (Service) lands.
Federal Highway Administration and Federal Transportation Administration	All	Federally administered, funded, or permitted road and bridge construction and maintenance.
Immigration and Naturalization Service (INS)	Unit 19	Immigration control activities (e.g. driving in river drainages) conducted by the Border Patrol.
Federal Emergency Management Agency	All	Emergency management activities conducted or funded by the Federal Emergency Management Agency.
<p>Sources: (1) <i>Arroyo Southwestern Toad (Bufo microscaphus californicus) Recovery Plan</i>, Region 1, U.S. Fish and Wildlife Service, September, 1999, (2) <i>Proposed Designation of Critical Habitat for the Arroyo Southwestern Toad</i>, U.S. Fish and Wildlife Service, June 8, 2000; (3) U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.</p>		

4.1.2 State and Local Government Lands and Activities

Water Authorities

79. Several water authorities manage reservoirs upstream from the proposed critical habitat areas for the arroyo toad. Water releases from these reservoirs that do not mimic natural patterns can lead to changes in vegetation along the banks of affected waterways, decreasing arroyo toad habitat. In addition, these releases can wash away toad larvae.
80. Several operations and maintenance activities undertaken by these water authorities may involve Federal nexuses. For example, dam operation and maintenance activities may require a Clean Water Act section 404 permit for wetland disturbance.
81. To date, the Service has undertaken consultations on projects that could potentially affect the arroyo toad at some of these water authorities. In cases where water releases are documented as having washed away arroyo toad larvae or otherwise affected arroyo toads, the Service has historically worked with these water authorities to prevent impacts on the species. Therefore, the designation of critical habitat will likely have no incremental impact on these authorities.²⁵
82. However, several of the water authorities upstream from the proposed critical habitat have not previously consulted with the Service regarding the impact of their operations on the toad. Because these reservoirs do not actually lie within the proposed critical habitat for the toad, it is not clear whether the water authorities managing those reservoirs would be subject to consultations on adverse modification of critical habitat caused by water releases. To the extent that these authorities are required to consult with the Service regarding adverse modification, consultation costs and project modifications associated with any new consultations on projects at these authorities would be attributable to the critical habitat designation.
83. The cost of these potential consultations and project modifications would vary according to the characteristics of each water authority and the characteristics of the habitat downstream of the authority. The costs associated with potential future consultations may be approximated by the costs associated with consultations that have already occurred. Sweetwater Authority, for example, has spent approximately \$54,400 in administrative and consulting costs on a combined section 7 consultation for three listed species: the arroyo toad, the least Bell's vireo, and the California gnatcatcher. Additional costs associated with this consultation have included approximately \$140,000 for the restoration of vegetation and approximately \$50,000 per year in future surveying

²⁵U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.

to monitor the three listed species.²⁶

84. Exhibit 4-2 lists water authorities managing reservoirs upstream of proposed critical habitat units and describes whether they already have consulted with the Service or may be required to do so in the future.

Exhibit 4-2			
WATER AUTHORITIES MANAGING RESERVOIRS LOCATED ON OR NEAR PROPOSED CRITICAL HABITAT FOR THE ARROYO TOAD AND ASSOCIATED FEDERAL NEXUSES			
Water Authority (Reservoirs Potentially Affecting Arroyo Toad Habitat)	Critical Habitat Units	Existing Federal Nexus	Potential Federal Nexus
Authorities Already Consulting with the Fish and Wildlife Service for the Arroyo Toad			
Montecito Water District (Jameson Lake)	Unit 3	Forest Service (diverted water from FS lands)	Section 404 Permit, Army Corps (e.g., changing dam height or other construction requiring a permit)
Camp Pendleton (O'Neill Lake)	Unit 12	Federal Lands	Section 404 Permit, Army Corps
Sweetwater Authority (Loveland Reservoir)	Unit 18	Section 10 Permit, USFWS	Section 404 Permit, Army Corps
Authorities Potentially Impacted by Critical Habitat Designation for the Arroyo Toad			
Castaic Water District (Pyramid and Castaic Lakes)	Units 5 and 6	None	Section 404 Permit, Army Corps
Los Angeles Dept. of Public Works (Big Tujunga Reservoir)	Unit 7	None	Section 404 Permit, Army Corps
Vista Irrigation District (Lake Henshaw)	Unit 16	None	Section 404 Permit, Army Corps
City of San Diego (Lake Sutherland, El Capitan Reservoir, Morena Reservoir)	Units 16, 17 and 19	None	Section 404 Permit, Army Corps
Helix Water District (Lake Cuyamaca)	Unit 17	None	Section 404 Permit, Army Corps
Other Water Districts (Lake Hemet, Little Rock Reservoir, Silverwood Lake)	Units 9, 20 and 21	None	Section 404 Permit, Army Corps
Sources: (1) Arroyo Southwestern Toad (<i>Bufo microscaphus californicus</i>) Recovery Plan, Region 1, U.S. Fish and Wildlife Service, September, 1999; (2) U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.			

