DRAFT ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE PENINSULAR BIGHORN SHEEP

October 2000

Prepared for:

Division of Economics
U.S. Fish and Wildlife Service
4401 N. Fairfax Drive
Arlington, VA 22203

Prepared by:

Robert E. Unsworth, Sarah J. Malloy, and Kirk R. Klausmeyer Industrial Economics, Incorporated 2067 Massachusetts Avenue Cambridge, Massachusetts 02140

Send comments on the economic analysis to:

Field Supervisor Carlsbad Field Office U.S. Fish and Wildlife Service 2730 Loker Avenue West Carlsbad, California 92008

TABLE OF CONTENTS

PREI	FACE			-1
EXE	CUTIVI	E SUM	MARY ES-	-1
SECT	ΓΙΟN 1			
1.	INTR	ODUC	TION	. 1
	1.1	Consu	ltation under section 7 of the Endangered Species Act	2.
	1.2		se and Approach of Economic Assessment	
	1.3	_	ure of Report	
SECT	ΓΙΟΝ 2			
2.		IES DI	ESCRIPTION AND	
	RELE	VANT	BASELINE INFORMATION	6
	2.1	Descri	ption of Species	6
	2.2		sed Critical Habitat Units	
	2.3	Releva	ant Baseline Information	11
		2.3.1	Baseline Statutory and Regulatory Requirements	11
		2.3.2	Socioeconomic Profile of the Critical Habitat Areas	15
SECT	ΓΙΟN 3			
3.	ANAI	LYTIC	FRAMEWORK AND RESULTS	20
	3.1	Frame	work for Analysis	20
		3.1.1	Categories of Economic Impacts	20
		3.1.2	Methodological Approach	23
		3.1.3	Information Sources	24
	3.2	Potent	ial Federal Nexuses Within Critical Habitat	24
	3.3	Potent	ial Costs and Benefits Due to Critical Habitat	26
		3.3.1	Economic Costs	27
		3.3.2	Federal Landowners and Managers	34
		3.3.3	Trust Lands	
		3.3.4	State and Local Lands	
		3.3.5	Private Lands	
		3.3.6	Total Economic Cost	
		3.3.7	Benefits	
		338	Summary of Economic Impacts	52

TABLE OF CONTENTS (continued)

3.4	Additional Impacts Due to Proposed Critical Habitat				
	3.4.1	Potential Impacts to Small Businesses	. 55		
	3.4.2	Potential Impacts to Native American Tribes	. 56		
	3.4.3	Potential Impacts Associated with Project Delays and			
		Property Values	. 57		
REFERENC	ES		. 60		

PREFACE

- 1. This report was prepared for the U.S. Fish and Wildlife Service (the Service) by Industrial Economics, Incorporated (IEc) to assess the economic impacts that may result from designation of critical habitat for the Peninsular bighorn sheep. Under section 4 (b)(1) of the 1973 Endangered Species Act (the Act), the decision to list a species as endangered or threatened is made solely on the basis of the best scientific and commercial data and analysis. By contrast, section 4 (b)(2) of the Act states that the decision to designate critical habitat must consider 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 Service personnel to ensure that potential Federal actions 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 use/Federal-agency actions provided IEc with a basis for evaluating the incremental economic impacts due to critical habitat designation for the bighorn sheep.
- 3. Section 7 of the Act 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 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. To better understand the concerns of stakeholders, IEc solicited the opinions of Federal, Tribal, State and local government agencies regarding the uses of land within the proposed critical habitat, historical consultations with the Service, and potential future consultations. Public comments and testimony submitted in response to *Proposed Determination of Critical Habitat for the Peninsular Bighorn Sheep* (65 FR 41405) were also utilized to assess potential economic effects of the critical habitat designation on private lands. This report uses this information to present an initial characterization of possible economic impacts associated with the designation of critical habitat for the Peninsular bighorn sheep.
- 5. Our final analysis will provide, to the extent possible, more rigorous estimates of expected economic impacts. Thus, we solicit information that can be used to support such assessment, whether associated with the categories of impact highlighted in this report, or other economic effects of the critical habitat designation. 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

Peninsular bighorn sheep, or of other Federal, Tribal, State, or local requirements that influence land use. The effects of listing include the take restrictions that result from the listing of a species as endangered or threatened, as well as the requirement that Federal agencies consult with the Service under section 7 of the Act on activities that may affect the species.

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 Peninsular bighorn sheep (*Ovis canadensis cremnobates*). 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 (the 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 over 875,000 acres of mountainous land in southern California as critical habitat for the Peninsular bighorn sheep (hereafter referred to as "bighorn sheep"). The proposed critical habitat encompasses dry regions with limited development in central Riverside County, eastern San Diego County, and western Imperial County. A large portion of the proposed critical habitat is State park land or designated wilderness areas. Any existing structures within the critical habitat area, such as residential development or canals that do not contain any of the primary constituent elements necessary to support the species, are not considered critical habitat. The critical habitat areas within the three counties are outlined below.

Riverside- Includes 245,000 acres of steep mountains south of the urbanized areas of the Coachella Valley, including the San Jacinto and Santa Rosa mountains and the Martinez Canyon. This portion of the proposed critical habitat provides land for the home ranges of four distinct ewe groups as well as corridors for possible connectivity between ewe groups. Recreation and development are the primary economic activities in this region.

San Diego- Includes almost 470,000 acres of mountainous regions of the Anza-Borrego Desert State Park and surrounding Bureau of Land Management and private lands. Specific mountain ranges include the San Ysidro, Vallecito, Tierra Blanca, and In-Ko-Pah mountains. The San Diego designation is home to seven distinct ewe groups. Recreation within the State park and surrounding wilderness areas is the primary economic activity.

Imperial- Includes over 160,000 acres in the Coyote Mountains and Fish Creek Mountains wilderness areas, as well as a small portion of the Anza-

Borrego State Park and the Torres Martinez Indian Reservation. Limited recreation, mining and grazing occurs in this region.

Framework and Economic Impacts Considered

- 9. This analysis defines an impact of critical habitat designation to include any effect the critical habitat designation has above and beyond the impacts associated with the listing of the species. To evaluate the increment of economic impacts attributable to the critical habitat designation, above and beyond the 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.
- 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 listing of the bighorn sheep (and listings for other relevant species) and modifications due to section 7 consultation on the impacts of the species, as well as other Federal, Tribal, 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 designation for the bighorn sheep, above and beyond any costs and benefits already in existence due to the listing of the species.
- 11. To estimate the incremental costs and benefits that critical habitat designation would have on existing and planned activities and land uses, the analysis applies the following framework:
 - 1. Develop a comprehensive list of possible Federal nexuses on Federal and Tribal lands in and around the proposed critical habitat area.
 - 2. Review historical patterns and current information describing the section 7 consultations in the proposed critical habitat area to evaluate the likelihood that nexuses would result in consultations with the Service.
 - 3. Determine whether specific projects and activities within the proposed critical habitat involve a Federal nexus and would likely result in section 7 consultations.
 - 4. Evaluate whether section 7 consultations with the Service would likely result in any modifications to projects, activities, or land uses beyond those required without critical habitat designation.
- 12. Using the framework outlined above, this analysis evaluates potential costs and benefits

associated with the proposed designation of critical habitat. Three primary categories of potential incremental costs are considered in the analysis. These categories include:

Costs associated with any modifications to projects, activities, or land uses resulting from the outcome of section 7 consultations beyond those required without critical habitat designation.

Costs associated with conducting reinitiations or extensions of existing section 7 consultations occurring under the listing, or with the incremental effort associated with new consultations (e.g., administrative effort).

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 project delays and changes in property values, regardless of whether critical habitat actually generates incremental impacts.

13. Potential economic benefits considered in this analysis include regional economic effects as well as changes in social welfare. For example, the existence of critical habitat for the bighorn sheep may enhance the region's economy by generating travel to the region and by increasing the region's desirability as a place to live. Social welfare may also be increased if the designation of critical habitat enhances the recovery of the species. Changes in social welfare can be measured through the existence value and non-consumptive use value people place on the bighorn sheep. 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 such impacts.

Preliminary Results

14. The preliminary results are as follows:

Few incremental consultations or other costs due to proposed critical habitat are expected to occur above and beyond those associated with the listing for the bighorn sheep. The two supporting factors are:

¹Existence value is the welfare associated with the knowledge of continued existence of a resource or species and non-consumptive use value is the welfare associated with wildlife viewing and other enhanced recreational activities that do not harm the species.

- i. A significant number of existing regulations and management plans in the baseline scenario already affect activities within the proposed critical habitat designation area, and
- ii. Most of the lands proposed for designation are in remote mountainous locations and do not support significant economic activity.

