

**ADDENDUM TO
ECONOMIC ANALYSIS OF
CRITICAL HABITAT DESIGNATION
FOR THE SAN BERNARDINO KANGAROO RAT**

DRAFT

March 2002

INTRODUCTION

In December 2000, the U.S. Fish and Wildlife Service (the Service) proposed designation of critical habitat under the Endangered Species Act of 1973, as amended (the Act) for the San Bernardino kangaroo rat (*Dipodomys merriami parvus*). This proposal encompasses approximately 55,400 acres in San Bernardino and Riverside counties, California. Because the Act requires an economic analysis of the critical habitat designation, the Service released a *Draft Economic Analysis of Critical Habitat Designation for the San Bernardino Kangaroo Rat* (hereafter DEA) for public review and comment in August 2001.¹

The primary purpose of this Addendum is to update the DEA. As such, the Addendum revisits the assumptions and analytic conclusions presented in the DEA in light of new information obtained since the DEA was published. It also addresses some of the issues raised in public comments to the DEA.

EXECUTIVE SUMMARY OF REVISIONS

Exhibit Add-1 provides a summary of estimated Section 7-related costs, as presented in the DEA and as revised in this Addendum. As shown, the revised cost estimates are, in many cases, substantially higher than those presented in the DEA. Specifically, the revised estimate of total Section 7-related costs is between \$77 million and \$456 million, over a ten-year period. Costs are presented in Exhibit Add-1 in three categories: all Section 7 costs, except for those associated with significant project modifications; significant project modification costs; and costs associated with requirements within California Environmental Quality Act (CEQA) triggered by the critical habitat designation for the San Bernardino kangaroo rat (kangaroo rat). Specific changes include:

- Section 7 costs, excluding costs associated with *significant* project modifications, increase primarily as a result of higher estimated costs for *typical* project modifications (see Section 4 of this addendum).
- The estimated costs of *significant* project modifications increase for three reasons. First, the low end estimate of alternate water supply sources has been adjusted to incorporate information regarding the price of water available from the California State Water Project. Second, the high end estimate of alternative water sources is based on the use of a new case study, reflecting the Seven Oaks Dam project. Finally, costs associated with residential, commercial, and industrial development have been adjusted based on new information regarding the potential reduction in the value of land in areas of the proposed critical habitat designation that are likely to be affected by *significant* project modifications.

¹ Copies of the *Draft Economic Analysis of Critical Habitat Designation for the San Bernardino Kangaroo Rat* are available by writing to the Field Supervisor, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, 2730 Loker Avenue, Carlsbad, CA 92008.

- Costs associated with CEQA requirements triggered by critical habitat designation increase slightly as a result of additional information regarding the number of projects that could potentially be affected by the designation (see Section 4.7).

Exhibit Add-1				
ESTIMATED SECTION 7-RELATED COSTS FOR THE SAN BERNARDINO KANGAROO RAT				
(ten year total)				
Cost Category	Scenario	Original DEA Cost Estimate	Revised Cost Estimate	Primary Reason for Revision
Section 7 Costs				
Direct Section 7 costs (without <i>significant</i> project modification costs)	Low	\$11,868,000	\$23,262,000	Increases in assumed <i>typical</i> project modification cost
	High	\$49,090,000	\$147,507,000	
<i>Significant</i> project modification costs	Low	\$657,000	\$52,296,000	Use of the Seven Oaks Dam case study and new information about local property values
	High	\$14,251,000	\$296,248,000	
Secondary costs associated with California Environmental Quality Act (CEQA)	Low	\$2,200,000	\$2,200,000	Increase in the number of projects that could potentially be affected by the proposed critical habitat designation
	High	\$11,200,000	\$11,300,000	
Total costs	Low	\$14,725,000	\$77,758,000	Increase in assumed <i>significant</i> project modification costs
	High	\$74,541,000	\$455,055,000	

Exhibit Add-2 provides a summary of the estimated economic costs that will be attributable to critical habitat. Total direct costs, including significant project modifications, are higher than those reported in the DEA as a result of changes discussed in the bullets preceding this exhibit. Secondary, CEQA-related costs increase by a small amount from the DEA (see Section 4.7). As a result of these changes, the revised estimate of the total economic cost that could be associated with critical habitat designation for the kangaroo rat, independent of listing effects, is between \$15 million and \$131 million over a 10-year period.²

² It is difficult to estimate precisely which costs will be faced in which years. However, it is unlikely that these costs will all occur in the course of one year.

Exhibit Add-2				
ESTIMATED COSTS ATTRIBUTABLE TO CRITICAL HABITAT DESIGNATION FOR THE SAN BERNARDINO KANGAROO RAT (ten year total)				
Cost Category	Scenario	Original DEA Cost Estimate	Revised Cost Estimate	Primary Reason for Revision
Costs Attributable to Critical Habitat				
Direct Section 7 costs attributable to critical habitat (including <i>significant</i> project modification costs)	Low	\$2,185,000	\$13,482,000	Use of the Seven Oaks Dam case study and information local property values
	High	\$17,045,000	\$119,360,000	
Costs associated with CEQA	Low	\$2,200,000	\$2,200,000	Increase in the number of projects that could potentially be affected by the proposed critical habitat designation
	High	\$11,200,000	\$11,300,000	
Total costs	Low	\$4,385,000	\$15,682,000	Increase in assumed <i>significant</i> project modification costs
	High	\$28,245,000	\$130,660,000	

REVISIONS TO THE DRAFT ECONOMIC ANALYSIS

The following sections describe several revisions to the DEA, a number of which affect the magnitude of the expected costs of this designation. The revised estimates result from evaluation of the information provided by the public during the comment period and additional research conducted after publication of the DEA. Section numbers presented in the headers of this Addendum refer to the section numbers of the DEA.

Section 2.1 Socioeconomic Profile of the Critical Habitat Areas

The DEA provides population, employment, and other socio-economic statistics for counties and cities whose geographic boundaries overlap with the proposed designation. However, one commenter notes that these regional figures may not accurately reflect the socio-economic conditions on Tribal lands. In order to provide a more complete picture of the socio-economic conditions within the proposed critical habitat designation, this addendum provides socio-economic data specific to the Soboba Band of Luiseno Mission Indians (Soboba Tribe).

The Soboba Tribe estimates that, in the 1997 calendar year, the Soboba Reservation supported a resident service population of 732.³ Of these, 297 people were under the age of 16, 393

³ The “Resident Service Population” is the Tribe’s estimate of all American Indians and Alaska Natives, including members and non-members of the Soboba Tribe, who were living on or near the Tribe’s reservation during the calendar year.

people were between 16 and 65, and 42 people were over the age of 65. In 1997, there were 392 people on the Reservation available for work. Of these, 91 people were employed (23 percent) and 301 people were unemployed (77 percent). Of those employed, ten people were employed by public entities, and 81 people were employed by private entities.⁴

Section 2.3 Baseline Regulations

The DEA provides relevant information on regulatory requirements that exist in the baseline, i.e., the "without section 7" scenario. These regulations limit or encourage development, affect the section 7 consultation process, and/or trigger consultations even in the absence of the designation. This section expands on that discussion, by considering the requirements put in place by U.S. Department of the Interior (DOI) Secretarial Order 3206, entitled *American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act*.

DOI Secretarial Order 3206 clarifies the Service's responsibilities when actions taken under the authority of the Act affect Indian lands and Tribal trust resources.⁵ The Order requires the Service to work with Indian Tribes to promote healthy ecosystems; recognize that Indian lands are not subject to the same regulations as Federal public lands; assist Indian Tribes in managing their own resources by providing information resources and technical resources; and respect Indian culture, religion, and spirituality. Overall, Secretarial Order 3206 provides guidelines for interactions between the Service and Indian Tribes in reference to critical habitat.

The Appendix to the Order provides specific policy guidance. Section 3(C) of the Appendix states that the Service must:

- Solicit information and knowledge from affected Indian Tribes during the consultation process;
- Notify affected Tribes about Federal agency actions subject to formal section 7 consultations that might affect Tribal rights or Tribal trust resources;
- Provide copies of Biological Opinions to affected Tribes;
- When the Service enters a formal consultation with the Bureau of Indian Affairs (BIA), to treat the affected Tribe as a license or permit applicant;

⁴ U.S. Bureau of Indian Affairs, *The Indian Service Population and Labor Force Estimates Report*, 1997. Accessed at <http://www.doi.gov/bia/reports.html> on 10-21-01. These are the most up-to-date figures readily available.