²⁷ Sweetwater Authority, Sweetwater, CA, personal communication with biologist, September 12, 2000.

Other State and Local Government Lands and Activities

85. The California state park system receives funding under section 6 of the Act for use in programs promoting the recovery of Act-listed species. Historically, the Service has not conducted consultations with state parks receiving these funds and does not anticipate exercising this nexus to initiate section 7 consultations in the event of critical habitat designation for the arroyo toad. As a result, the designation of critical habitat should have no affect on activities currently occurring at these parks.
86. However, one of these parks (San Onofre State Beach) lies on Camp Pendleton. Because it is a component of a Federally-managed area, an additional Federal nexus is established. As discussed above, Camp Pendleton has already consulted with the Service on activities occurring in San Onofre State Beach. As a result, it is unlikely that additional consultations or land activity changes will be required.²⁷
87. Federal funding of state and county road construction, or the construction of a state or county road that ties into a Federal road, establishes a nexus that enables Service consultation on these activities. As discussed above, however, additional consultations or project design changes for road construction activities because of critical habitat designation are unlikely.
88. Other state and regional lands include regional parks, watershed management areas, and city and county-owned lands. Activities in these areas may have effects on the proposed critical habitat. The City of Pasadena, for example, is concerned about the effect of the proposed critical habitat designation on its land use plans for the area around Devil's Gate Reservoir. Activities taking place on these areas, however, do not appear to be subject to a Federal nexus. As a result, it is unlikely that these areas would be impacted by the designation of critical habitat for the toad.
89. Exhibit 4-3 summarizes effects on state and local lands and activities associated with the critical habitat designation for the arroyo toad.

²⁷U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.

Exhibit 4-3		
OTHER STATE AND LOCAL GOVERNMENT LANDS AND ACTIVITIES IN PROPOSED CRITICAL HABITAT FOR THE ARROYO TOAD AND ASSOCIATED FEDERAL NEXUSES		
Land Ownership or Management (Affected Activities)	Critical Habitat Units	Federal Nexus
San Onofre State Beach (Camping)	Unit 11	Beach lies on Federal lands (Camp Pendleton military base).
All Other State Parks (Camping, ORVs, hiking, fishing, horseback riding, mountain biking)	Units 11, 18 and 21	Federal funding for species protection via section 6 of the Act.
State and County Roads (Road and bridge construction and maintenance)	All	Federal funding/permitting under FHA/FTA; section 404 permit, Army Corps of Engineers.
Regional Parks, Watershed Management Land, Other City and County Public Lands (Grazing, agriculture, ORVs)	Units 7, 10, 16, 18 and 19	None.
Sources: (1) <i>Arroyo Southwestern Toad (Bufo microscaphus californicus) Recovery Plan</i> , Region 1, U.S. Fish and Wildlife Service, September, 1999; (2) <i>Proposed Designation of Critical Habitat for the Arroyo Southwestern Toad</i> , U.S. Fish and Wildlife Service, June 8, 2000; (3) U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.		

4.1.3 Private Lands

90. Many activities on private lands that often have a Federal nexus, such as residential and commercial development, mining, recreation, agriculture, and ranching, may be affected by the critical habitat designation. These potential impacts are discussed further below.

Development

91. Significant development activity is occurring or is likely to occur in many of the proposed critical habitat areas for the arroyo toad. The following section discusses the potential for new or expanded consultations in areas expected to undergo significant development.

92. Because the Service considers all of the critical habitat units to be occupied by the toad, any future projects with a Federal nexus would probably exceed the “may affect” threshold, and therefore

require at least informal consultation, even in the absence of a critical habitat designation. Without critical habitat designation (and assuming no other listed species or critical habitat are affected by the proposed action), Action agencies would most likely not have to enter into formal consultation with the Service if the results of a biological survey did not indicate the presence of toads. However, given a critical habitat designation, projects with a Federal nexus would be required to conduct a formal consultation even if a biological survey identified no toads if the action is likely to adversely affect the critical habitat. As a result, future development projects could be subject to increased consultation costs as well as potential project modifications that would not have occurred in the absence of critical habitat designation.