As noted above, while most of the proposed critical habitat designation contains remote areas, a small portion contains a developed area. Specifically, significant development pressures exist along the Coachella Valley in Riverside County, spurring building in the foothills. These projects can interfere with bighorn sheep habitat use, which if subject to a Federal nexus, would typically be consulted on with the Service under section 7 of the Act. The proposed designation of critical habitat may slightly increase the number of informal and formal consultations. As a result, the total cost of this increase to the Service, other Federal agencies, and applicants is estimated to range between \$500,000 and \$2 million.

Many residents and tourists use recreational trails within the proposed critical habitat designation. Federal, Trust, State and local landowners and managers have placed seasonal and spatial restrictions on recreational trail use as a result of habitat management plans, recovery plans and the listing of the bighorn sheep. Therefore, the Service believes that any ongoing restrictions would be attributable to the listing, not critical habitat designation.

Critical habitat designation may provide incremental benefits to certain land owners and managers beyond the benefits associated with the listing of the bighorn sheep. These benefits include the educational impact of delineating habitat for the bighorn sheep, increased Federal support for current bighorn sheep management activities, reduced uncertainty about extent of bighorn sheep habitat, and a potential increase in the probability of recovery for the bighorn sheep. Both increases in social welfare and enhancements to the regional economy are likely to be on the order of millions of dollars, but are difficult to accurately estimate.

Exhibit ES-1 summarizes these preliminary findings.

Exhibit ES-1

SUMMARY OF POTENTIAL CONSULTATIONS AND IMPACTS WITHIN PROPOSED CRITICAL HABITAT FOR THE PENINSULAR BIGHORN SHEEP

Type of Land Owner or Manager	Land Owner or Manager	Current or Future Activities that May Require Consultation	Federal Nexus	Potential for New or Reinitiated Consultations or Other Impacts Attributable to Critical Habitat*	Potential Benefits Attributable to Critical Habitat
Federal	Bureau of Land Management	Recreational trail management	Federal land ownership	Low	Increased support for current bighorn sheep management activities
		Land use permits	Federal land ownership	Low	Reduced uncertainty about extent of bighorn sheep habitat
		Research activities	Federal land ownership	Low	Increased support for current bighorn sheep management activities
		Management of grazing allotments	Federal land ownership	Low	Reduced uncertainty about extent of bighorn sheep habitat
	United States Forest Service	Management of grazing allotments	Federal land ownership	Low	Reduced uncertainty about extent of bighorn sheep habitat
		Recreational trail management	Federal land ownership	Low	Low
		Research activities	Federal land ownership	Low	Increased support for current bighorn sheep management activities
	Department of Transportation	Maintenance of Interstate 8	Federal land ownership/easement	Low	Reduced uncertainty about extent of bighorn sheep habitat
Trust	Morongo Tribe	None anticipated	Bureau of Indian Affairs oversight	Low	Low

Exhibit ES-1

SUMMARY OF POTENTIAL CONSULTATIONS AND IMPACTS WITHIN PROPOSED CRITICAL HABITAT FOR THE PENINSULAR BIGHORN SHEEP

Type of Land Owner or Manager	Land Owner or Manager	Current or Future Activities that May Require Consultation	Federal Nexus	Potential for New or Reinitiated Consultations or Other Impacts Attributable to Critical Habitat*	Potential Benefits Attri butable to Critical Habitat
	Agua Caliente Tribe	Recreational trail maintenance	Bureau of Indian Affairs oversight	Low	Increased support for current bighorn sheep management activities
Trust	Agua Caliente Tribe	Management of Indian Canyons	Bureau of Indian Affairs oversight	Low	Increased support for current bighorn sheep management activities
		Habitat management	Bureau of Indian Affairs oversight	Low	Increased support for current bighorn sheep management activities
	Torres Martinez Tribe	Habitat management	Bureau of Indian Affairs oversight	Low	Increased support for current bighorn sheep management activities
State and Local	CA Department of Parks and Recreation	Acquisition of land along highways	Use of U.S. Department of Transportation grants	Low	Increased support for current bighorn sheep management activities
	CA Department of Fish and Game	Research activities	University of California system Federal funding	Low	Increased support for current bighorn sheep management activities
	CA Department of Transportation	Road maintenance	Use of U.S. Department of Transportation funding	Low	Reduced uncertainty about extent of bighorn sheep habitat
	Coachella Valley Water District	Delivery of irrigation and domestic waters	Section 404 permit	Low	Low

Exhibit ES-1

SUMMARY OF POTENTIAL CONSULTATIONS AND IMPACTS WITHIN PROPOSED CRITICAL HABITAT FOR THE PENINSULAR BIGHORN SHEEP

Type of Land Owner or Manager	Land Owner or Manager	Current or Future Activities that May Require Consultation	Federal Nexus	Potential for New or Reinitiated Consultations or Other Impacts Attributable to Critical Habitat*	Potential Benefits Attri butable to Critical Habitat
		Construction and maintenance of water works	Located on BLM lands	Moderate- informal and formal consultations and project modifications	Reduced uncertainty about extent of bighorn sheep habitat, educational benefits of conversations, potential increase in the probability of recovery for the bighorn sheep
State and Local	Riverside County Regional Parks	Recreation activities	Use of Bureau of Reclamation water	Low	Increased support for current bighorn sheep management activities
Private	Private landowners	Residential and commercial development	Section 404 permit	Moderate- informal and formal consultations and project modifications	Reduced uncertainty about extent of bighorn sheep habitat, educational benefits of conversations, potential increase in the probability of recovery for the bighorn sheep
	Private landowners	Railroad operation	U.S. Department of Transportation licencing	Low	Reduced uncertainty about extent of bighorn sheep habitat

Sources: Information in table based on personal communications with Service Field Biologist, Carlsbad, California Office, August-October 2000, and other stakeholders (see footnotes and References)

^{*} Note: Any potential new or reinitiated consultation or other impact attributable to critical habitat presumes a pre-existing Federal nexus as identified in the preceding column.

1 INTRODUCTION SECTION 1

15. On March 18, 1998, following a review of information and public comments received on the proposed rule, the U.S. Department of the Interior's Fish and Wildlife Service (the Service) listed the Peninsular bighorn sheep (*Ovis canadensis cremnobates*) as an endangered species (63 FR 13134). In this rule, the Service found that designation of critical habitat was not prudent because the Service believed critical habitat could increase threats to the species and would not provide any additional benefit beyond that provided by the listing. On December 18, 1998, the Southwest Center for Biological Diversity and Desert Survivors filed a complaint against the Service alleging that the Service's not prudent findings were unsubstantiated. The Service reconsidered the question of critical habitat as part of the settlement order pursuant to this lawsuit in September 1999. Upon further consideration, the Service decided there may be some benefit to designation of critical habitat for the bighorn sheep, and proposed critical habitat for the bighorn sheep on July 5, 2000.

16. 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 are essential. Critical habitat designation contributes to Federal land management agencies' and the public's awareness of the importance of these areas.

17. In addition to its informational role, the designation of critical habitat may provide protection 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 listing of a species, Federal agencies must consult with the Service regarding any activities that may affect a listed species. Under section 7, each Federal agency shall ensure that their action is not likely to jeopardize the continued existence of the species. The regulations of the Act define jeopardy as any action that would appreciably reduce the likelihood of both the survival and recovery of the species. 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.

18. The designation of critical habitat affects lands both within the geographical area occupied by the species and outside the geographical area occupied by the species. Critical habitat is defined in the Act as the specific areas within the geographical area occupied by the species on which are found the physical or biological features that (1) are essential to the conservation of the species, and (2) that may require special management considerations or protection. Areas outside the geographical range occupied by the species also may be included in the designation of critical habitat when the Service determines that they are essential for the conservation of the species. Federal agencies will have to consult with the Service regarding any activities they fund, authorize, or carry out on areas within the geographical range occupied by the species and areas outside the geographical range occupied by the species that may destroy or adversely modify critical habitat. Already, they must consult with the Service on activities in these areas that may jeopardize the bighorn sheep.

1.1 CONSULTATION UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT

- 19. 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. Activities on land owned by individuals, organizations, States, local and Tribal governments only require consultation with the Service if their actions occur on Federal lands (e.g., grazing permit); require a Federal permit, license, or other authorization; or involve Federal funding. Federal actions not affecting the species or its critical habitat, as well as actions on non-Federal lands that are not Federally funded, authorized, or permitted, will not require section 7 consultation.
- 20. For consultations concerning activities on Federal lands, therelevant 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.
- 21. 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.² 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.