⁵ Department of the Interior Secretarial Order #3206, "American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act," <http://endangered.fws.gov/tribal/Esatribe.htm>, August 29, 2000.

- Notify affected Indian Tribes and provide for participation when the Service enters into formal consultation with Federal agencies other than the BIA; and,
- In developing reasonable and prudent alternatives, give full considerations to all comments and information received from any affected Tribe. In addition, make a written determination describing (1) how the selected alternative is consistent with their trust responsibilities and (2) the extent to which Tribal conservation and management plans for affected Tribal trust resources can be incorporated into any such alternative.

In previous DOI appropriation bills, the Service was prohibited from using funds to implement specific requirements of Secretarial Order 3206. This provision does not exist in the fiscal year 2002 DOI appropriation, and thus it is reasonable to assume that implementation of these requirements will occur in the future.

It is our understanding that the Service has already begun to implement Secretarial Order 3206 by sending a letter to the Soboba Tribe spokesman on August 30, 2001. In this letter, the Service proposed to initiate a government to government consultation with the Soboba Tribe regarding the kangaroo rat. Additionally, the Service met with the Soboba Tribe in September 2001 to further discuss the kangaroo rat and proposed critical habitat. If the Service continues implementing the guidelines in Secretarial Order 3206, it is likely that it will have to expend more effort during section 7 consultations with Tribes. This effort could take the form of additional correspondence, soliciting information, additional meetings, etc. Thus, it is likely that in future consultations with the Soboba Tribe regarding the kangaroo rat, the Service will face costs similar to the high end of the consultations costs listed in Section 4 of the DEA (i.e., \$3,100 for informal consultation and \$6,000 for a formal consultation).

SECTION 3. SECTION 7 IMPACTS

(Note: The title of Section 3 in the DEA is “Critical Habitat Impacts”. This title is somewhat misleading because Section 3 of the DEA examines all of the section 7-related impacts associated with the kangaroo rat. Thus, the more accurate "Section 7 Impacts" is used in this Addendum.)

Section 3 of the DEA provides a description of the current land uses within the proposed designation, a description of potential future activities that are likely to have a Federal nexus, and the number of projects or the amount of development that is likely to occur over the next ten years within the proposed designation. Several commenters provided additional information about projects or potential development not considered in the DEA. Brief descriptions of these projects are included below.

Section 3.5.2 Soboba Indian Reservation

Approximately 1,150 acres of the Soboba Indian Reservation are proposed for designation as critical habitat. The DEA estimates that the Soboba Tribe is likely to be involved in one to two

section 7 consultations with the Service over the next ten years, related to a water percolation project and a sand mining facility. The Soboba Tribal Chairman provided additional information during the comment period regarding the Soboba Tribe's recent acquisition of land. The parcel lies adjacent to the Reservation's northwest edge and is included within unit 3 of the proposed designation. The Soboba Tribe purchased this land for the specific purpose of economic development. Portions of the land were used for agricultural purposes as recently as 1995.

It is possible that any development on this land could be subject to a section 7 consultation. Therefore, this addendum assumes that there is likely to be a total of two to three section 7 consultations with the Soboba Tribe over the next ten years (i.e., one more than is reported in the DEA). As mentioned above, the Service will likely face costs similar to the high end of the consultation costs listed in Section 4 of the DEA (i.e., \$3,100 for informal consultation and \$6,000 for a formal consultation) as a result of the policy directives of Secretarial Order 3206.

The Soboba Tribe also notes that the completion of the proposed water percolation project mentioned in the DEA may be critical to implementation of the settlement of Soboba Tribal water rights, under negotiation since 1994 with Eastern Municipal Water District, Metropolitan Water District, Lake Hemet Municipal Water District, and the U.S. government. The Tribe believes that the designation of critical habitat may adversely affect this settlement if the proposed water percolation project is not completed.

As mentioned in the DEA, the designation of critical habitat may affect water percolation and conservation projects through the section 7 consultation process and associated project modifications. The section 7 consultation may affect the timing or method in which the percolation project is carried out. However, based on past consultations, it is unlikely to halt the project altogether. Thus, it is unlikely that the implementation of the settlement of Soboba Tribal water rights will be jeopardized.

Section 3.9 Water Supply and Conservation Activities

The DEA lists a number of water supply and conservation projects that will be subject to section 7 consultation over the next ten years. Several commenters mentioned an additional project not considered in the DEA: construction and upgrading of existing wells along Tippecanoe Avenue in the San Bernardino-Santa Ana River bottom, which are owned and operated by the Gage Canal Company. The goal of the project is to capture and contain a plume of trichlorethylene contamination present in the area groundwater. The contamination is thought to originate in the Redlands area and has the potential to affect the water supply for the City of Riverside. This project will involve the construction of additional pipelines and wells necessary to capture the plume. The U.S. Army Corps of Engineers (ACOE) is likely to have jurisdiction over the project, resulting in a Federal nexus. Therefore, an additional section 7 consultation on water supply and conservation activities (in addition to the 89 to 153 range estimated in the DEA) is likely.

SECTION 4: TOTAL SECTION 7 COSTS

(Note: The title of Section 4 in the DEA is “Estimated Costs of the Designation of Critical Habitat for the Kangaroo Rat”. This title is somewhat misleading because Section 4 of the DEA examines all of the section 7-related cost associated with the kangaroo rat. Thus, the title “Total Section 7 Costs” is used here.)

Section 4.1.2 Kangaroo Rat Surveys

For certain projects and activities within the critical habitat units, a kangaroo rat survey may be necessary to identify the location of populations and primary constituent elements. The DEA assumed that these surveys would not be necessary on certain areas of the critical habitat units, because the areas may have already been surveyed by the Service or other entities. However, several commenters stated that the results of a kangaroo rat survey may only be valid for one year and thus additional surveys may be recommended in areas previously surveyed. Therefore, the assumption in the DEA that surveys would be recommended for only 70 percent of the large projects is changed to 100 percent to provide for an upper estimate of potential total costs.

Section 4.2.1 Section 7 Impacts

(Note: The title of Section 4.2.1 in the DEA is “Critical Habitat Impacts”. This title is somewhat misleading because Section 4.2.1 of the DEA examines all of the section 7-related impacts associated with the kangaroo rat. Thus the title “Section 7 Impacts” is used here.)

The DEA predicts the number of surveys and expected consultations associated with land areas contained within the proposed critical habitat designation over the next ten years. Based on the changes discussed above, Exhibit Add-3 presents revised estimates of the number of surveys and consultations expected to take place over a ten year period.

Exhibit Add-3			
REVISED NUMBER OF EXPECTED CONSULTATIONS REGARDING ACTIVITIES WITHIN DESIGNATED CRITICAL HABITAT UNITS (ten year total)			
Scenario	Number of large projects requiring technical assistance	Total section 7 consultations	Consultations with Biological Surveys
Low	265	172	172
High	422	280	280
Source: Based on GIS analyses, information on local zoning and planning requirements, and information provided by land owners and managers potentially affected by the proposed critical habitat designation as contained in public comments to the DEA.			

Exhibit Add-3 revises the estimates provided in Exhibit 4-1 of the DEA. As discussed throughout Section 3 of the DEA, the difference between the low and high scenarios primarily reflects uncertainty regarding the number of large projects (averaging 100 acres) that will be conducted within the critical habitat designation over the next ten years. The number of large projects requiring technical assistance increased by two in the low scenario and by three in the high scenario, as discussed above. The number of section 7 consultations is calculated as a percentage of the number of large projects requiring technical assistance. Thus, the number of consultations also increased in both scenarios. Due to a revised assumption about the number of section 7 consultations for which a biological survey may be recommended, the number of biological surveys increased by 53 in the low scenario and by 85 in the high scenario.

Section 4.3 Estimated Costs of Surveys, Consultations, and Technical Assistance

The DEA presents a cost estimate for a biological survey for a typical 100-acre large project. It assumes that such a survey would involve a habitat assessment, up to five nights of surveying, and the preparation of a brief report of findings. The DEA estimates the cost of a typical survey to fall between \$5,000 and \$10,000. Several commenters suggested that due to the size of the project planning area and the amount of suitable habitat, upwards of ten survey nights may be necessary to adequately survey the site. This observation was confirmed through conversations with several local biological consultants that conduct the kangaroo rat surveys.⁶ Thus, the cost of a typical survey is more likely to fall within a range of \$5,000 to \$15,000. This higher estimate is used in the calculation of total economic costs later in this addendum.