93. In the past, modifications for development projects affecting the arroyo toad have included requiring that any temporary roads be gravel rather than dirt (arroyo toads like to burrow in the dirt and, as a result, often get run over), requiring that construction equipment be laid out in previously used areas, and requiring that information be provided to employees about work practices that would protect the toad and its habitat. The costs of such minor modifications are likely to be small relative to the overall costs of the project and to the requirements imposed by pre-existing regulations.
94. In some cases, more expensive project modifications may be required, including the installation of fencing along streams or the removal of exotic species. However, these more expensive modifications are more likely to be required in situations where toads are present, so that the costs associated with such modifications would typically be due to the listing.

Sisquoc River (Unit 2)

95. The privately-owned stretch of the Sisquoc River proposed as critical habitat includes approximately 19,000 acres, composing 67 percent of the unit. Land in this area is primarily used for ranching and agriculture. However, the likelihood of future development in this unit may be inferred from development pressure in surrounding areas. Between 1990 and 2000, the number of detached housing units in the city of Santa Maria, just off the western edge of this unit, grew by 13 percent (see Exhibit 2-6).²⁸ This rate is almost twice that seen in Santa Barbara county as a whole (see Exhibit 2-5), and may indicate significant future urban development pressure in and around this proposed critical habitat unit. For example, lands belonging to Newhall Land and Farming, a historic agricultural landowner, is now slated for development. Because any large development

²⁸ Throughout this report, the rate of growth for detached housing units, rather than all housing units is considered. This is because detached unit growth is believed to be most indicative of the development in the suburban fringe that overlaps with proposed critical habitat lands. Another type of development common in these areas are golf courses. If built in the stream terrace, golf courses can affect the toad via both habitat degradation and fertilizer/pesticide runoff.

projects proposed for the stream terrace or other riparian habitat will require an Army Corps section 404 permit, many of these projects will have a Federal nexus.

San Francisquito Creek (Unit 6)

96. The lower third of San Francisquito Creek, which includes Los Angeles county and Santa Clarita city lands, lies in a quickly developing area. Although the number of detached housing units in Los Angeles County as a whole has only grown by 3.3 percent since 1990, the growth rate in Santa Clarita during this same period has been 30.1 percent, almost ten times faster than the county average.
97. Regional development pressures in this area are reflected in the City of Santa Clarita General Plan, which shows that lands along San Francisquito Creek are zoned as residential up to the National Forest border. In particular, the following City of Santa Clarita and Los Angeles County development projects lining the San Francisquito are pending or have already been recorded.²⁹
- ! City Project 44831, Newhall Land and Farming Co., 1200 Units, 297 acres.
 - ! City Project 52677, Newhall Land and Farming Co., 700 Units, 91 acres.
 - ! County Project 88280, Seco Canyon Development, 300 residential units, 133 acres.
 - ! County Project 88321, Valencia Co., 700 residential units, 361 acres.
 - ! County Project 92074, J Blak, 1,600 residential units, 1,795 acres.
 - ! County Project 98008, Valencia Co., 4,200 residential units, 966 acres.
98. Development in this critical habitat unit is concentrated in the areas lining the San Francisquito Creek and the Santa Clara River because of city and county hillside ordinances (established for aesthetic reasons to maintain open space on the hillsides), earthquake fault considerations, and the rapid decrease in other available open space.³⁰ The Valencia Company, which is proposing several development projects in this area, has already approached the Service about

²⁹ Pending projects have not yet gone before the planning commission. Recorded developments may already be under construction. ("Planned Growth in the Santa Clarita Valley; Santa Clarita 2000 and Beyond: Your Community, Your Future" *The Santa Clarita Signal*, March 24, 2000.)

³⁰ In general, developers prefer to build away from streambeds because of the increased number of permits needed for such developments, including those required from the Army Corps of Engineers. The rate of development along these streambeds likely indicates that other, more eligible lands, are quickly becoming scarce. (City of Santa Clarita Planning Department, personal communication Planner, June 23, 2000.)

conducting section 7 consultations because of the proposed critical habitat designation.³¹ Because Unit 6 overlaps with proposed gnatcatcher critical habitat, a formal consultation may have been required for that listed species regardless of critical habitat designation for the arroyo toad.

Below Tujunga Dam (Unit 7a)

99. Little future development is expected on the Tujunga River downstream of the Big Tujunga Dam, because little land is available for development. As is visible from aerial photos, lands just downstream of Hansen Lake (to the west of the unit) are already developed. Just northwest of the western edge of this unit lies the city of San Fernando. A comparison of 1990 and 2000 housing rates in San Fernando shows that the area has not grown appreciably during this period. In fact, the number of detached housing units in San Fernando has *fallen* by almost two percent during this period (see Exhibit 2-6), although the similar statistic for all housing units has risen by 3.4 percent.³² Thus, compared to other regions in southern California, this area is not growing at a significant rate.