- 22. 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.
- 23. 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 jeopardy to 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.
- 24. 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 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.

² Many 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.

1.2 PURPOSE AND APPROACH OF ECONOMIC ASSESSMENT

- 25. Under the regulations of 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 and to consider 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 Peninsular bighorn sheep.
- 26. The analysis must distinguish between economic impacts caused by the listing of the bighorn sheep and those additional effects that would be caused by the proposed critical habitat designation. The analysis only evaluates economic impacts resulting from critical habitat designation that are above and beyond impacts caused by the listing of the bighorn sheep. In the event that a land use or activity would be limited or prohibited by another existing statute, regulation, or policy, the economic impacts associated with those limitations or prohibitions would not be attributable to critical habitat designation.
- 27. This analysis assesses how critical habitat designation for the bighorn sheep may affect current and planned land uses and activities on Federal, Trust, State, county, local, and private land. For federally-managed land, designation of critical habitat may modify land uses, activities, and other actions that may adversely modify habitat. For Trust, State, county, local, 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). Activities on State and private land that do not involve a Federal nexus are not affected by critical habitat designation.
- 28. To be considered in the economic analysis, activities should be reasonably foreseeable, which this analysis defines as activities which are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. This analysis considers all reasonably foreseeable activities on proposed critical habitat areas. Current and future activities that could potentially result in section 7 consultations and/or modifications are considered.

1.3 STRUCTURE OF REPORT

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

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 socio-economic

information describing the baseline, that is, the "without critical habitat" scenario.

Section 3: Analytic Framework and Results - Describes the framework and methodology for the analysis, and provides preliminary findings of potential incremental costs and benefits resulting from the proposed designation.

2 SPECIES DESCRIPTION AND RELEVANT BASELINE INFORMATION³

SECTION 2

2.1 DESCRIPTION OF SPECIES

- 30. The Peninsular bighorn sheep is a large mammal with a pale brown coat and yellowish brown to dark brown horns. The permanent horns are massive and coiled in males and smaller and not coiled in females. In comparison to other desert bighorn sheep, the Peninsular bighorn sheep is generally described as having paler coloration and horns with very heavy bases. The bighorn sheep's diet includes a wide variety of plant species, consisting of shrubs, herbaceous annuals and perennials, cacti, and grasses.
- 31. Bighorn sheep typically produce only one lamb per year. Lambing occurs primarily in February, March and April, but may occur as early as January and as late as August. Lambs and ewes frequently occupy steep terrain that provides escape from predators and cover from excessive heat and tend to congregate near dependable water sources during the summer. Lambs are able to eat native grass within two weeks of their birth and are weaned between four and six months of age. Lambing areas are particularly sensitive to human disturbance and thus represent vitally important areas within the proposed critical habitat designation.
- 32. Bighorn sheep occur on steep, open slopes, canyons, and washes in hot and dry desert regions where the land is rough, rocky, and sparsely vegetated. Most of these sheep live between 300 and 4,000 feet in elevation, where average annual precipitation is less than four inches and daily high temperatures average 104 degrees Fahrenheit in the summer. Caves and other forms of shelter (e.g., rock outcrops) are used during inclement weather. Lambing areas are associated with ridge benches or canyon rims adjacent to steep slopes or escarpments. Alluvial fans (sloping masses of gravel, sand, clay, and other sediments that widen out like fans at the base of canyons and

³ The information on the Peninsular bighorn sheep and its habitat included in this section was obtained from the *Proposed Determination of Critical Habitat for the Peninsular Bighorn Sheep* (Proposed Rule), July 5, 2000 (65 FR 41405).

washes) are also used for breeding, feeding, and movement.

- 33. The distribution of bighorn sheep is not solely dependent on isolated habitat features, but requires a continuum of essential resources that allows the species to adapt to environmental processes. Bighorn ewes exhibit a high degree of site fidelity to their home range, which is learned at an early age. Ewes that share a portion of a range are likely to be more closely related to each other and are called "ewe groups." Bighom rams exhibit less site fidelity and tend to range more widely, moving among ewe groups. These characteristics make the bighorn sheep a metapopulation, which is a group of smaller populations that occasionally exchange individuals and/or genetic material.
- 34. Considering these and other attributes, habitat requirements, and population biology, the Service has determined several primary constituent elements for the Peninsular bighorn sheep. The primary biological and physical constituent elements that are essential to the conservation of the bighorn sheep include:

Space for the normal behavior of groups and individuals;

Protection from disturbance;

Availability of a variety of native desert vegetation, including alluvial habitat that provides essential seasonal forage;

A range of habitats that provide forage during periods of environmental stress, such as drought or predation;

Steep, remote habitat for lambing, rearing of young, and escape from disturbance and/or predation;

Reliable water sources:

Suitable corridors allowing individual bighorn to move freely between ewe groups; and,

Space and the essential habitat components to accommodate a recovered population.

35. The areas that the Service is proposing for designation as critical habitat provide one or more primary constituent elements or will be capable, with restoration, of providing them.

2.2 PROPOSED CRITICAL HABITAT UNITS

36. Exhibit 2-1 shows the proposed critical habitat in the mountainous regions in San Diego, Riverside and Imperial Counties in California. The proposed designation encompasses approximately 876,000 acres of hot, dry, and sparsely vegetated desert regions. Because bighorn sheep often move great distances, all proposed critical habitat is believed to be currently occupied and necessary to maintain connectivity between bighorn ewe groups.

37. Exhibit 2-2 shows the acreage associated with Federal, Trust, State and local, and private lands. The majority of the proposed critical habitat designation is in western San Diego County, and over half is on State and local land.

Exhibit 2-2								
PROPOS	PROPOSED CRITICAL HABITAT ACREAGE BY MANAGER, HOLDER OR OWNER							
	Riverside (Percent of County total)	San Diego (Percent of County total)	Imperial (Percent of County total)	Total (Percent of total designation)				
Federal Government	98,135 (40%)	49,699 (11%)	103,808 (64%)	251,642 (29%)				
Trust	16,293 (7%)	0	4,168 (3%)	20,461 (2%)				
State and Local Government	43,801 (18%)*	377,677 (81%)	32,126 (20%)	453,604 (52%)				
Private Entity	87,121 (36%)	40,143 (9%)	22,642 (14%)	149,906 (17%)				
Total	245,350	467,519	162,744	875,613				

Source: Proposed Determination of Critical Habitat for Peninsular Bighorn Sheep (65 FR 41405)

After confirming with the Service, it was determined the correct number is 43,801 acres.

Note: Percentages may not sum to 100 percent due to rounding error.

38. A more detailed description of physical attributes and specific landowners of the critical habitat in each county is provided below:

Riverside. The critical habitat designation in Riverside County includes the steep mountains south of the urbanized areas of the Coachella Valley, including the San Jacinto and Santa Rosa mountains and the Martinez Canyon. This portion of the proposed critical habitat provides land for the home ranges of four distinct ewe groups as well as corridors for possible connectivity between ewe groups. Specific land parcels in this region include portions of the Agua Caliente and Morongo Reservations, the Santa Rosa Wilderness, the San Bernardino National Forest, Lake Cahuilla Regional Park, and land under private ownership.

San Diego. The critical habitat designation in western San Diego County includes a majority of the mountainous regions of the Anza-Borrego Desert State Park. Specific mountain ranges include the San Ysidro, Vallecito,

^{*} Note: According to the Proposed Rule, the amount of State and local land in Riverside County is 43,081 acres.

Tierra Blanca and In-Ko-Pah mountains. The San Diego designation is home to four distinct ewe groups. In addition to the Anza-Borrego State Park, the critical habitat boundaries include the Sawtooth Mountains and Carrizo Gorge wilderness areas.

Imperial. The critical habitat designation in Imperial County includes the Coyote Mountains and Fish Creek Mountains wilderness areas, as well as a small portion of the Anza-Borrego State Park and the Torres Martinez Indian Reservation. The Service believes a portion of the critical habitat designation south of the I-8 highway in the Jacumba Wilderness may be unoccupied because the highway acts as a barrier to sheep movement. The Service included this area in critical habitat because the Service hopes to create corridors under or over I-8, enabling the California bighorn sheep populations to intermingle with Mexican populations.

2.3 RELEVANT BASELINE INFORMATION

39. This section provides relevant information about existing regulations and requirements that exist in the baseline, i.e., the "without critical habitat" scenario. In addition, relevant information about the socio-economic characteristics of regions that include critical habitat are provided.

2.3.1 Baseline Statutory and Regulatory Requirements

40. _____The baseline requirements include regulations regarding the listing of the bighorn sheep and other species, the draft Bighorn Sheep Recovery Plan, and relevant statutes, regulations and memoranda.