The DEA also presents a range of costs for private applicants, Federal agencies, and the Service to conduct a section 7 consultation. Included in this range is the cost of conducting a habitat

⁶ Personal communication with Senior Biologists at Tetra Tech, Inc., San Bernardino CA, on October 22, 2001 and SJM Biological Consultants, San Diego CA, on October 21, 2001.

assessment. The DEA uses a range of \$1,000 to \$5,600 for a habitat assessment of a typical 100-acre project. Conversations with local biological consultants indicate that a habitat assessment costs between \$2,000 and \$5,600.⁷ This new range is used in the calculation of total economic costs later in this addendum.

Section 4.4 Estimated Costs of Project Modifications

The DEA provides the results of an analysis of all of the historical formal consultations that included the kangaroo rat. Based on this analysis, six *typical* project modifications and several *significant*, but less common modifications were identified. The *typical* project modifications include conservation measures, presence of a biological monitor, education programs, habitat restoration and enhancement, long term monitoring, and project plan alterations. The costs of these types of project modifications are discussed in detail in this section. Examples of possible *significant* project modifications include alternate sources for water supply, alternate project sites, and projects that are not completed. Cost estimates for these types of project modifications are provided in the next section, called “Section 4.4.1, *Significant* Project Modifications and Delays.”

Cost Estimates for *Typical* Project Modifications

Several commenters suggest that the range of cost estimates provided in the DEA does not accurately reflect the actual costs project managers and land owners are likely to face over the next ten years. In response to these comments, additional research on the costs of biological consulting services in the region was conducted.⁸ Specifically, biological consultants were interviewed to obtain information on the range of costs for each of the following elements for a typical 100-acre project. The results of this research is summarized below.

- **Conservation Measures.** The DEA states that during a section 7 consultation on a typical project within the proposed critical habitat units, an applicant may set aside five to ten acres of conservation land at a cost of approximately \$30,000 per acre. Several commenters suggested that the number of acres set aside for conservation were too low. Based on a review of the land set aside for conservation in the context of previous consultations, and based on the acreage estimates provided by several commenters, this analysis concludes that 40 acres represents a more accurate high estimate of the number of acres of conservation land associated with a typical large project. The result of this change is reflected in Exhibit Add-4.
- **Presence of a Biological Monitor.** The DEA estimates that, for a typical project, a biological monitor will be present for five to 20 days at a cost of \$2,500 to \$10,000

⁷ Interviews with senior biologists at Tetra Tech, Inc., San Bernardino CA; SJM Biological Consultants, San Diego CA; P & D Environmental, Orange CA; Dames and Moore, Inc., Rancho Cucamonga CA; a consulting botanist, Santa Ana CA; and Natures Image, Inc., CA.

⁸ See footnote 7.

to the applicant. One commenter suggested that more than one biological monitor is often necessary for a typical 100-acre project, and that the costs of biological monitoring can reach \$55,000. Conversations with local biological consultants confirm that one to two biological monitors may be necessary for a typical project. While costs as high as \$55,000 are possible, the biological consultants indicate that the total costs for biological monitors for a typical large project can range from \$2,500 to \$20,000. This revised cost range is reflected in Exhibit Add-4.

- **Education Programs.** The DEA estimated that a typical education program could involve costs ranging from \$300 to \$1,200. One commenter suggested that this estimate was too low, and that the costs for education programs can reach \$22,000 per project. While costs as high as \$22,000 are possible, conversations with local biological consultants indicate that education programs for typical large projects generally cost between \$1,000 to \$7,000. This revised cost range is reflected in Exhibit Add-4.
- **Habitat Restoration and Enhancement.** The DEA estimates that restoring and enhancing the areas temporarily disturbed during construction can cost between \$20,000 and \$40,000. One commenter suggests that this range underestimates the costs developers face to restore kangaroo rat habitat. In fact, a 1993 study indicates that restoration costs can range from \$1,800 per acre (based on a project using volunteer labor) to \$240,000 per acre (based on a California Department of Transportation project that involved transplanting mature trees). Local biological consultants that perform restoration work for kangaroo rat habitat indicate that such restoration typically costs \$50,000 to \$75,000 per acre. The number of acres disturbed is highly dependent on the specific project; however, one commenter suggests a typical project involves two acres of re-vegetation. This addendum assumes that the total cost of habitat restoration and enhancement for a typical project ranges between \$100,000 and \$150,000. This revised cost range is reflected in Exhibit Add-4.
- **Long Term Monitoring.** The DEA estimates that monitoring a re-vegetated site for a period of three to five years could include five to 30 site visits, annual habitat assessments, the clearing of non-native vegetation, and the preparation of status reports. The DEA estimates the costs of these activities to range from \$5,000 to \$40,000. One commenter suggests that monitoring costs could be as high as \$180,000 per project. While costs this high are possible, conversations with local biological consultants indicate that the costs of long term monitoring for a typical large project fall within the range \$18,000 to \$75,000, depending on how many acres were disturbed and how many site visits are required. This revised cost range is reflected in Exhibit Add-4.
- **Project Coordination.** The DEA does not provide an estimate for the costs associated with time spent in meetings by the project manager and the biological consultants to plan and coordinate construction, conservation, and monitoring. One commenter suggested these costs should be included. Conversations with local

biological consultants indicate that some clients do not require any meetings while other may require meetings every month for a year. Project managers that do not require meetings are still likely to spend some time communicating with the consultants over the telephone or electronic mail. Thus, the total cost to the project manager for a typical project (including both the consultants and the project managers time) is likely to range from \$6,000 to \$12,000. This revised cost range is reflected below in Exhibit Add-4.

Summary of Revised *Typical* Project Modification Costs

Based on the information presented above, this addendum provides revised estimates of the costs associated with project modifications. As mentioned in the DEA, the costs of *informal* project modifications are generally estimated to be half the cost of project modifications associated with *formal* consultations. Exhibit Add-4 below reflects these revisions.

Exhibit Add-4				
REVISED ESTIMATED ECONOMIC COSTS ASSOCIATED WITH POTENTIAL <i>TYPICAL</i> PROJECT MODIFICATIONS				
Potential Project Modification (one project)	Informal		Formal/Substantive Re-initiation	
	Low	High	Low	High
Conservation Measures	\$0	\$0	\$150,000	\$1,200,000
Presence of Biological Monitors	\$2,500	\$10,000	\$2,500	\$20,000
Education Program	\$1,000	\$7,000	\$1,000	\$7,000
Habitat Restoration and Enhancement	\$50,000	\$75,000	\$100,000	\$150,000
Long Term Monitoring Program	\$9,000	\$37,500	\$18,000	\$75,000
Project Plan Alterations	\$2,000	\$20,000	\$1,000	\$10,000
Project Coordination	\$3,000	\$6,000	\$6,000	\$12,000
Total Project Modification Costs	\$67,500	\$155,500	\$278,500	\$1,474,000
Source: Interviews with Jones & Stokes Associates, Inc., Irvine CA, May 2001 and Dudek and Associates, Encinitas, CA, April 2001, and with senior biologists at Tetra Tech, Inc., San Bernardino CA; SJM Biological Consultants, San Diego CA; P & D Environmental, Orange CA; Dames and Moore, Inc., Rancho Cucamonga CA; a consulting botanist located in Santa Ana CA; and Natures Image, Inc., CA.				

Section 4.4.1 Significant Project Modifications and Delays

The DEA recognizes that the section 7 consultation process for some projects may result in project modifications or delays that are more significant than the modifications discussed in the previous section and summarized in Exhibit Add-4. The DEA estimated that the cost of these *significant* project modifications could range from \$150,000 to \$2 million, per project. This range was based on a set of case studies that provide examples of the costs that could be associated with *significant* project modifications resulting from section 7 consultations. To estimate the total costs associated with *significant* project modifications, this per-project range of costs was multiplied by the number of projects requiring *significant* project modifications, regardless of the type of project.

Several commenters questioned the assumptions underlying the cost estimates derived in these case studies, and commenters also provided additional information regarding other possible types of *significant* project modifications. Based on this information, this addendum revises the low and high end per-project cost estimates associated with “alternate sources for water supply.” The low end estimate is adjusted to reflect new information regarding the cost of obtaining water from the California State Water Project. The high end cost estimate is revised to reflect a new case study, the "Seven Oaks Dam" project. In addition, estimates of potential costs associated with residential, commercial, and industrial “projects that may not be developed” are revised to reflect information on the value of land within the proposed designation. More detailed descriptions of these revisions are provided below.