100. Because little of the land in Unit 7a is available for development or for other land uses potentially affecting the toad, it is unlikely that there will be additional consultations for activities in this area.³³ In addition, before concurring that a proposed project will have no effect on the arroyo toad, the Service must determine that the proposed activities will not affect toad populations in areas outside the project boundaries (e.g., downstream). Because this stretch lies at the downstream end of Unit 7, activities are less likely to create downstream impacts for the toad, which could prompt formal consultations or project modifications.

Santiago Creek (Unit 8)

101. The Santiago Creek proposed critical habitat unit lies almost exclusively on private land. Aerial photos suggest that this area currently is completely undeveloped. Service staff confirm that they have not consulted on any projects in the recent past in this stretch of the Santiago River.³⁴ However, the Irvine Company owns most of Unit 8 and intends to develop these lands. As a result,

³¹U.S. Fish and Wildlife Service staff, Ventura, CA, personal communication.

³²State of California, Department of Finance, *City/County Population and Housing Estimates 1991-2000, with 1990 Census Counts*, Sacramento, CA, May 2000.

³³U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.

³⁴U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.

the company conducted a survey for arroyo toads during the last year. The results of this survey have not yet been submitted to the Service.³⁵

102. A potential increase in construction activity in the area is suggested not only by documented planned development but also by nearby land uses. Although undeveloped, private lands within Unit 8 are surrounded by development on all sides except the southeast. In Orange, just to the west of Unit 8, the number of detached housing units has grown by 15.4 percent over the past ten years; similarly, Yorba Linda, just north of the unit, has grown by 10 percent; and Irvine, to the southwest, has grown by 22.4 percent (see Exhibit 2-6). From aerial photos it appears that existing development ends at the edge of the hill range in which Unit 8 is enclosed. It seems likely that development pressures will continue in this area.

San Jacinto River and Bautista Creek (Unit 9)

103. Private lands constitute approximately 8,200 acres of this unit, including private inholdings in the National Forest. Unit 9 is mostly rural, but the area appears to be developing quickly. Over the past ten years, the number of detached housing units in the town of San Jacinto, just to the northwest of the unit, has grown by 75 percent (see Exhibit 2-6). During the same time, the number of detached housing units in Hemet, just to the west of the unit, has grown by 70 percent. This regional trend is corroborated by aerial photos, which show that the northwestern-most end of the unit is already developing, with development stretching west along Route 74 (running along the San Jacinto River).

Below El Capitan Reservoir (Unit 17)

104. The majority of the proposed critical habitat lands below the El Capitan Reservoir lie on private lands (including all of Subunit 17c and part of Subunit 17b). Several projects currently are underway in this stretch, including a large golf course at the base of the dam. During informal consultation for this project, a biological survey yielded no arroyo toads.
105. Aerial photos also show that Unit 17c is already developing along the San Diego River. Housing development rates in this area, however, appear to be slower than those discussed above. In the town of Santee, just to the west of this area, the number of detached housing units has only grown by nine percent since 1990. Nonetheless, Unit 17c may make up the developing edge of this

³⁵ The Service has learned that no toads were found during this survey. However, arroyo toads have had a difficult year due to weather conditions. Therefore, the Service is not clear whether the results of this survey provide conclusive evidence of the presence or absence of toads in the area.

region.

106. Because Unit 17 overlaps with proposed gnatcatcher critical habitat, a formal consultation may have been required for that listed species regardless of critical habitat designation for the arroyo toad.

Below Little Rock Reservoir (Unit 20)

107. The northern half of Subunit 20a is privately owned. Aerial maps of this region show Unit 20a to be fairly undeveloped. Areas just north of the northern boundary of subunit 20a, however, are already developed or developing. Since 1990, the number of detached housing units in the city of Palmdale, which lies north of Subunit 20a, has grown by almost 25 percent. Although this statistic is not yet likely to be representative of the private lands included in Subunit 20a, it may represent an ongoing trend in this area as the population of southern California continues to grow. Furthermore, the popularity of the surrounding Angeles National Forest as a recreation area may draw residents to this region.

Northern Mojave River Stretch (Unit 21)

108. The northern half of the Mojave River critical habitat unit runs through the center of a fairly urbanized area. To the west of Interstate 15, the city of Victorville is fairly industrial. Throughout Victorville and Apple Valley, significant residential development has taken place over the past fifteen years.³⁶ Since 1990, the number of detached housing units in Apple Valley has grown by 23 percent, while the number of units in Victorville has grown by almost 67 percent (see Exhibit 2-6). Thus, significant urban development is likely to continue along the Mojave River, and those projects requiring permits from the Army Corps of Engineers or other Federal agencies will have a Federal nexus.