Listing

In March 1998, the Service listed the bighorn sheep as an endangered species. Under the listing, Federal agencies must consult with the Service regarding any actions they fund, authorize, or carry out that could potentially jeopardize the continued existence of the proposed species. The listing of the bighorn sheep 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. This analysis seeks to recognize those impacts or potential modifications to activities above and beyond those attributable to the listing of the bighorn sheep.

Overlap with Other Listed Species

42. Service Field Office staff in California indicate that habitat for the federally listed Least Bell's vireo, southwestern willow flycatcher, desert tortoise, triple-ribbed milk vetch, and desert slender salamander overlap with much of the proposed bighorn sheep critical habitat. The Service currently requires consultations associated with these species' listing. Generally, 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. This has the potential to reduce the total number of consultations necessary for a project. Yet, even when consultations include more than one species, the Service and the Action agency must consider all potential impacts on each species and their habitats separately. Therefore, the amount of research and time spent in consultation will be same regardless of whether consultations are held jointly for several species. The net effect of the presence of other federally listed species in the proposed bighorn sheep critical habitat is that the number of separate section 7 consultations may be reduced, but the total amount of research and time spent in consultation will remain approximately the same.

Recovery Plan

- 43. An important component of the baseline scenario is the *Draft Recovery Plan for the Bighorn Sheep in the Peninsular Ranges* (Recovery Plan) published in December 1999.⁴ The Recovery Plan includes a map delineating "essential habitat" for the bighorn sheep as well as the methodology employed in determining its extent. The essential habitat is contained within the proposed critical habitat designation, which establishes a legally defined boundary around essential habitat. While this draft Recovery Plan imposes no binding restrictions on landowners and managers in the proposed critical habitat designation, it serves as an important information source for landowners regarding bighorn sheep habitat.
- 44. The Service has and likely would require section 7 consultations for projects that have a Federal nexus and occur within the essential habitat boundary delineated in the Recovery Plan. Thus, on critical habitat areas that are also considered essential habitat, nearly all economic costs or benefits associated with section 7 consultations may be attributed to the designation of essential habitat in the draft Recovery Plan. Similarly, any indirect effects of the designation and publishing of habitat for the bighorn sheep, such as changes in property values or biological surveys conducted to dispute the occupied status of a portion of land, can be attributed to the publishing of the boundaries of the essential habitat in the Recovery Plan (i.e., the effects would have occurred even in the absence of the designation of critical habitat).

⁴U.S. Fish and Wildlife Service, *Draft Recovery Plan for the Bighorn Sheep in Peninsular Ranges*, 1999.

State Statutes and Regulations

- 45. In addition to Federal listing of the bighorn sheep as endangered, the California Fish and Game Commission listed the Peninsular bighorn sheep as threatened under the California Endangered Species Act on June 27, 1971. Legally, the California Endangered Species Act forbids any loss of habitat for endangered or threatened species without a permit. The Service is unaware of any restrictions or modifications that have been enacted by the State of California to date for projects that could degrade or diminish the extent of the bighorn sheep habitat.
- 46. Other relevant State statutes include the California Environmental Quality Act (CEQA), which requires identification of significant environmental effects of proposed projects that have the potential to harm the environment. The lead a gency (typically the California State agency in charge of the oversight of a project) must determine whether a proposed project would have a "significant" effect on the environment. Section 15065 of Article 5 of the CEOA regulations states that a finding of significance is mandatory if the project will "substantially reduce the habitat of a fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory." If the lead agency finds a project will cause significant impacts, the landowners must prepare a Environmental Impact Report (EIR).⁶ Any economic impacts identified by the EIR process are due to the presence of a particular species on the project land, regardless if it is designated critical habitat. Review of the CEQA statute and conversations with the California Resources Agency (one of the agencies responsible for administering CEQA) revealed that when a species is known to occupy a parcel of land, the designation of critical habitat alone does not require a lead agency to pursue any incremental actions. In the case of the bighorn sheep, the designation of "essential" habitat in the recovery plan made public the lands occupied by the bighorn sheep. Therefore, economic impacts generated by CEQA on essential habitat areas are part of the baseline and not attributable to the designation of critical habitat.

⁵California Resources Agency, Department of Fish and Game, "State and Federally Listed Endangered and Threatened Animals of California," July 2000, http://www.dfg.ca.gov/whdab/Animal2000_July.pdf, August 22, 2000.

⁶California Resources Agency, "Summary and Overview of the California Environmental Quality Act", November 12, 1998, http://ceres.ca.gov/topic/env_law/ ceqa/summary.html, August 23, 2000.

⁷Personal communication with the California Resources Agency Office on September 11, 2000.

- A7. Relevant case law supports the idea that the designation of critical habitat for a species does not require any additional actions by a lead agency or an applicant when the project is on land that is known to be occupied by a species. The October 1995 Fort Mojave Indian Tribe v. California Department of Health Services (38 Cal.App.4th 1574) concerns the CA Department of Health Services (DHS) approval of an EIR for the construction and operation of a low-level radioactive waste disposal facility. In this case the Plaintiff argued that the DHS should have resubmitted the EIR for public comment after the Service designated the project site as critical habitat for the Desert tortoise. Their argument centers around the idea that the designation of critical habitat constituted new circumstances requiring the DHS to recirculate the EIR or prepare a supplemental EIR. The court found that this contention lacked merit, because the designation of critical habitat did not present evidence of significant new or enhanced environmental effects of the project. The presence of the Desert tortoise was already known and addressed in the original EIR. Thus, the designation of critical habitat did not introduce any new information of effects into the CEQA review process.
- 48. The designation of critical habitat for the bighorn sheep is similar to the designation of critical habitat for the Desert tortoise in this court case. Almost all of the critical habitat is known to be occupied by the bighorn sheep due to the designation of essential habitat in the Recovery Plan. However, on critical habitat areas that are *not* part of essential habitat, the designation of critical habitat may trigger effects associated with CEQA. A discussion and quantification of these effects are presented in Section 3.

Department of the Interior Secretarial Orders

- 49. Department of the Interior Secretarial Order #3206, *American Indian Tribal Rights, Federal-Tribal Trust Responsibilities*, and the Endangered Species Act, clarifies the Service responsibilities when actions taken under the authority of the Endangered Species Act affect Indian lands and tribal trust resources. The Order requires the Service to work with Indian Tribes to promote healthy ecosystems; recognize that Indian lands are not subject to the same controls 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. These principles provide guidelines for interactions between the Service and Indian Tribes in reference to critical habitat.
- 50. The Appendix to the Order provides specific policy guidance. Section 3 (C) of the Appendix states that the Service:

Solicit information and knowledge from affected Indian Tribes during the

⁸Department 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.

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 licence or permit applicant;

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 for project modifications, give full considerations to all comments and information received from any affected Tribe.

The Service is currently precluded from implementing the above guidance under its current appropriations. However, the Service does implement the policy set forth in the Presidential Memorandum of April 29, 1994 as part of its current program to protect the bighorn sheep. This Presidential Memorandum requires the Service to consult with the Tribes on matters that affect them. In addition, section 4(b)(2) of the Act requires the Service to gather information regarding the designation of critical habitat and the effects thereof from all relevant sources, including the Tribes.

2.3.2 Socioeconomic Profile of the Critical Habitat Areas

52. To provide context for the discussion of potential economic impacts due to proposed critical habitat, this section summarizes key economic and demographic information for the three counties containing proposed critical habitat for the bighorn sheep.¹⁰ County level data are provided to

⁹Presidential Memorandum, *Government-to-Government Relations with Native American Tribal Governments*, April 29, 1994.

¹⁰Population and housing summaries are derived mainly from: State of California, Department of Finance, *City/County Population and Housing Estimates, 1991-2000, with 1990 Census Counts.* Other statistics are derived from the U.S. Bureau of Economic Analysis Regional Facts, *http://www.bea.doc.gov/bea/regional/bearfacts/bf10/06/index.htm*, September 6, 2000, and the *1997 County and City Extra*, George Hall and Deirdre Gaquin, editors (Bernan Press, MD) 1997.

convey the nature of the regional economy. However, these data may not accurately reflect the socioeconomic characteristics of the critical habitat area because the majority of the proposed critical habitat is in the sparsely populated or uninhabited regions of the counties. Therefore, when available, data from areas within or bordering on the proposed designation are provided in addition to the county level data.