Revised “Alternate Sources for Water Supply” Case Study

The DEA assumes that a section 7 consultation for the kangaroo rat could result in a modification that affects water conservation and supply activities in the region. An example of this type of effect would be a modification in the operation and maintenance activities associated with a spreading ground or percolation basin. The proposed critical habitat designation encompasses hundreds of acres of spreading ground and percolation basins. Local water agencies use these facilities to spread recycled water, captured native water, and stormwater flows. After the water is spread, it naturally percolates through the gravel and soil to recharge the underlying aquifer. This water is then available to be pumped up as needed, treated, and served to local water customers.

When water flows into the percolation basins, it often carries large amounts of sediment. As the water percolates underground, the sediment remains in the basin. Over time, this sediment builds up and reduces the capacity of the basin to hold water, so less water can be percolated underground. Local water agencies clear out this sediment using heavy machinery as routine operation and maintenance of the basins. During this process, native vegetation may be cleared. Local water agencies believe that these operations may be subject to section 7 consultation. If the consultation process results in modification to the way the water agencies operate and maintain the basins, they fear that they will not be able to conserve as much water each year.

In order to estimate the economic costs of this type of *significant* project modification, Section 4.4.1 of the DEA provides a case study in which a water district imports water from an alternate source such as the California State Water Project. The DEA assumes that the water district would have to alter the way it operates a typical 100-acre spreading ground in order to reduce the

impacts to the kangaroo rat. As a result, the spreading ground could lose an average of 800 acre feet of water per year to evaporation or runoff. This amount represents two percent of the annual capacity of such an operation, or the amount of water used by 1,600 typical homes in a year. The cost to replace this water is based on the cost of importing water (\$225/acre foot) minus the cost of pumping and distributing conserved water (\$110/acre foot).⁹ These cost figures were presented by a local water district. Thus the total cost over ten years could reach \$920,000 (rounded up to \$1 million in the DEA).

Additional review of the information provided by the local water agency since the publication of the DEA revealed that a loss of ten percent of annual capacity of the spreading ground could result from a *significant* project modification. Thus, a typical spreading ground that annually conserves approximately 40,000 acre feet of water could lose 4,000 acre feet each year. Over ten years, the total amount of water lost would be 40,000 acre feet.

In addition, one commenter notes that the only alternate source of water is from the California State Water Project at a cost of \$379 per acre foot. The commenter assumes that this figure should be adjusted upward by \$100 per acre foot to include the expected additions to this price due to California's energy crisis and the signing of long term energy contracts. While it is beyond the scope of this analysis to project what the price of energy will be in California over the next 10 year, conversations with the Chief of the California State Water Project Analysis Office indicate that \$100 is a reasonable estimate of the effects of future energy prices on the cost of water.¹⁰ Thus, the net cost to the local agency to replace the lost water above would be the cost of importing (\$479 per acre foot) minus the cost of pumping and distributing conserved water (\$110 per acre foot), or \$369 per acre foot. Multiplying the net cost of water times the total amount of water lost over ten years (40,000 acre feet) gives a total economic impact of \$14.8 million. This estimate is a more accurate indicator of the magnitude of costs associated with alternate sources of water in the region than the \$1 million figure provided in the DEA. This figure is used as a low end *significant* project modification cost in the calculation of total economic costs later in this addendum, because it represents the costs that a typical spreading ground could face. However, as discussed in the Seven Oaks Dam case study below, the proposed critical habitat designation may affect significantly larger water conservation projects than a 100-acre spreading ground.

New Case Study: "Seven Oaks Dam"

The Seven Oaks dam is a recently completed flood control facility located in the northeast corner of proposed critical habitat Unit 1. The dam is not currently used for water conservation, however, there are plans to use it for water conservation in the future. If these plans trigger a section 7 consultation, one commenter posits that the Service is unlikely to allow any water conservation

⁹ Letter from Best, Best & Krieger, LLP to Industrial Economics, Inc., regarding "United State Fish and Wildlife Service Economic Analysis of the Proposed Designation of Critical Habitat for the San Bernardino Kangaroo Rat," on May 23, 2001.

¹⁰ Personal communications with Chief, State Water Project Analysis Office, October 2001 and February 2002.

activities at the dam. The commenter provides information suggesting that if plans to use the Seven Oaks dam for water conservation are approved, the dam could provide 15,100 acre feet of water per year. Using the cost of importing water of \$479 per acre foot described above, the cost to replace the amount of water potentially conserved by the dam would be \$7.2 million dollars per year, or \$72 million over ten years.

However, the assumptions and cost estimates used by the commenter may not be accurate for several reasons. The commenter assumes that:

1. Congress will authorize the use of the dam for water conservation;
2. Conservation will take place over the entire ten year time frame;
3. The treatment costs of stored water are zero;
4. Local water agencies will import the same amount of water that would have been stored behind the dam; and
5. A section 7 consultation will result in the loss of all the water conserved behind the dam.

Congress has not yet authorized the use of the Seven Oaks dam for water conservation. According to the ACOE, the construction of the Seven Oaks dam was authorized by Congress as a flood control facility, with no mention of water conservation. The ACOE is currently awaiting guidelines from the Service regarding the operations of the dam as a flood control facility before it will consider authorizing water conservation activities.¹¹ Thus, it is uncertain whether the dam will ever be authorized for water conservation activities.

If the ACOE does authorize the use of the dam in part as a water conservation facility, the local water agencies will have to construct a pipeline to connect the dam to other water conveyance facilities. Congressional authorization and construction activities are likely to take several years. Therefore, the commenter's second assumption that water conservation could have occurred for all of the ten years considered in the DEA time frame is likely to overstate the economic impacts to the region.

As mentioned in the previous case study above, it is important to consider the net cost of water when determining economic impacts. In other words, the economic impact of a project modification is the cost of the modification, minus the costs that would have occurred absent the modification. The commenter's third assumption is that the water conserved behind the Seven Oaks dam could be distributed to customers at no cost. However, it is likely that there would be some cost per acre foot to treat and distribute the water to local residents. Therefore, when comparing the cost of utilizing water conserved by the dam with the cost of importing State Water Project water, the

¹¹ Personal communication with Chief of Hydrology and Hydraulics Branch, Army Corps of Engineers, Los Angeles Office, on November 11, 2001.

difference between these two costs, or the *net* cost, should be used. It is likely that the net cost will be less than \$479 per acre foot.

The commenter's fourth assumption is that water agencies will import the same amount of water from the State Water Project as could be conserved behind the Seven Oaks Dam. This assumption will overstate costs of local demand, which may not be 15,100 acre feet above current production in the first few years. If the demand is high enough to import State Water Project water, water agencies may attempt to improve the efficiency of their current operations to meet some of the demand. If the higher cost of water is passed on to consumers, they would be expected to conserve water and reduce their demand. Elasticities of demand for water in areas with water scarcity range from -0.1 to -0.6 (i.e., a one percent increase in water prices reduces demand by one-tenth to six-tenths of one percent).¹² Thus, it is possible that, in a scenario in which water conserved behind the Seven Oaks dam is not available, local water agencies might need to import less than 15,100 acre feet of water per year, reducing the commenter's cost estimate of \$72 million.

Finally, the commenter's assumption that all of the water conserved behind the Seven Oaks dam will be lost to the region may not accurately predict the outcome of a section 7 consultation on water conservation activities. The dam is already equipped to extract stored water. However, a gravity-fed pipeline is needed to connect this equipment to other existing water conveyance facilities.¹³ A large pipeline construction project in this area is likely to trigger a section 7 consultation with the Service. In order to reduce the impacts to the kangaroo rat and other listed species, potential modifications required as a result of a section 7 consultation might include (1) certain restrictions and delays in the pipeline construction process, (2) an alternate location for the pipeline to avoid as much critical habitat as possible, or (3) the use of trucks on existing roads to bring the water to a distribution point. The consultation may also require that a certain quantity of water be maintained behind the dam at certain times of the year to allow the ACOE to release water in a manner that mimics the hydrologic flows required to maintain suitable kangaroo rat habitat downstream. Thus, the local agencies may not be able to conserve as much water as they currently project. However, it is unlikely that the amount of water available to the local conservation agencies will become zero as a result of the section 7 consultation.