Sand and Gravel Mining

109. Sand and gravel and placer mining generally occur in streambed areas and therefore fall under the jurisdiction of the Army Corps of Engineers. Mining activities are especially prevalent in the Sisquoc, Piru, San Juan, Santa Margarita, San Luis Rey and Sweetwater River basins (Units 2, 5, 10, 13, 14 and 18 respectively). Past mining activities with an Army Corps nexus in the proposed critical habitat areas for the arroyo toad have required at least informal consultations with the Service concerning the toad. If biological surveys found no toads, however, formal consultations were not

³⁶U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.

required.

- 110. Once critical habitat is designated, however, formal consultation for the arroyo toad will be required for all mining activities with a Federal nexus. As a result, some of these projects could be subject to incremental consultation and project modification costs.
- 111. In the past, modifications for mining activities affecting the toad have included requiring that information be provided to employees about work practices that would protect the toad and its habitat, requiring that streams be restored to conditions suitable for the toad, and requiring that shallow pools of water (which attract breeding toads) be filled after each day of mining. However, such modifications have in the past only been required in situations where toads are present, so that the costs associated with such modifications would typically be due to the listing.
- 112. In addition, both the Piru and the San Juan rivers have been classified by the California Department of Fish and Game (CDFG) as Class A, therefore restricting these rivers to all dredging (including in river mining) activities. Because mining activities along both these two rivers and the other Class A rivers listed in Exhibit 2-4 are already prohibited because of CDFG restrictions, it is unlikely that there will be additional restrictions on land uses in these stretches due to critical habitat designation.

Farming and Grazing

- 113. There are a number of agricultural activities could affect the proposed critical habitat for the arroyo toad. These include ranching and various types of cropping (including vineyards). Federal farming subsidies would constitute a Federal nexus for both farming and grazing in the proposed critical habitat. Currently, the Service has not required consultations for either farming or grazing on private lands. As a result, the designation of critical habitat is not expected to have an effect on these activities.
- 114. Exhibit 4-4 summarizes activities of private landowners in the proposed critical habitat area for the arroyo toad.

Exhibit 4-4		
ACTIVITIES OF PRIVATE LANDOWNERS IN PROPOSED CRITICAL HABITAT FOR THE ARROYO TOAD AND ASSOCIATED FEDERAL NEXUSES		
Land Ownership or Management (Affected Activities)	Critical Habitat Units	Federal Nexus

Urban development (e.g., Major construction projects, golf courses)	Most	Section 404 permit, Army Corps; Funding under Fannie Mae or Freddie Mac
Sand and Gravel Mining	Many	Section 404 permit, Army Corps
Cropping	Many, including Units 2, 6, 8 and 12-15	Farmers often receive Federal subsidies under the Farm Bill; Vineyards may have an Army Corps nexus if they conduct activities along water courses (e.g., bank stabilization)
Grazing (Grazing on private lands)	Some	Ranchers often receive Federal subsidies under the Farm Bill.
Sources: (1) <i>Arroyo Southwestern Toad (Bufo microscaphus californicus) Recovery Plan</i> , Region 1, U.S. Fish and Wildlife Service, September, 1999; (2) Proposed Designation of Critical Habitat for the Arroyo Southwestern Toad, U.S. Fish and Wildlife Service, June 8, 2000; (3) U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.		

4.1.4 Tribal Lands

115. The designation of arroyo toad critical habitat may lead to incremental costs for activities occurring on Tribal lands. Portions of eight Indian Reservations, consisting of 8,475 acres, have been proposed for designation. Because the Bureau of Land Management (BLM) and the Bureau of Indian Affairs (BIA) have oversight over many activities occurring on Tribal lands, a Federal nexus is more likely to occur on Tribal lands than on other non-Federal lands. Most of those activities currently taking place on proposed critical habitat lands, including mining and other construction, already have a nexus through either the BLM, BIA, or the Army Corps.
116. Because the Service believes that all critical habitat units are occupied by the toad, any future projects with a Federal nexus would probably exceed the “may affect” threshold, and therefore require at least informal consultation, even in the absence of a critical habitat designation. Without critical habitat designation (and assuming no other listed species or critical habitat are affected by the proposed action), Action agencies would most likely not have to enter into formal consultation with the Service if the results of a biological survey did not indicate the presence of toads. However, given a critical habitat designation, projects with a Federal nexus would be required to conduct a formal consultation even if a biological survey identified no toads if the action is likely to adversely affect the critical habitat. As a result, future development projects could be subject to increased consultation costs as well as potential project modifications that would not have occurred in the absence of critical habitat designation.
117. Both the Rincon Indian Reservation (Unit 14) and the Barona Indian Reservation (Unit 17) fall on the edges of proposed critical habitat. In fact, in the rule proposing critical habitat designation, the Service states:

"Approximately 190 acres of the Barona Indian Reservation south of San Vicente Creek are also included in this unit. These acres are not considered high-quality arroyo toad habitat; they lie within the unit boundary because of the spatial scale at which these units were mapped. Thus, Tribal lands on the Barona Indian Reservation are not considered essential to conserve the toad and are not being proposed for critical habitat."³⁷

118. Based on this statement, it is unlikely that activities with a Federal nexus on the Barona Indian Reservation will be required to consult due to the arroyo toad critical habitat designation. However, even if Rincon Tribal lands similarly lack the primary constituent elements for toad habitat, an informal consultation and accompanying biological assessment may be necessary to distinguish this. In this case, critical habitat designation will lead to the incremental costs associated with this informal consultation and assessment.

³⁷ *Proposed Designation of Critical Habitat for the Arroyo Southwestern Toad*, 65 FR 36512, June 8, 2000.

119. Exhibit 4-5 summarizes tribal activities on proposed critical habitat areas for the arroyo toad.

Exhibit 4-5			
ACTIVITIES OF TRIBAL LANDOWNERS IN PROPOSED CRITICAL HABITAT FOR THE ARROYO TOAD AND ASSOCIATED FEDERAL NEXUSES			
Land Ownership or Management (Affected Activities)	Critical Habitat Units	Federal Nexus	Notes
Development	Units 9, 14, 17, 18 and 19	Section 404 permit, Army Corps; Bureau of Indian Affairs (BIA)	Future tribal regulations will be considered
Sand and Gravel Mining	Units 14 and 19	BLM, section 404, Army Corps	BLM ensures compliance.
Sources: (1) <i>Arroyo Southwestern Toad (Bufo microscaphus californicus) Recovery Plan</i> , Region 1, U.S. Fish and Wildlife Service, September, 1999; (2) Proposed Designation of Critical Habitat for the Arroyo Southwestern Toad, U.S. Fish and Wildlife Service, June 8, 2000; (3) U.S. Fish and Wildlife Service staff, Carlsbad, CA, personal communication.			

4.2 SUMMARY OF CONSULTATION COSTS DUE TO CRITICAL HABITAT

120. This subsection summarizes the costs of incremental administrative effort devoted to section 7 consultations as a result of critical habitat designation. Using the level of effort involved in past consultations as a guide, quantitative estimates of the costs associated with these incremental consultations are provided.

121. To estimate the number of incremental formal consultations due to critical habitat, this analysis relies on the professional judgement of Service personnel. For the proposed critical habitat area, Service staff at the Ventura, CA, and Carlsbad, CA, field offices provided estimates of the number of incremental formal consultations due to critical habitat over the next ten years. In developing these estimates, Service staff considered the potential presence of other listed species, land ownership, the likelihood of a Federal nexus, and the amount of land within each unit where the presence of the toad is not currently established. The estimates of the number of incremental consultations presented in Exhibit 4-6 are considered by the Service to be suggestive. The actual number of incremental consultations may be lower or higher than these estimates and will vary depending on future economic growth within the region, as well as the decisions of private, state, local, and Federal landowners.

122. The consultation cost estimates were developed through a review of consultation files from the Carlsbad, CA, field office.³⁸ In developing the estimates, the level of effort of the Service, the Action agency, and the applicant during both formal and informal consultations was considered. Costs associated with these consultations include preparation of a biological assessment as well as the costs of the consultation itself (e.g., time spent in meetings, preparing letters, development of biological opinion).

123. As shown in Exhibit 4-6, the Service estimates that a total of 28 new consultations will occur as a result of the designation of critical habitat. The total incremental costs range from \$319,200 to \$515,200. The analysis results show that these costs are equally distributed between the Pacific mid-coast and Southern California.

Exhibit 4-6			
Incremental Costs Due to Critical Habitat Designation			
Critical Habitat Region	Estimated Number of Incremental Consultations Due to Critical Habitat Designation (2000-2010)	Lower range estimate of consultation costs	Upper range estimate of consultation costs
Pacific mid-coast area	14	\$159,600	\$257,600
Southern California area	14	\$159,600	\$257,600
Total	28	\$319,200	\$515,200

Sources: Incremental consultation estimates based on data obtained from U.S. Fish and Wildlife staff, Carlsbad, CA, and Ventura, CA. Cost estimates obtained from internal IEc analysis.

³⁸ Frequently, section 7 consultations address the potential for impacts to several listed species at once rather than to a single species. The cost estimates above attribute all of the incremental administrative costs to a single species and therefore may overestimate the true costs associated with critical habitat designation for the toad.