Riverside

- 53. The majority of the proposed critical habitat for the bighorn sheep lies within the Coachella Valley, located in Riverside County. The Valley has undergone a significant economic transition during the last 40 years. Specifically, the agricultural economy has given way to an economy based primarily on tourism. The area's growing popularity as a resort community, principally marketed around golf, has prompted a dramatic increase in the retail and service sectors. Currently, the retail and services industry accounts for almost 60 percent of total employment.¹¹
- Riverside ranks as the sixth most populous county in the State of California. Riverside's 2000 population exceeds 1.5 million and accounts for about 5.5 percent of the State total. This population is spread over 7,200 square miles with an average density of 212 people per square mile. Since 1990, its average annual population growth rate has been about 3.0 percent, which is twice the State average of 1.5 percent. For the most part, Riverside County has been experiencing rapid development compared to the rest of California. Over the past year, while its population growth rate fell slightly to 2.8 percent, the housing stock growth rate continued to rise to 2.3 percent.
- In 2000, Riverside County had approximately 582,419 housing units. ¹² This represents an average annual growth rate of about 2.0 percent since 1990, which is about twice the State average of 0.9 percent. Several municipalities within the vicinity of proposed Bighorn sheep critical habitat exceed the County's average growth rate. These include Coachella (2.8 percent), La Qunita (8.9 percent), and Palm Desert (5.8 percent). The housing growth rate in other Riverside County municipalities within the vicinity of proposed critical habitat for the sheep include Cathedral City (1.8 percent), Indian Wells (2.4 percent), and Rancho Mirage (1.3 percent).

¹¹Rancho Mirage, "Community Economic Profile, Riverside County," *http://www.ranchomirage.org/economic.htm*, September 6, 2000.

¹²State of California, Department of Finance, "City/County Population and Housing Estimates," 1991-2000, with 1990 Census Counts.

- 56. In 1998, Riverside had a total personal income (TPI) of \$33.2 billion, which equates to a per capita personal income (PCPI) of \$22,451.¹³ Riverside's PCPI ranked 29th in the State and was 80 percent of the State average (\$28,163) and 83 percent of the national average (\$27,203). In 1988, the PCPI of Riverside was \$17,872 and ranked 20th in the State. The average annual growth rate of PCPI over the past ten years was 2.3 percent, which is below the average annual growth rate for the State (3.6 percent) as well for the nation (4.6 percent).
- 57. Total earnings of persons employed in Riverside increased from about \$8.6 billion in 1988 to \$16.3 billion in 1998, an average annual growth rate of 6.6 percent. The largest industries in 1998 were services (23.3 percent of earnings), State and local government (16 percent of earnings), and construction (12.8 percent of earnings). In 1988, the largest industries were farm (32.4 percent); State and local government (17.2 percent); and services (12.3 percent).
- 58. Riverside County's tremendous growth in housing units and transition from an agricultural economy to an economy based on tourism has significant implications for the economic activity within and around the proposed critical habitat designation. Due to spatial constraints on the Coachella Valley floor, developers are planning resort and housing developments near the base of the mountains and in the foothills, encroaching on bighorn sheep habitat. Because of this intense development pressure, most of the potential impacts of the critical habitat designation for the bighorn sheep are likely to occur in Riverside County, as opposed to the other counties.

San Diego

San Diego is the second most populous county in the State of California. In 2000, its population of slightly more than 2.9 million accounted for about 8.5 percent of the State total. The estimated average population density for San Diego County is 671 people per square mile. Since 1990, its average annual population growth rate has been about 1.7 percent, which is similar to the State average of 1.5 percent. In 2000, San Diego Countyhad a little more than one million housing units. This represents an average annual growth rate of about 1.0 percent since 1990, which is about equal to the State average. San Diego's growth is focused on the western region of the County. The eastern region, which is where the proposed critical habitat is being designated, is mostly California State Parkland.

¹³Total personal income includes the earning (wages and salaries, other labor income, and proprietor's income); dividends, interest, and rent; and transfer payments received by the residents of Imperial.

¹⁴State of California, Department of Finance, "City/County Population and Housing Estimates," 1991-2000, with 1990 Census Counts.

- 60. In 1998, San Diego had a TPI of \$76.5 billion, which equates to a PCPI of \$27,657. San Diego's PCPI ranked 15th in the State and was 98 percent of the State average (\$28,163) and 102 percent of the national average (\$27,203). Over the past ten years, the average annual PCPI growth rate was 3.7 percent compared to a State average of 3.6 percent and national average of 4.6 percent.
- Total earnings of persons employed in San Diego increased from \$32.8 billion in 1988 to \$54.4 billion in 1998, an average annual growth rate of 5.2 percent. The largest industries in 1998 were services (30.7 percent of earnings); State and local government (10.8 percent); and retail trade (9.4 percent). In 1988, the largest industries were services (24.5 percent of earnings); military (13.3 percent); and durable goods manufacturing (10.6 percent).
- 62. A vast majority of San Diego County's economic activity described above occurs in the western coastal regions of the County. Over 90 percent of the land within the critical habitat designation is State park land or Bureau of Land Management wilderness area. Only a few small housing developments near Borrego Springs exist within the critical habitat borders. Thus, critical habitat will most likely have limited effects on the population and regional economy of San Diego County.

Imperial County

- As of January 1, 2000 Imperial County's population was 145,285 residents, with an average population density of 35 people per square mile. Since 1990, its average annual population growth rate has been about 3.3 percent, which is greater than the State average of 1.5 percent. In fact, Imperial County has experienced the greatest population percentage growth of any county in the region over the past decade. In 2000, Imperial County had approximately 43,470 housing units. This represents an average annual growth rate of about 1.9 percent since 1990, more than the State rate of 0.9 percent. The fastest growing cities within Imperial County, in terms of housing units, were Imperial (9.0 percent average annual growth rate) and Calexico (4.0 percent), which are not located within the vicinity of proposed critical habitat. Recently, Imperial County's growth has slowed. Over the past year, population has grown only 0.5 percent, while housing has grown by only 0.9 percent.
- 64. In 1998, Imperial had a TPI of \$2.5 billion, which equates to a PCPI of \$17,353. Imperial's PCPI was only 62 percent of the State average (\$28,163) and 64 percent of the national average (\$27,203). Over the past ten years, the average annual PCPI growth rate for Imperial County was 1.3 percent compared to the State average annual PCPI growth rate of 3.6 percent and the nation's 4.6 percent rate.
- 65. Total earnings of persons employed in Imperial County increased from \$1.2 billion in 1988 to \$1.8 billion in 1998, an average annual growth rate of 4.0 percent. The largest industries in 1998 were State and local government (23.9 percent of earnings); farm (22.5 percent); and services (12.2

percent). In 1988, the largest industries were farm (32.4 percent of earnings); State and local government (17.2 percent); and services (12.3 percent).

66. Similar to San Diego County, the economic activity within the proposed critical habitat designation in Imperial County is currently limited. A few small housing developments exist near Desert Shores on the Salton Sea. However, Imperial County's large population growth may increase development pressures in areas adjacent to or within the proposed critical habitat designation.

3 ANALYTIC FRAMEWORK AND RESULTS

SECTION 3

67. This section provides an overview of the framework for the analysis, a description of information sources used, and a discussion of potential economic costs and benefits associated with the proposed designation of critical habitat for the Peninsular bighorn sheep.

3.1 FRAMEWORK FOR ANALYSIS

68. This economic analysis examines the impacts of modifications to specific land uses or activities within those areas designated as critical habitat. The analysis evaluates impacts in a "with" critical habitat designation versus a "without" critical habitat designation framework, measuring the net change in economic activity attributable to the critical habitat proposal. The "without" critical habitat designation scenario, which represents the baseline for analysis, includes all protection already accorded to the species under State and Federal laws, such as the National Environmental Policy Act and the California Environmental Quality Act. 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 for the species. The listing of the bighorn sheep 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.

3.1.1 Categories of Economic Impacts

69. 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 that are above and beyond those that result from existing Federal, Tribal, State, and local laws. This analysis considers any incremental costs and benefits resulting from the proposed critical habitat designation. Exhibit 3-1 outlines the general categories of costs and benefits considered in this analysis.

	Exhibit 3-1						
PO	POTENTIAL ECONOMIC IMPACTS THEORETICALLY DUE TO CRITICAL HABITAT						
	Categories of Costs and Benefits	Examples					
Costs	Costs associated with section 7 consultations: new consultations reinitiated consultations extended consultations	Administrative costs (e.g., phone calls, letter writing, meetings, travel time, biological assessment) required to conduct consultation.					
	Costs associated with uncertainty and perceptions of critical habitat effects: project delays changes in property values	Transitory decline in value of properties within critica habitat, based on the public's perception that critical habitat will result in project modifications.					
	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).					
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.					