In order to judge the types of costs that could occur at the Seven Oaks Dam due to the listing of the kangaroo rat and the designation of critical habitat, this analysis makes the assumption that the ACOE will seek authorization from Congress to use the dam as a flood control facility, and that

¹² Billings, R. Bruce and Donald E. Agthe, "Price Elasticities for Water: A Case for Increasing Block Rates," *Land Economics*, 56(1): 73-84, 1980; Foster, Jr., Henry S. and Bruce R. Beattie, "Urban Residential Demand for Water in the United States," *Land Economics*, 55(1): 43-58, 1979; Jones, C. Vaughan and John R. Morris, "Instrumental Price Estimates and Residential Water Demand," *Water Resources Research*, 20(2): 197-202, 1984; and Young, Robert, "Price Elasticity of Demand for Municipal Water: A Case Study of Tucson, Arizona," *Water Resources Research*, 9(4): 1068-1072, 1973.

¹³ Letter from Best, Best & Krieger, LLP regarding "San Bernardino Valley Municipal Water District/ Seven Oaks Dam," November 9, 2001.

Congress will authorize this use. This might not happen for reasons entirely independent of the kangaroo rat or its critical habitat, in which case all of the cost estimates that follow would be zero. However, in order to use the Seven Oaks Dam as a case study for the types of costs associated with a *significant* project modification, this assumption is necessary.

Because the ACOE is not currently considering using the Seven Oaks Dam as a water conservation facility, this analysis assumes that it will take at least one year for the ACOE to consider and study the water conservation option and to receive authorization from Congress. Another year will be required to construct the pipeline from the dam. This construction will likely generate a section 7 consultation that may result in certain restrictions, delays, and costs to offset impacts to listed species and/or critical habitat. The economic costs of these restrictions and regulations are likely to fall within the range of the *typical* project modification costs presented in Exhibit Add-4.

In addition to these *typical* costs, the construction process may be delayed for one year due to the section 7 consultation process. Local agencies may have to import water during this period in order to meet demand. Using the commenter's estimates of 15,100 acre feet of water for one year, and \$479 per acre foot of water from the State Water Project, the cost of this delay could be as much as \$7.2 million. This is a conservative (i.e., more likely to overstate costs than understate them) cost estimate because it does not include a net cost of water or account for the elasticity of demand for water.

In addition, required section 7 consultations may reduce the amount of water that the local agencies can utilize for conservation. As mentioned above, local agencies currently predict that they will be able to utilize 15,100 acre feet of conserved water behind the dam each year. Assuming that local agencies are only able to conserve half of what they are currently predicting (as a result of operating procedures designed to reduce harm to the kangaroo rat and developed during the section 7 consultation process), they would have to import 7,550 acre feet of water annually. Assuming that 100 percent of the water no longer available for consumption would be purchased at a cost of \$479 per acre foot, the annual cost to local agencies would be \$3.6 million. The local agencies are not likely to face these costs for the next three years due to ACOE studies, pipeline construction, and section 7 delays (explained above). Thus the cost of importing water for the ten year time frame of this analysis would be approximately \$25.3 million. Therefore, in addition to the cost of typical project modifications associated with water projects, a *significant* project modification may result in additional costs of \$32.5 million over ten years, including \$7.2 million in delay costs. Again, this is assumed to be a conservative estimate (i.e., more likely to overstate than understate the true costs), because it assumes local water agencies need to import all of the water that could potentially be conserved behind the dam, and that they will not find other ways to meet demand.

The future state of water management at the Seven Oaks dam is difficult to predict. As stated above, the ACOE could decide not to permit water conservation activities at the dam for reasons entirely independent of the kangaroo rat. Similarly, Congress may decide not to authorize the use of the dam as a water conservation facility. In either case, the economic costs attributable to the kangaroo rat could be zero. However, the Seven Oaks Dam case study indicates that costs as high as \$32.5 million are possible in this region. Thus, this figure is used as a high-end cost estimate for a *significant* project modification in the calculation of total costs later in this addendum.

Revised “Alternate Project Sites” Case Study

The DEA provided a case study of a *significant* project modification that involved altering the location of a commercial, residential or industrial project. This case study was based on information provided by a local water agency, and was used to generate an estimate of the likely total economic impact of critical habitat on residential and commercial development. Based on a review of the per-acre costs of vacant land inside and outside of the proposed critical habitat designation, the DEA estimated that moving a 50-acre project from low value land to high value land could cost the developer as much as \$2 million.

One commenter notes that extending the concept of alternate project sites to large residential projects is not valid in this region. The commenter supports this assertion by stating that "the development community has acquired every acre of buildable land in the inland area and plans to use them." Due to the lack of vacant developable land outside of the critical habitat units, the commenter suggests that it is not reasonable to assume that project managers can move large residential projects to alternate sites within the region.

Under most circumstances, plans for development projects can be modified to avoid adverse modification determinations, typically based on Service recommendations (e.g., avoid sensitive areas and/or limit construction to previously disturbed areas). However, as recognized in the DEA, it is possible that the costs of these or other modifications could make some projects uneconomical. In such cases several economic impacts could occur:

1. The value of the land in question could fall, reflecting the fact that it can no longer be developed into its highest and best market use.
2. With fewer acres available for development, the price of land in communities with critical habitat could rise. An increase in land costs will increase the price of new housing (and ultimately, all housing). Given higher costs, fewer units will be demanded. In the near term, the most obvious effect would be the construction of fewer homes and commercial developments.
3. If fewer residential and commercial developments are constructed, secondary economic effects might be felt in the impacted communities (i.e., multiplier effects).

These categories of impact are discussed below.

New Case Study: “Projects That May Not Be Developed”

Several commenters suggested that the designation of critical habitat may result in project managers abandoning certain projects in the region. While it is unlikely that a consultation would result in a project not being developed, this possibility exists if a project manager’s plans are sufficiently constrained so as to render a particular project financially unattractive. One commenter offers an estimate of the economic impact if plans for a large number of residential housing projects within the proposed critical habitat designation are not completed. Assuming 1,200 acres of land are removed from residential development and an average development density of four homes per acre, the commenter suggests that the area would "end up with" 4,800 fewer homes. Using a median home price of \$208,963, the commenter calculates the resultant “economic impact” to be \$1.003 billion, the retail value of homes not constructed.

This commenter’s analysis reflects an all-or-nothing, static view of the economic impacts likely to arise from designation, assuming the absence of adequate substitutes and an assumption that the area will be built-out within ten years. To presuppose this fixed course for the market, culminating in billion dollar losses, ignores a series of compensating adjustments that are likely to occur over time.

As described in the DEA, the California Urban and Biodiversity Analysis (CURBA) model predicts that almost 15,000 acres of land located within the boundaries of the proposed critical habitat designation are projected to be developed as residential housing or commercial facilities in the next ten years. Assuming an average development size of 50 to 100 acres, this translates to approximately 150 development projects within the extant boundaries of the designation. The DEA assumes that *all* of these projects will be impacted by critical habitat, and the extent of these impacts will range from simple technical assistance calls to formal consultations requiring project modifications. However, the DEA predicts that only one to two of these projects may be impacted by *significant* project modifications that could cause a project to become financially unattractive.¹⁴ This addendum adds an upper bound impact estimate that assumes that 21 development projects are canceled. This effectively assumes that all development projects that require formal consultation will have significant project modifications, resulting in the developer canceling the project. This is a conservative upper bound (i.e., more likely to overstate than understate losses), recognizing that the Service must ensure that any reasonable and prudent alternatives it suggests during a formal section 7 consultation process are economically and technically feasible and can be implemented in a manner consistent with the intended purpose of the proposed project.¹⁵

¹⁴The DEA assumes that there will be 122 to 167 residential, commercial or industrial projects within the extant boundaries of the designation, with an average size of 100 acres (50 for industrial developments). It further assumes that all of these will require technical assistance, and one-half will generate a Federal nexus. Of these projects, one-quarter assumed to require formal consultation (based on past consultation history on the kangaroo rat).

¹⁵ U.S. Fish and Wildlife Service, *Final ESA Section 7 Consultation Handbook*, March 1998.

This addendum considers two scenarios: a lower bound estimate of development impacts reflecting the cancellation of 1.5 development projects, and an upper bound estimate that reflects the cancellation of 21 projects. Note that the analysis presented below reflects the impact of not developing 130 to 1,800 acres of land, and thus the results are not sensitive to the assumed project size.

Significant Project Modification Costs Associated with "Projects That May Not Be Developed"

As noted above, designation of critical habitat may place constraints on the amount and possibly the type of residential, commercial, and industrial development that can occur on specific parcels that lie in the path of development. In constraining the development potential of these parcels, the financial return a developer can realize from a project is diminished. Developers, in turn, will pay less for this land, resulting in an economic impact to the landowner. In extreme cases, the constraints imposed by critical habitat may result in the land not being developed. Such impacts are also one measure of the social welfare effects of the designation.