4.3 ADDITIONAL IMPACTS DUE TO CRITICAL HABITAT

124. This section considers additional economic and socioeconomic impacts of designating critical habitat for the arroyo toad. Specifically, this section addresses:
- ! Potential impacts to small businesses;
 - ! Potential impacts associated with litigation costs and project delays; and,
 - ! Potential impacts associated with changes in property values attributable to public perceptions and/or uncertainty about proposed critical habitat.

4.3.1 Potential Impacts to Small Businesses

125. Under the Regulatory Flexibility Act (as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996) whenever a Federal agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).³⁹ However, no regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.
126. Small businesses in the construction industry and the sand and gravel mining industry could potentially be affected by the designation of critical habitat for the arroyo toad. Exhibit 4-7 lists the number of small construction and mining establishments in each of the nine counties. As shown, most construction and mining establishments have fewer than 20 employees. Although these data reflect county-wide statistics, it is likely that the majority of construction and mining establishments operating in those areas potentially affected by critical habitat designation are also small.

³⁹ 5 U.S.C. 601 et seq.

Exhibit 4-7							
SMALL BUSINESSES IN THE MINING AND CONSTRUCTION INDUSTRIES							
County	Total Number of Establishments in County (e)	Industry	Total Employees per Industry	Annual Payroll per Industry (\$1,000s)	Total Establishments per Industry	1-19 Employees	20-99 Employees
Monterey	8,457	Mining (all)	133	6,130	11	8	3
		Sand & Gravel*	(b)	(d)	2	2	0
		Construction (all)	5,204	181,554	833	774	57
		Residential Const.	1,137	32,545	294	284	10
San Luis Obispo	6,557	Mining (all)	76	2,242	10	9	1
		Sand & Gravel*	(a)	(d)	1	1	0
		Construction (all)	4,588	132,730	829	780	49
		Residential Const.	840	18,935	222	215	7
Santa Barbara	10,535	Mining (all)	966	40,093	34	27	5
		Sand & Gravel*	(b)	(d)	2	2	0
		Construction (all)	7,265	253,922	1,011	948	57
		Residential Const.	1,093	31,569	264	256	8
Ventura	16,463	Mining (all)	553	28,652	49	40	9
		Sand & Gravel*	(c)	(d)	5	3	2
		Construction (all)	13,170	431,696	1,698	1560	128
		Residential Const.	1,296	39,204	337	326	11
Los Angeles	219,933	Mining (all)	2,942	152,293	153	119	28
		Sand & Gravel*	365	26,869	21	15	6
		Construction (all)	119,985	4,291,240	12,057	10,732	1,178
		Residential Const.	15,561	450,032	2,821	2,675	134

Exhibit 4-7							
SMALL BUSINESSES IN THE MINING AND CONSTRUCTION INDUSTRIES							
County	Total Number of Establishments in County (e)	Industry	Total Employees per Industry	Annual Payroll per Industry (\$1,000s)	Total Establishments per Industry	1-19 Employees	20-99 Employees
San Bernardino	26,132	Mining (all)	1,080	57,568	42	33	5
		Sand & Gravel*	(c)	(d)	12	9	3
		Construction (all)	28,503	899,339	2,661	2,334	292
		Residential Const.	2,649	86,815	459	444	11
Riverside	24,817	Mining (all)	489	23,351	25	19	5
		Sand & Gravel*	(c)	(d)	12	8	4
		Construction (all)	36,313	1,176,593	3,033	2,640	340
		Residential Const.	3,611	113,002	530	502	22
Orange	75,154	Mining (all)	616	27,552	58	49	9
		Sand & Gravel*	(c)	(d)	1	0	1
		Construction (all)	70,674	2,630,265	5,838	5,009	719
		Residential Const.	7,632	319,716	1,065	994	60
San Diego	64,413	Mining (all)	698	33,455	49	42	6
		Sand & Gravel*	437	21,463	15	12	2
		Construction (all)	63,611	2,124,292	5,432	4,733	612
		Residential Const.	10,642	304,126	1,160	1,078	73
Notes: *Construction sand and gravel mining. (a) 0 to 19 employees; (b) 20 to 99 employees; (c) 100 to 249 employees; (d) Data withheld to avoid disclosing data for individual companies. (e) A business can consist of several establishments, so the number-of-establishments figures are likely to overstate the true number of small businesses.							
Source: 1998 County Business Patterns Economic Profiles, U.S. Census Bureau.							

127. If critical habitat designation for the arroyo toad leads to significant project modifications or delays associated with development, small construction businesses may be affected. However, as discussed in Section 3, any project modifications associated with construction activities are likely to be relatively minor and, as a result, economic impacts to small businesses in the construction industry are likely to represent a small proportion of the overall costs of the project and of the overall

regulatory burden.