70. 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 species, and (2) modifications to land uses and activities as a result of consultations. The Service has recognized that there are approximately three different scenarios associated with the designation of critical habitat that could trigger incremental consultation costs:

Some consultations that have already been "completed" may need to be reinitiated to address critical habitat;

Consultations taking place after critical habitat designation may take longer because critical habitat issues will need to be addressed;

New consultations that would not have taken place but for designation of critical habitat.

- about the impact of critical habitat on particular parcels subject to the designation. Public perception that critical habitat results in project modifications could 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, though the area may actually be safe, can negatively influence the value of individual properties in the neighborhood. Often, a single event or series of events (for example, the publication of a newspaper article or a succession of crimes) create a change in public attitudes which in turn cause a change in the value of property. As more information on actual neighborhood attributes becomes available to the market over a period of time, the influence of the public's initial perception subsides. Although originating in perceived (as opposed to actual) changes, a similar pattern of public attitudes about the influence of critical habitat could cause real economic effects. They may occur even in cases in which additional project modifications on land uses within critical habitat are unlikely to be imposed.
- 72. Uncertainty about the impacts of critical habitat also could result in costs to landowners. For example, uncertainty surrounding the definition of critical habitat could prompt some landowners to undertake steps to reduce that uncertainty, thereby incurring transaction costs. Specifically, landowners may elect to retain legal and technical counsel, surveyors and other specialists to determine whether specific parcels lie within critical habitat boundaries, and/or whether the primary constituent elements are present on parcels. Thus, uncertainty over the critical habitat status of lands has the potential to create real economic losses as land owners incur costs to reduce and/or mitigate the effects of this uncertainty. Moreover, uncertainty may create delays, or in some cases, may lead to changes in land use decision-making, and may thereby result in opportunity costs.
- habitat, this analysis also considers economic benefits that may result from designation of critical habitat. Resource preservation or enhancement, which is aided by designation of critical habitat, may constitute an increase in the values provided directly by the species and indirectly by its habitat. Categories of potential benefits for the bighorn sheep 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 listing. Finally, the public's perception of the potential importance of critical habitat may result in increases in some property values, just as the perception of modifications may result in property value reductions, regardless of whether critical habitat generates such impacts.¹⁵

¹⁵For example, a development that abuts State park land may benefit if the public perceives critical habitat as providing additional conservation protection to the park.

3.1.2 Methodological Approach

As discussed in Section 1, critical habitat can only affect current or planned land uses where a Federal nexus is involved. 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. Activities on Trust, State, county, municipal, and private lands that do not involve a Federal nexus are not affected by the designation of critical habitat. As a result, this report assesses potential economic impacts from critical habitat by first identifying those activities that will likely involve a Federal nexus. Once probable Federal nexuses are identified, specific examples of these nexuses within the proposed critical habitat are identified and evaluated to determine the likelihood of incremental consultations and the probability of resultant project modifications or other costs or benefits. Below, the specific steps used in this methodology are described:

First, identify potential Federal nexuses in area of concern. Develop comprehensive list of possible nexuses on Federal, Trust, State, county, municipal, and private lands in and around proposed critical habitat for the bighorn sheep.

- i. For federally owned lands, review current and future activities that may impact the proposed critical habitat. Since all activities on Federal lands are subject to section 7 consultation, identify major activities that could result in adverse modification
- ii. For non-Federal lands, review whether proposed activities on affected State, county, municipal or private lands potentially involve Federal permits, Federal funding, or other Federal involvement.

Second, review historical patterns for section 7 consultations in the proposed critical habitat area to determine the likelihood that nexuses are likely to result in consultations with the Service. However, as historical patterns are not totally accurate predictors of future events, also use current information and professional judgement of the Service and other Federal agency staff, regarding the likelihood of new, reinitiated, or extended incremental consultations.

Third, identify specific projects and activities that involve a Federal nexus in proposed critical habitat area and will likely result in section 7 consultations with the Service, based on current and historical information.

Fourth, evaluate the probable impacts of any modifications resulting from consultation outcomes, as well as other incremental costs and benefits that may originate from the proposed designation (e.g., project delays, change in property values, enhanced recreational opportunities).

3.1.3 Information Sources

75. The methodology outlined above relies primarily on input and information from the Service staff. Because the *Proposed Determination of Critical Habitat for the Peninsular Bighorn Sheep* (65 FR 41405) (Proposed Rule) designating critical habitat was released just prior to the time of this analysis, only limited numbers of public comments and detailed information from landowners on specific activities and land uses were available. As such, this preliminary analysis relies primarily on meetings and telephone conversations with staff at the Service, and other Federal, Tribal, State and local government agencies rather than on written comments or public hearing testimony. The final analysis will consider additional public comments and more detailed interviews with key Federal, State, and local government stakeholders. Relevant contacts will be identified in coordination with the Service to ensure that the most relevant and knowledgeable parties are consulted.

3.2 POTENTIAL FEDERAL NEXUSES WITHIN CRITICAL HABITAT

- 76. As outlined above, the first step in assessing potential impacts due to critical habitat for the Peninsular bighorn sheep involves identification of the potential Federal nexuses within the affected area. This step includes a review of land ownership within the critical habitat. Proposed critical habitat for the bighorn sheep, which includes areas in Riverside, San Diego and Imperial Counties is comprised of a mix of Federal, Trust, State and local, and private land. In addition, potential Federal nexuses within the proposed critical habitat are identified based on guidance from field and regional Service staff in California. Both current and future nexuses potentially occurring within critical habitat for the bighorn sheep are identified, in order to develop a comprehensive list of all activities in the affected area that require Federal involvement in some form.
- 77. Beyond identifying all potential Federal nexuses on the lands proposed as critical habitat for the bighorn sheep, this analysis assesses the likelihood that section 7 consultations for different categories of Federal nexuses will be exercised. This assessment is a critical part of the overall economic analysis of critical habitat because historical evidence suggests that there are categories of Federal nexuses for which section 7 consultation rarely, if ever, occurs. The information for this assessment is based on input and guidance from field and regional the Service staff, as well as historical patterns in consultations between the Service and Federal agencies in the proposed areas. Exhibit 3-2 identifies Federal agencies with nexuses in the proposed critical habitat, describes the individual nexuses, and evaluates whether each nexus has historically resulted in section 7

consultation. This analysis focuses on identifying specific land use activities in the affected areas that are most likely to result in section 7 consultation.

Exhibit 3-2							
POTENTIAL FEDERAL NEXUSES WITHIN CRITICAL HABITAT FOR THE PENINSULAR BIGHORN SHEEP							
Federal Agency	Has Nexus Historically Occurred and/or Resulted in Consultation?						
Bureau of Land Management	Management of recreational trails and grazing allotments, road maintenance, permitting land use, and research activities	Yes					
U.S. Forest Service	Yes						
Department of Transportation	Maintenance of interstate highways, funding of California Department of Transportation, and licensing of railroads	Sometimes					
Bureau of Indian Affairs	Management of trails, roads, and development on Tribal lands	Sometimes					
Army Corps of Engineers	Authorization and permitting of dredging and filling of wetlands, channelization of streams, flood control actions, and sand and gravel operations under Section 404 of the Clean W ater Act.	Yes					
Bureau of Reclamation	Authorization, licensing, and operation of water pipelines and reservoirs.	Rarely					
Environmental Protection Agency	Permitting of municipal and industrial discharges under the National Pollutant Discharge Elimination System (NPDES).	Rarely					
Source: Personal comn	nunication with Field Biologist, Carlsbad, CA Office on Aug	gust 24, 2000					

78. Having identified all potential nexuses within the proposed critical habitat, the analysis then focuses on identifying potential consultations and modifications to land use activities. Specific examples of activities involving a Federal nexus and likely to require a consultation are discussed along with those activities that have not historically resulted in consultations with the Service.