This addendum assumes that a total of 1.5 to 21 projects of 50 to 100 acres each will be canceled. It further assumes that the value of this land falls to zero (i.e., it has no market value). In order to monetize the impact that would result under these scenarios, this DEA relies on estimates of the value of developable land with no encumbrances for each of the potentially affected communities, as shown in Exhibit Add-5.

Exhibit Add-5	
DEVELOPABLE LAND VALUES WITHIN THE PROPOSED CRITICAL HABITAT DESIGNATION	
Location	Value
San Bernardino County	\$55,383
Colton	\$63,404
Fontana	\$76,878
Highland	\$95,201
Rancho Cucamonga	\$82,393
Rialto	\$66,384
San Bernardino City	\$73,683
Yucaipa	\$114,425
Riverside County	\$69,460
San Jacinto	\$41,922
Average Value (Weighted by Developable Acres in Critical Habitat by community)	\$72,890
For communities not listed, the average considers the county-level land value.	
Source: Economic and Planning Systems. "Land Value Analysis for SBKR EA," Sacramento, California, March 2002.	

Given the weighted-average land value presented in Exhibit Add-5, this addendum estimates that the total impact of the designation on development projects, as measured by the reduced value of land, will be \$9.5 to \$131 million over 10 years (i.e., \$1 to 13 million per year). Nearly three-quarters of these economic effects would be expected to be incurred in Unit 2 (47 percent) and Unit 4 (26 percent).¹⁶

It is important to note that this analysis assumes that the value of impacted land falls to zero. This extreme scenario is unlikely. It is more likely that the land would be developed at a reduced density or in uses with a lower economic value to the owner. As a result, this analysis provides an upper bound estimate of the potential impact by considering the full value of the land.

¹⁶ This assumes that each acre of developable land within critical habitat has an equal probability of being impacted by a significant project modification. Thus, units with greater areas of developable land are expected to experience greater impacts.

Revised *Significant* Project Modification Unit Costs

In section 4 of the DEA, per project costs were calculated for three different case studies, "Significant Project Delay," "Alternate Sources for Water Supply," and "Alternate Project Sites." The range of costs identified across these three case studies was \$150,000 to \$2 million per project. To calculate total costs associated with *significant* project modifications, the total universe of projects that were assumed to require *significant* project modifications was multiplied by this range, regardless of the type of project.

The approach used in this addendum has been refined so that per project costs of *significant* project modifications are reflective of the type of project being modified. Development projects estimated to require significant modification may experience costs of approximately \$72,890 per acre, derived in the case study "projects that may not be developed." Alternatively, the costs of other types of projects (e.g. water supply and conservation activities, flood control activities, and road maintenance and construction) are expected to fall within the range \$14.8 million to \$32.5 million, the costs estimated in the case studies "alternative sources of water supply" and "Seven Oaks Dam."

Regional Economic Effects of Critical Habitat

As noted above, given a reduction in the total number of acres available for development, it is possible that fewer overall housing units will be constructed in the communities affected by critical habitat in the long run. From a regional economic perspective, construction-related firms and secondary industries that support these firms may realize reduced revenues and employment relative to a no-designation scenario, should less development ultimately occur. The probability and magnitude of such economic impacts depends on the spatial distribution of habitat in relation to feasibly developable lands and existing land use regulations, as well as land and housing market conditions over time.

Given uncertainties in (1) the types of project modifications likely to be required of residential and commercial development within critical habitat; and (2) the effects of these modifications on the overall housing market in the affected communities, this addendum does not attempt to estimate the regional economic effect of the designation, beyond the estimate of reduced land values presented above. It is important to note, however, that the upper bound scenario presented above assumes 1,800 acres of land, over 10 years, will not be developed. This represents less than two percent of the total acreage of land forecast to be developed in the next ten years in all of the towns and cities potentially affected by the proposed designation.

Similarly, this addendum considers the potential economic impact of significant project modifications to regional water projects. While delays and modifications to these projects could result in changes in the regional economy (i.e., higher water costs leading to higher water prices, and thus reduced activity in some sectors), this addendum does not attempt to measure these effects given (1) the very small *relative* effect on water supply in the region that would occur even under the worst-case scenario (i.e., relative to the overall consumption of water in the region); and (2) the uncertainty in which sectors would be most affected by a change in the cost of water.

Section 4.7 California Environmental Quality Act (CEQA)

Section 4.7 of the DEA assumes that certain project managers may be required to prepare an Environmental Impact Report (EIR) due to the designation of critical habitat (see sections 2.3.4 and 4.7 of the DEA for a detailed discussion of CEQA). The DEA that estimates the additional cost of preparing this report will range between \$2.2 and \$11.2 million over ten years. This is based on the number of projects that are likely to occur within the proposed critical habitat designation and the average cost of preparing an EIR. As mentioned above, several commenters provided information regarding projects that are likely to occur in the proposed designation that were not considered in the DEA. Thus total rounded range of costs associated with CEQA is likely to increase slightly to between \$2.2 and \$11.3 million over ten years.

Section 4.8 Potential Impacts on Small Businesses

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).¹⁷ 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.¹⁸ 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. Accordingly, the following represents a screening level analysis of the potential effects of critical habitat designation on small entities to assist the Secretary in making this certification.

This analysis determines whether this critical habitat designation potentially affects a "substantial number" of small entities in counties supporting critical habitat areas. It also quantifies the probable number of small businesses that will experience a "significant effect." While SBREFA does not explicitly define either "substantial number" or "significant effect," the Small Business Administration (SBA) and other Federal agencies have interpreted these terms to represent an impact on 20 percent or more of the small entities in any industry and an effect equal to three percent or more of a business' annual sales.¹⁹

Estimated Number of Small Businesses Affected: The "Substantial Number" Test

¹⁷ Regulatory Flexibility Act, 5 U.S.C. 601 et. seq.

¹⁸ Thus, for a regulatory flexibility analysis to be required, impacts must exceed a threshold for "significant impact" **and** a threshold for a "substantial number of small entities." See 5 U.S.C. 605 (b).

¹⁹ See U.S. Small Business Administration, The Regulatory Flexibility Act: An Implementation Guide for Federal Agencies, 1998. Accessed at: www.sba.gov/advo/laws/rfaguide.pdf on December 3, 2001.

Based on the past consultation history for the kangaroo rat, this analysis anticipates that the designation of critical habitat could affect small businesses associated with six activities including residential, commercial, and industrial development; mining for sand and gravel, airport activities, and water conservation and supply activities. This analysis uses a range of Standard Industrial Classification (SIC) codes representing all retail and manufacturing trade to represent commercial and industrial development, respectively; single SIC codes represent all other activities. Because it is not possible to predict the specific type of commercial or industrial businesses that critical habitat is likely to affect, this analysis encompasses the entire realm of anticipated possibilities in order to capture the likelihood that any one type of business will experience effects. The SBA definitions for small businesses addressed in this analysis are provided below.

- Residential Development (SIC 6552) - annual sales less than \$6.0 million
- Commercial/Retail (SIC 5211-5999) - annual sales less than \$6.0 million²⁰
- Industrial/Manufacturing (SIC 2011-3999) - less than 500 employees²¹
- Sand and Gravel Mining (SIC 1442) - less than 500 employees
- Airports (SIC 4581) - annual sales less than \$6.0 million
- Water Conservation and Supply (SIC 4941) - annual sales less than \$6.0 million

To be conservative, (i.e., more likely to overstate impacts than understate them), this analysis assumes that a unique company will undertake each of the projected consultations in a given year, and so the number of businesses affected is equal to the total annual number of consultations (both formal and informal).²² This analysis also limits the universe of potentially affected entities to include only those within the counties in which critical habitat units lie; this interpretation produces far more conservative results than including all entities nationwide.

²⁰ Standards for SIC codes 5211-5999 vary between \$6.0 million and \$23 million. This analysis conservatively adopts the standard of less than \$6.0 million in annual sales, which is likely to overstate the likelihood that effects will be significant.

²¹ Standards for SIC codes 2011-3999 vary between 500 and 1,500 employees. This analysis conservatively adopts the standard of fewer than 500 employees, which is likely to overstate the likelihood that effects will be significant.