128. Another group of small businesses whose activities may affect the toad are mining operations, especially sand and gravel mining. Mining is a significant land use in some areas of designated critical habitat, including the area along the Sisquoc River (Unit 2). Because some businesses involved in mining activities in the past have not been required to formally consult with the Service on the arroyo toad, critical habitat designation may require new or incremental consultations and project modifications for these and other businesses involved in mining activities. However, sand and gravel mining is already subject to regulations under CEQA and California's Department of Fish and Game. The incremental impacts due to critical habitat designation are likely to be small given these existing regulatory restrictions.
129. A final group of small businesses that may be affected by critical habitat designation is farmers and ranchers. In the past, the Service has not consulted on farming and grazing activities on private land. However, the Service will consult on grazing when current BLM grazing leases come up for renewal. As a result, ranchers leasing BLM land may incur incremental costs associated with consultations and project modifications (such as the installation of fencing).

4.3.2 Potential Impacts Associated with Project Delays, Litigation and Property Values

130. Landowners with property within the proposed designation may be uncertain about whether their property constitutes critical habitat. Some landowners may therefore elect to retain or consult counsel, surveyors, and other specialists to determine whether their land lies within critical habitat boundaries and/or whether the primary constituent elements are present. Even if these lands are found not to lie within critical habitat, or, if within critical habitat, no consultations are necessary, uncertainty over the critical habitat status has the potential to create real economic costs as landowners act to reduce and/or mitigate the effects of this uncertainty.
131. Another potential effect of critical habitat designation may be changes in property values. As discussed previously, even for those lands where no impacts are anticipated, property values may change. Such property value effects may be both positive and negative. For example, several property owners who attended the arroyo toad critical habitat public hearings stated that the designation will increase property values by slowing surrounding development.⁴⁰ This perception may result in real increases in land values. Over time, as the public becomes aware that critical habitat is

⁴⁰ U.S. Department of the Interior, U.S. Fish and Wildlife Service, Public Hearing Regarding a Proposal to Designate Critical Habitat for the Endangered Arroyo Toad, Valencia, CA, Tuesday, June 27, 2000.

not likely to appreciably slow development, the impact of the designation on property markets will likely decrease, coming into alignment with any true changes in development rates.⁴¹

132. Critical habitat designation may also *decrease* the perceived value of lands yet to be developed. Portions of the land area proposed for arroyo toad critical habitat are currently being developed or are likely to be developed soon. Much of this land has historically been used for agriculture or grazing. If prospective buyers believe that critical habitat designation lowers the value of these lands, current landowners (land management firms as well as farmers and ranchers) may suffer a loss in property value. But, similar to above, as developers become aware of what modifications are truly likely to be required because of the designation, this impact will be expected to decrease with time.
133. The proposed designation may also lead to increases in third party lawsuits against those entities conducting projects within critical habitat, even in cases where all Service requirements are met or no Federal nexus exists. That is, the existence of critical habitat may provide another means for third parties to slow or stop projects they oppose. Even if such suits are eventually dismissed, those being sued will be required to carry the administrative and legal costs associated with defending their activities. Defendants may range from city governments engaged in infrastructure development to support new development (e.g., roads, bridges and sewers), to developers, mining companies, individual homeowners, farmers, and ranchers.
134. A final cost potentially incurred because of critical habitat designation stems from delays associated with the section 7 consultation process. Both public and private entities may experience delays in projects and other activities due to critical habitat designation. Regardless of funding (i.e., private or public), projects and activities are generally undertaken only when the benefits exceed the costs, given an expected project schedule. If costs increase, benefits decrease, or the schedule is delayed, a project or activity may no longer have positive benefits, or it may be less attractive to the entity funding the project.
135. For example, if a private business undertaking a residential development must delay groundbreaking as result of an unresolved section 7 consultation, the developer may incur additional financing costs. Delays in public projects, such as construction of a new park, may impose costs in the form of lost recreational opportunities. The magnitude of these costs of delay will depend on the specific attributes of the project, and the seriousness of the delay.
136. Costs associated with delays driven by critical habitat designation will primarily be limited to those formal section 7 consultations that would not have been necessary before the designation. In

⁴¹ This statement assumes that most development projects will continue despite any incremental costs associated with critical habitat-triggered section 7 consultations.

cases where formal consultations were already required – because the project areas were occupied by the arroyo toad or by other listed species – critical habitat designation should only lead to incremental delays. In either case, however, the magnitude of such delays is unclear: the formal consultation process may add significantly to time lags before groundbreaking, or the Action agency and the individual organization initiating the activity may be able to conduct a section 7 consultation simultaneously with other necessary permitting processes, thus leading to no additional delays.

FURTHER REFERENCES

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