3.3 POTENTIAL COSTS AND BENEFITS DUE TO CRITICAL HABITAT

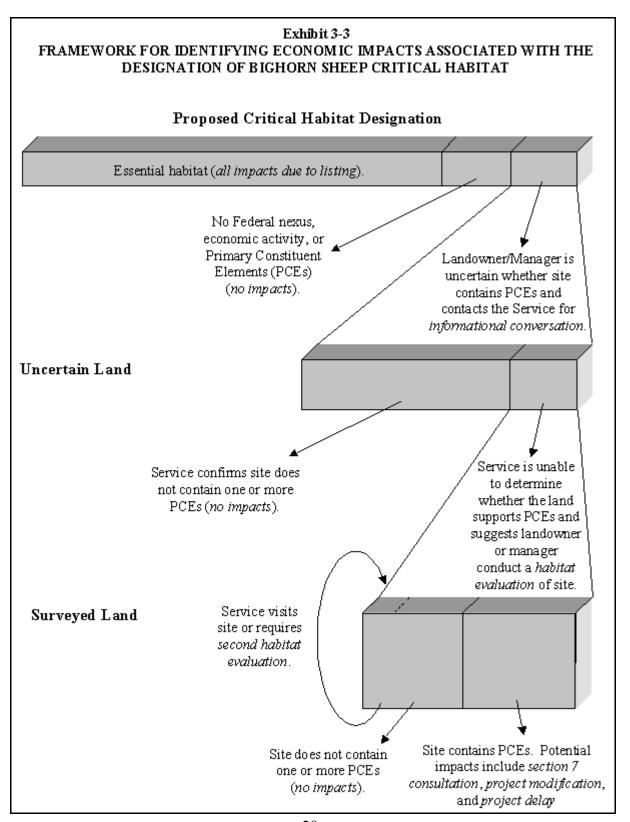
- 79. This section identifies specific costs and benefits associated with the proposed designation of critical habitat for the bighorn sheep. The discussion of potential costs identifies specific land uses and activities within proposed critical habitat designation that create a Federal nexus. The analysis then examines all formal and informal section 7 consultations that have occurred since the Service listed the bighorn sheep in March 1998 and identifies any project modifications the Service required as a result of the consultation. Using the consultation history and guidance from the Service and land owners and managers, the analysis predicts possible future activities that could trigger a section 7 consultation, as well as any future project modifications. These predictions are used to determine which section 7 consultations or modifications (if any) could result in economic impacts attributable to the proposed critical habitat designation. This analysis assumes compliance among landowners and Federal agencies with respect to responsibilities required by section 7 of the Act.
- 80. In some cases, the designation of critical habitat for a species can cause the Service to reinitiate a consultation that has already been "completed" in order to address critical habitat. The Service states that reinitiations would be unlikely to occur within the bighorn sheep critical habitat. This is because new information has not become available that indicates past agreements would be affected by a critical habitat designation or that biological situations have changed
- 81. The analysis estimates economic benefits using a similar methods. Bighorn sheep viewing, existence and non-use benefits attributable to the listing are determined and used as a guide to predict future benefits. Current and future benefits are attributed to the proposed critical habitat designation when appropriate.

3.3.1 Economic Costs

82. Exhibit 3-3 identifies the framework used to determine the economic costs attributable to the designation of critical habitat. The top bar represents the entire acreage of proposed critical habitat. A large majority of the critical habitat was designated "essential habitat" in the Recovery Plan. As mentioned in the Baseline Regulations section, land designated as essential habitat is essential to the recovery of the bighorn sheep, and all Federal agencies must consult with the Service regarding actions they fund, authorize, or carry out that may affect the bighorn sheep. Therefore, all section 7 consultations and associated project modifications are attributable to the listing of the species and the information about bighorn sheep habitat provided in the Recovery

¹⁶Quantitative estimates of economic costs were only estimated when the designation of critical habitat would result in an economic effect beyond the economic effect arising from the listing.

Plan, i.e. the baseline scenario. No incremental economic costs associated with critical habitat designation are anticipated on essential habitat land.



83. The essential habitat line cannot be specifically described in legal or technical terms because it follows geographical and topographical features. In order to make a legal definition of critical habitat, the Service used a quarter-section grid based on the Public Land Survey township, section, range coordinate system to include all of the land designated essential habitat in the Recovery Plan. In order to include all of the essential habitat using this method, some land that is outside of essential habitat is included within the critical habitat designation. Portions of this land have no Federal nexus, economic activity, or primary constituent elements and thus will have no impacts under the proposed critical habitat designation.

"Uncertain Land"

84. Critical habitat outside of essential habitat with a Federal nexus is called "uncertain land" in this analysis. This land is called "uncertain" is because it is unclear whether this land contains one or more primary constituent elements essential for the recovery of the bighorn sheep. Landowners or managers of uncertain land are likely to contact the Service in order to determine if their land contains primary constituent elements. The economic cost of the informal information conversation is a real economic cost incremental to the designation of critical habitat. The breakdown of the economic cost is presented in Exhibit 3-4. The cost analysis suggests a range between \$75 and \$260 per conversation.¹⁷

¹⁷Informational conversations also have educational benefits to the landowner or manager and to the Service. This incremental benefit will be discussed in below in the benefits section.

Exhibit 3-4 ECONOMIC COST OF INFORMATIONAL CONVERSATION							
Estimate Length of opportunity opportunity conversation (hours) Assumed opportunity opportunity expenses Other expenses cost, cost, the cost per cost of time, private party Other expenses ocot, private private party the Service biologist Other expenses ocot, private party opportunity cost of time, private party sation							
Low Estimate (landowner or manager performs conversation)*	1.0	\$23	\$50	\$5	\$28	\$50	\$78
High Estimate (legal professional/ other hired professional performs conversation)	1.0	\$200	\$50	\$10	\$210	\$50	\$260

Source: 1998 Occupational Employment Statistics Survey, http://www.calmis.ca.gov, September 12, 2000 and Federal Government General Schedule (GS) Rates, 1999, http://www.govexec.com/careers/99pay/gs99.htm, September 13, 2000.

Note: Average wage rates include adjustments for benefits.

85. The informational conversation could result in two possible outcomes. The Service could state that the uncertain land does not contain one or more primary constituent elements as discussed in the Proposed Rule. For a majority of landowners or managers of uncertain land, the Service will be able to confirm the lack of one or more primary constituent elements on the uncertain land during the informational conversation. For these sites, the designation of critical habitat will likely have no impact beyond the informational conversation.

"Surveyed Land"

86. For portions of the uncertain land, the Service may not be able to determine if one or more primary constituent elements exist on the land during the informational conversation and may require a habitat evaluation. These evaluations can be conducted by ecological consultants and represent an incremental economic cost of critical habitat designation to landowners and managers. Conversations with ecological consultants in the region of the proposed critical habitat who are recognized by the Service as qualified to perform bighorn sheep habitat evaluations revealed

^{*} Note: The landowner or manager hourly wage was derived from an average of the mean hourly wages for the Riverside-San Bernardino PMSA and the San Diego PMSA.

survey costs ranging from \$750 to \$1,000 per day per surveyor.¹⁸ Site visits for small to mid sized land parcels (10 to 100 acres) generally include one to two person-days of surveys and one person-day to write up the findings in a report. The total cost of a such an evaluation ranges from \$1,500 to \$3,000. Larger land parcels may require five to ten person-days for field surveys and two person-days for report preparation. These evaluations are estimated to cost in the range of \$5,000 to \$12,000.

- 87. After a habitat evaluation is completed, the evaluated land could fall into three possible categories. Occasionally, the Service may disagree with the methodology and techniques used in preforming the habitat evaluation. In this case, the Service may require another habitat evaluation, or conduct the evaluation using its own biologists. This second evaluation is likely to cost the same as the first, or somewhere between \$1,500 and \$12,000 depending on the size of the site.
- 88. Alternatively, the habitat evaluation(s) may find that the land lacks conservation value because it does not contain one or more of the primary constituent elements. In this case, the Service would review the evaluation report(s) and likely agree with a determination of no effect or no adverse modification of critical habitat. Therefore, these sites would have no incremental impacts of critical habitat designation beyond the cost of the informational conversation and the habitat evaluation.
- 89. On the other hand, the habitat evaluation(s) may determine that the land has conservation value because it contains one or more primary constituent elements essential for the recovery of the bighorn sheep. In this case, the landowner or manager should consult with the Service to determine the extent to which an action will cause jeopardy to the species or adversely modify critical habitat. Because these sites are outside the essential habitat identified in the Recovery Plan, it is unlikely that the landowner or manager would have consulted with the Service under the listing of the species. Therefore, the economic impacts of these consultations and associated project modifications and/or delays are considered to be incremental to the designation of critical habitat.
- 90. The economic costs of performing a section 7 consultation can vary widely depending on the type and scope of a project and the level of detail required in the consultation. Some consultations can be completed informally with one meeting and no project modifications. Other consultations can last 18 months and require the preparation of a Biological Opinion. Economic costs are incurred by the Service, the Federal Action agency, and (on non-Federal lands) the applicant. Preliminary estimates of the total cost of consultation reveal a range of \$1,100 to

¹⁸Personal communications with Dames and Moore, Inc., Dudek & Associates, Inc., Environ Associates, and Jones & Stokes on September 7-8, 2000.