²² While it is possible that the same business could consult with the Service more than once, it is unlikely to do so during the one-year time frame addressed in this analysis. However, should such multiple consultations occur, they would concentrate effects of the designation on fewer entities. In such a case, the approach outlined here likely would overstate the number of affected businesses.

First, the *number* of small businesses affected is estimated. As shown in Exhibit Add-6, the following calculations yield this estimate:²³

- Estimate the number of businesses within the study area affected by section 7 implementation annually (assumed to be equal to the number of annual consultations);
- Calculate the *percent* of businesses in the affected industry that are likely to be small;
- Calculate the *number* of affected small businesses in the affected industry;
- Calculate the *percent* of small businesses likely to be affected by critical habitat.

²³ Note that because these values represent the probability that small businesses will be affected during a one-year time period, calculations may result in fractions of businesses. This is an acceptable result, as these values represent the probability that small businesses will be affected.

Exhibit Add-6

ESTIMATED ANNUAL NUMBER OF SMALL BUSINESSES AFFECTED BY CRITICAL HABITAT DESIGNATION: THE "SUBSTANTIAL" TEST

Industry Name		Residential Development SIC 6552	Commercial/ Retail Development SIC 5211-5999	Industrial/ Manufacturing Development SIC 2011-3999	Sand and Gravel Mining SIC 1442	Airports SIC 4581	Water Conservation and Supply SIC 4941
Annual number of affected businesses in industry (Equal to number of annual consultations)	By formal consultation	1.2	0.28	0.60	0.25	0.20	2.9
	By informal consultation	3.7	0.83	1.8	0.74	0.60	8.7
Total number of <i>all</i> businesses in industry within study area		350	26,588	7,175	54	123	148
Number of <i>small</i> businesses in industry within study area		305	21,602	7,156	54	91	96
Percent of businesses that are small (Number of small businesses)/(Total Number of businesses)		87%	81%	100%	100%	74%	65%
Annual number of small businesses affected (Number affected businesses)*(Percent of small businesses)		4.2	0.9	2.4	1.0	0.6	7.5
Annual percentage of small businesses affected (Number of small businesses affected)/(Total number of small businesses); >20 percent is substantial		1.4%	0.004%	0.03%	1.8%	0.7%	7.8%

This calculation reflects conservative assumptions and nonetheless yields an estimate that is still far less than the 20 percent threshold that would be considered “substantial” for each industry. As a result, this analysis concludes that a significant economic impact on a substantial number of small entities will not result from the designation of critical habitat for the kangaroo rat. Nevertheless, an estimate of the number of small businesses that will experience effects at a significant level is provided below.

Estimated Effects on Small Businesses: The “Significant Effect” Test

Costs of critical habitat designation to small businesses consist primarily of the cost of participating in section 7 consultations and the cost of project modifications. To calculate the likelihood that a small business will experience a significant effect from critical habitat designation for the kangaroo rat, the following calculations were made:

- Calculate the per-business cost. This consists of the unit cost to a third party of participating in a section 7 consultation (formal or informal) and the unit cost of associated project modifications. *To be conservative, this analysis uses the high-end estimate for each cost.*
- Determine the amount of annual sales that a company would need to have for this per-business cost to constitute a “significant effect.” This is calculated by dividing the per-business cost by the three percent “significance” threshold value.
- Estimate the likelihood that small businesses in the study area will have annual sales equal to or less than the threshold amount calculated above. This is estimated using national statistics on the distribution of sales within industries in comparison with the SBA definition for small businesses.²⁴
- Based on the probability that a single business may experience significant effects, calculate the expected value of the number of businesses likely to experience a significant effect. This is calculated by multiplying the number of small businesses bearing a cost by the probability that they will experience that cost as significant.
- Calculate the percent of businesses in the study area within the affected industry that are likely to be affected significantly. This is done by dividing the number of small businesses experiencing significant effects by the total number of small businesses in the study area.

Calculations for costs associated with designating critical habitat for the kangaroo rat are provided in Exhibit Add-7 below.

²⁴ This probability is calculated based on national industry statistics obtained from the Robert Morris Associated *Annual Statement of Studies: 2001-2002* and from comparison with the SBA definitions of small businesses, available at <http://www.sba.gov/regulations/siccodes/siccodes.html>.

Because the costs associated with designating critical habitat for the kangaroo rat are likely to be significant for between zero and eight small businesses per year per industry (which is equal to between zero and eight percent of businesses in the affected industries) in the affected counties, this analysis concludes that a significant economic impact on a substantial number of small entities will not result from the designation of critical habitat for the kangaroo rat. This would be true even if all of the effects of section 7 consultation on these activities were attributed solely to the critical habitat designation.

Exhibit Add-7

ESTIMATED ANNUAL EFFECTS ON SMALL BUSINESSES: THE “SIGNIFICANT EFFECT” TEST

Industry	Residential Development SIC 6552	Commercial/ Retail Development SIC 5211-5999	Industrial/ Manufacturing Development SIC 2011-3999	Sand and Gravel Mining SIC 1442	Airports SIC 4581	Water Conservation and Supply SIC 4941
<i>Formal Consultations with Significant Project Modifications</i>						
Annual Number of Small Businesses Affected	1.1	0.23	0.60	0.03	0.01	0.19
Per-Business Cost	\$7,313,880	\$7,313,880	\$3,669,395	\$32,572,960	\$32,572,960	\$32,572,960
Level of Annual Sales Below which Effects Would Be Significant (Per-Business Cost / 3%)	\$243,796,008	\$243,796,008	\$122,313,171	\$1,085,765,333	\$1,085,765,333	\$1,085,765,333
Probability that Per-Business Cost is Greater than 3% of Sales for Small Business ²⁵	100%	100%	100%	100%	100%	100%
Probable Annual Number of Small Businesses Experiencing Significant Effects (Number Small Businesses)* (Probability of Significant Effect)	1.1	0.23	0.60	0.03	0.01	0.19

²⁵ Because the level of annual sales below which effects would be significant exceeds the level of sales that defines a small business for each of the affected industries, these costs will be significant for all small businesses that bear them. Note that the definitions of a small business in the commercial/retail sector vary, and so the threshold used for this analysis (up to \$6.0 million in annual sales) represents the low end of the spectrum and is likely to overstate the significance of the effects. In addition, small businesses in the industrial/manufacturing sector and in sand and gravel mining are defined by the number of employees rather than by sales. Because of the magnitude of the per-business cost presented in this analysis, it conservatively assumes that all businesses in these sectors will experience these costs as significant.

Exhibit Add-7

ESTIMATED ANNUAL EFFECTS ON SMALL BUSINESSES: THE “SIGNIFICANT EFFECT” TEST

Industry	Residential Development SIC 6552	Commercial/ Retail Development SIC 5211-5999	Industrial/ Manufacturing Development SIC 2011-3999	Sand and Gravel Mining SIC 1442	Airports SIC 4581	Water Conservation and Supply SIC 4941
<i>Formal Consultations with Typical Project Modifications</i>						
Annual Number of Small Businesses Affected	--	--	--	0.23	0.13	1.7
Per-Business Cost				\$1,498,910	\$1,498,910	\$1,498,910
Level of Annual Sales Below which Effects Would Be Significant (Per-Business Cost / 3%)				\$49,963,667	\$49,963,667	\$49,963,667
Probability that Per-Business Cost is Greater than 3% of Sales for Small Business ²⁶				100%	100%	100%
Probable Annual Number of Small Businesses Experiencing Significant Effects (Number Small Businesses)* (Probability of Significant Effect)	--	--	--	0.23	0.13	1.7

²⁶ Because the level of annual sales below which effects would be significant exceeds the level of sales that defines a small business for each of the affected industries, these costs will be significant for all small businesses that bear them. Note that small businesses in the gravel mining industry are defined by the number of employees rather than by sales. Because of the magnitude of the per-business cost presented in this analysis, it conservatively assumes that all businesses in these sectors will experience these costs as significant.

Exhibit Add-7

ESTIMATED ANNUAL EFFECTS ON SMALL BUSINESSES: THE “SIGNIFICANT EFFECT” TEST

Industry	Residential Development SIC 6552	Commercial/ Retail Development SIC 5211-5999	Industrial/ Manufacturing Development SIC 2011-3999	Sand and Gravel Mining SIC 1442	Airports SIC 4581	Water Conservation and Supply SIC 4941
<i>Informal Consultations with Project Modifications</i>						
Annual Number of Small Businesses Affected	3.2	0.67	1.8	0.74	0.44	5.6
Per-Business Cost	\$177,610	\$177,610	\$177,610	\$177,610	\$177,610	\$177,610
Level of Annual Sales Below which Effects Would Be Significant (Per-Business Cost / 3%)	\$5,920,333	\$5,920,333	\$5,920,333	\$5,920,333	\$5,920,333	\$5,920,333
Probability that Per-Business Cost is Greater than 3% of Sales for Small Business ²⁷	99.8%	99.5%	100%	100%	99.2%	99.8%
Probable Annual Number of Small Businesses Experiencing Significant Effects (Number Small Businesses)* (Probability of Significant Effect)	3.2	0.67	1.8	0.74	0.44	5.6
Total Annual Number of Small Businesses Bearing Significant Costs in Industry	4.2	0.9	2.4	1.0	0.6	7.5
Total Annual Percentage of Small Businesses Bearing Significant Costs in Industry	1.4%	0.004%	0.03%	1.8%	0.6%	7.8%

²⁷ This probability is calculated based on national industry statistics obtained from the *RMA Annual Statement Studies: 2001-2002*, which provides data on the distribution of annual sales in an industry within the following ranges: \$0-1 million, \$1-3 million, \$3-5 million, \$5-10, \$10-25 million, and \$25+ million. This analysis uses the ranges that fall within the SBA definition of small businesses (i.e., for industries in which small businesses have sales of less than \$5.0 million, it uses \$0-1 million, \$1-3 million, and \$3-5 million) to estimate a distribution of sales for small businesses. It then calculates the probability that small businesses have sales below the threshold value using the following components: (1) all small businesses (expressed as a percentage of all small businesses) in ranges whose upper limits fall below the threshold value experience the costs as significant; (2) for the range in which the threshold value falls, the percentage of companies in the bin that fall below the threshold value is calculated as $[(\text{threshold value} - \text{range minimum}) / (\text{bin maximum} - \text{range minimum})] \times \text{percent of small businesses captured in range}$. This percentage is added to the percentage of small businesses captured in each of the lower ranges to reach the total probability that small businesses have sales below the threshold value. Note that in instances in which the threshold value exceeds the definition of small businesses (i.e., the threshold value is \$10 million and the definition of small businesses is sales less than \$5.0 million), all small businesses experience the effects as significant.

Section 4.5 Total Costs Associated with Section 7

The DEA calculates the total economic impacts of section 7 of the Act on specific land uses or activities within those areas proposed as critical habitat for the kangaroo rat. This calculation was based on the number of future projects that are likely to be impacted, and the cost of the impact(s) per project. Public comments and additional research indicate that there may be more projects impacted by the designation and that costs associated with section 7 consultations and project modifications are likely to fall within a higher range than the ranges estimated in the DEA. Exhibit Add-8 presents the revised total economic costs.

Exhibit Add-8

**REVISED ESTIMATED
SECTION 7 IMPACTS ASSOCIATED WITH LISTING AND
DESIGNATION OF CRITICAL HABITAT FOR THE KANGAROO RAT*
(ten year total)**

Category of Requirement Generating Costs	Cost Scenario	Costs to the Service Over 10 Year Period	Costs to Action Agencies Over 10 Year Period	Costs to Applicants Over 10 Year Period	Total Costs Over 10 Year Period
Technical Assistance Telephone Call	Low	\$13,000	\$0	\$7,000	\$20,000
	High	\$21,000	\$0	\$89,000	\$110,000
Presence/absence Survey	Low	\$0	\$0	\$860,000	\$860,000
	High	\$0	\$112,000	\$4,202,000	\$4,314,000
Informal Consultations and Non-substantive Re- initiations	Low	\$133,000	\$173,000	\$425,000	\$731,000
	High	\$668,000	\$883,000	\$1,486,000	\$3,037,000
Formal Consultation and Substantive Re-initiations	Low	\$137,000	\$181,000	\$305,000	\$623,000
	High	\$431,000	\$438,000	\$696,000	\$1,565,000
<i>Typical</i> Project Modifications Associated With Informal consultations	Low	\$0	\$0	\$8,706,000	\$8,706,000
	High	\$0	\$0	\$32,671,000	\$32,671,000
<i>Typical</i> Project Modifications Associated With Formal Consultation and Substantive Re-initiations	Low	\$0	\$0	\$12,322,000	\$12,322,000
	High	\$0	\$0	\$105,810,000	\$105,810,000
<i>Significant</i> Project Modifications Associated With Formal Consultation and Substantive Re- initiations	Low	\$0	\$0	\$52,296,000	\$52,296,000
	High	\$0	\$0	\$296,248,000	\$296,248,000
Total Costs*	Low	\$283,000	\$354,000	\$74,921,000	\$75,558,000
	High	\$1,120,000	\$1,433,000	\$441,202,000	\$443,755,000

* These costs do not include requirements that may be triggered within CEQA.

Source: Based on GIS analyses, information on local zoning and planning requirements, and information provided by land owners and managers potentially affected by the proposed critical habitat designation, as contained in public comments to the DEA.

Exhibit Add-8 shows the economic costs associated with high and low cost scenarios to the Service, action agencies, and applicants over a ten year period. The costs are broken down into each component of the section 7 consultation process. Exhibit Add-8 indicates that the total economic costs associated with section 7 within the proposed critical habitat boundaries including listing effects is between \$75 and \$444 million over ten years. Factoring in the revised CEQA costs mentioned above, the total cost is \$76 to \$456 million over a ten year period.

Section 4.6 Economic Impacts Incremental to the Designation of Critical Habitat

The economic impacts of the critical habitat designation independent of the listing effects in the DEA is calculated as a percentage of the total listing and critical habitat costs. This percentage is based on the areas of the proposed critical habitat that were not previously considered under the listing by action agencies (i.e., the designation will provide new information to these agencies), and the concept that the critical habitat adds an additional component to the environmental review process. In other words, the proposed designation may increase the public's knowledge of habitat needs of the species, and thus may result in some incremental requirements and costs as additional consultations are generated. The specific calculation of the percentages is explained in the DEA. To account for the revised total cost estimates above, the revised critical habitat costs independent of the listing effects are presented below in Exhibit Add-9.

Exhibit Add-9 provides the estimates of economic costs to the Service, action agency, and the applicant for both the low and high costs scenarios. The economic costs are broken down by critical habitat unit. Exhibit Add-9 indicates that the total economic cost for section 7 within the proposed critical habitat boundaries independent of listing effects is between \$13 and \$120 million over ten years. Factoring in the revised CEQA costs mentioned above, the total cost is \$15 to \$131 million over a ten year period.

Exhibit Add-9

**REVISED ESTIMATED
ECONOMIC COSTS ATTRIBUTABLE TO CRITICAL HABITAT*
(ten year total)**

Critical Habitat Unit	Cost Scenario	Costs to the Service over 10 Year Period	Costs to the Action Agency Over 10 Year Period	Costs to the Applicant Over 10 Year Period	Total Costs Over 10 Year Period
Unit 1	Low	\$10,000	\$13,000	\$2,852,000	\$2,875,000
	High	\$66,000	\$83,000	\$22,525,000	\$22,674,000
Unit 2	Low	\$20,000	\$25,000	\$5,246,000	\$5,291,000
	High	\$115,000	\$146,000	\$45,563,000	\$45,824,000
Unit 3	Low	\$4,000	\$5,000	\$1,153,000	\$1,162,000
	High	\$31,000	\$40,000	\$11,757,000	\$11,828,000
Unit 4	Low	\$5,000	\$6,000	\$1,185,000	\$1,196,000
	High	\$41,000	\$52,000	\$16,451,000	\$16,544,000
Unit 5	Low	\$0	\$0	\$69,000	\$69,000
	High	\$2,000	\$3,000	\$835,000	\$840,000
Unit 6	Low	\$11,000	\$14,000	\$2,864,000	\$2,889,000
	High	\$52,000	\$66,000	\$21,532,000	\$21,650,000
Total*	Low	\$50,000	\$63,000	\$13,369,000	\$13,482,000
	High	\$307,000	\$390,000	\$118,663,000	\$119,360,000

* These costs do not include the secondary costs associated with CEQA.

Note: Costs associated with substantive and non-substantive re-initiations were assumed to occur in Units 1 and 2, because none of the past section 7 consultations were conducted in reference to projects within these other four units.

Source: Based on GIS analyses, information on local zoning and planning requirements as well as information provided by land owners and managers potentially affected by the proposed critical habitat designation as contained in public comments to the DEA.