\$7,400 per consultation for the Service and Action agency, and \$400 to \$1,400 per consultation for the applicant.¹⁹

91. The section 7 consultation process sometimes requires a landowner or manager to modify the proposed project in order to minimize impacts on the bighorn sheep. The economic costs of project modifications vary widely. In order to reflect that range, this analysis provides estimates of the economic costs of three types of bighorn sheep project modifications. Based on these examples, the economic cost of a project modification could range from \$5,000 to \$80,000.

Habitat markers: The costs associated with the installation of habitat markers likely would involve a landowner or manager hiring a biological consultant to survey the land and place habitat markers in sensitive areas. Based on estimates of the costs of biological surveys given above, the total cost is likely to be \$5,000.

Recreational restrictions: A section 7 consultation may require a land manager to place restrictions on recreational activities. These restrictions could include, for example, voluntary seasonal access restrictions and the prohibition of dogs in bighorn sheep habitat. To enforce these restrictions, the land manager may print and install signs and hire a part-time ranger to monitor trail use. The total cost of these activities could reach approximately \$10,000 to \$15,000.²⁰

Private party conservation measures: A section 7 consultation may require private parties to perform on-site and off-site conservation measures to bighorn sheep habitat. Examples of conservation measures include planting seed, filling in holes, and blocking off access trails. The total cost of these activities, along with associated biological consultant fees and maintenance over a 10 year time span, could reach \$80,000.²¹

92. In addition to project modifications, the section 7 consultation process may delay some projects. Often, the section 7 consultation process only takes a few months and does not delay a

¹⁹Preliminary estimate based on statistical analysis of historical consultation information provided by the Service. By law, formal consultations can last longer that 18 months.

²⁰Personal communication with Outdoor Recreations Planner, BLM Palm Springs Office on August 23, 2000.

²¹Personal communication with Regional Permitting/Compliance Specialist, Granite Construction Company on October 10, 2000.

project longer than other planning and permitting processes. In other cases, the section 7 consultation process can take several months and cause delays in projects that cause applicants to incur real economic costs (for a more detailed discussion of project delays, please see the "Potential Impacts Associated with Project Delays and Property Values" section). Based on the past bighorn sheep consultations, the estimated incremental economic cost of a project delay due to the section 7 consultation process ranges between \$0 and \$100,000.²²

California Environmental Quality Act (CEQA)

- As discussed the "Relevant Baseline Information" section (section 2.3), the designation of critical habitat for the bighorn sheep is not likely to cause any incremental costs associated with CEQA for lands that are known to be bighorn sheep habitat (i.e., lands identified as essential habitat in the Recovery Plan). Yet, as Exhibit 3-3 demonstrates, the current designation of critical habitat includes some land outside of the land designated essential habitat ("uncertain land"). Thus, the designation of critical habitat may increase the knowledge about the range of the bighorn sheep for project developers and Federal agencies. As a result, the designation of critical habitat may result in some incremental activities and economic costs associated with CEQA.
- 94. Section 15065 of Article 5 of the CEQA regulations state that a lead agency must prepare an Environmental Impact Report (EIR) for projects that "reduce the number or restrict the range of an endangered, rare or threatened species." This analysis assumes that a lead agency will rely on the Service's determination of the range of the bighorn sheep. Thus, a lead agency will not prepare an EIR for sites on uncertain land where the Service confirms the lack of one or more bighorn sheep primary constituent elements. This assumption is made because land that does not contain primary constituent elements is not likely to be considered part of a species range by a lead agency. Even if the lead agency does not prepare an EIR, it may have to contact the Service in order to determine weather a parcel of land contains primary constituent elements. This conversation is likely to result in a economic cost similar to the economic costs of informational conversations described above. Thus, the incremental cost associated with CEQA of the designation of critical habitat for each site on "uncertain land" is between \$50 and \$250.
- 95. As identified in Exhibit 3-3, certain sites on "uncertain land" may have bighorn sheep primary constituent elements. The identification of these sites increase the known extent of the bighorn sheep range beyond the lands included in essential habitat. This analysis makes the conservative assumption that a lead agency will prepare an EIR for all of these sites, and that the economic costs associated with the preparation of the EIR are fully attributable to critical habitat. To develop an estimate of these costs, this analysis considered the results of a mail survey that asked California respondents to estimate the total preparation cost of all EIRs completed in 1990.

²²Ibid.

For the 188 respondents who answered the question, the average 1990 cost of an EIR was \$38,124.²³ Adjusting for inflation, this analysis assumes that the incremental economic cost for each project that requires an EIR is approximately \$50,000.²⁴

96. The remainder of this analysis identifies the Federal, Tribal, State, local and private landowners and managers and the Federal nexuses that exist on their land. The landowner or manager's consultation history is used as a guide to predict future consultation frequency. Finally, Exhibit 3-3 is used to determine the total economic impact attributable to the designation of critical habitat.

3.3.2 Federal Landowners and Managers

97. Twenty-nine percent, or approximately 250,000 acres, of the proposed critical habitat designation is managed by the Federal government. The major agencies managing this land are the Bureau of Land Management (BLM), the U.S. Forest Service (USFS), and the Department of Transportation (DOT).

Bureau of Land Management- Riverside County

- 98. A majority of the BLM land in Riverside County is contained within the 64,340-acre Santa Rosa Wilderness. Since this land is designated wilderness under the 1964 Wilderness Act, economic activity on the land primarily is limited to primitive recreation and ecological research.²⁵ Residents of the Coachella Valley and visitors to the region use the network of trails for hiking and sightseeing. The Bighorn Institute conducts research on the bighorn sheep within BLM lands.
- 99. BLM in Riverside County has conducted one formal section 7 consultation and several informal consultations with the Service. The formal section 7 consultation began in March 1998

²³John D. Landis et al. *Fixing CEQA: Options and Opportunities for Reforming the California Environmental Quality Act (Brief)*, California Policy Research Center, University of California, November 1995. *http://www.ucop.edu/cprc/ceqa.html*. October 9, 2000.

²⁴This analysis recognizes that the CEQA regulations can cause project developers to incur legal fees and the economic costs associated with project modifications and mitigation measures suggested by the lead agency. These costs are a result of the CEQA regulations and are part of the baseline and thus are not considered attributable to the designation of critical habitat in this analysis.

²⁵Bureau of Land Management, "Santa Rosa Wilderness", http://www.ca.blm.gov/caso/santar.htm, August 18, 2000.

and was completed in July 1999. The consultation involved a private eco-tourism provider who used BLM land in their tours. The consultation included research on baseline levels of human disturbance, several meetings and negotiations between BLM and the Service, and the Service's preparation of a Biological Opinion. BLM and the Service estimate that this consultation was significantly longer than average.

- 100. The Biological Opinion issued in the formal consultation required a reduction in the maximum number of tours from 600 per month to 300 per month. The Biological Opinion also restricts BLM land access to two caravans of vehicles per day and restricts the tours from stopping while traveling through a seven mile corridor of prime sheep habitat.²⁶ These project modifications are designed to minimize impacts and disturbances on the bighorn sheep while allowing tourism to continue to operate in a profitable manner.
- 101. BLM has completed or is currently involved in several informal section 7 consultations. In 1997, BLM and the Coachella Valley Water District consulted with the Service on the placement of a water storage tank in La Quinta, but this consultation was completed as a conference prior to the listing of the bighorn sheep. In 1999, BLM and the Agua Caliente Tribe consulted with the Service regarding access to the Dunn Road. This consultation took about three months and consisted of a meeting and the writing of a letter. BLM also conducts ongoing informal consultations regarding recreational trail use.
- 102. BLM estimates that future consultation frequency and duration will follow the established historical pattern. Future consultations will likely be conducted in reference to a new recreation management plan developed in accordance with the Recovery Plan, the management of the proposed Santa Rosa and San Jacinto Mountains National Monument, recreational trial modifications, and the issuance of land use permits similar to the process that prompted the formal eco-tourism consultation.²⁷ Many of these future consultations will likely be completed informally, but some may require formal section 7 consultations.
- 103. BLM and the Service both indicate that the future consultations would have been conducted under the listing and the Recovery Plan, regardless of whether critical habitat was designated. Therefore, BLM and the Service both believe the proposed critical habitat designation in Riverside County will create no economic impact beyond the economic impacts of the listing of the Peninsular Bighorn Sheep. Several residents of Riverside County apparently disagree with this indication. They have expressed concern that the designation of certain areas such as the Coral

²⁶Personal communication with Outdoor Recreations Planner, BLM Palm Springs Office on August 23, 2000.

²⁷Personal communication with Field Manager, BLM Palm Springs Office on August 23, 2000.

Reef Mountains in La Quinta as critical habitat will result in restrictions on recreation that will have economic impacts on the residents and business that rely on the tourism in those areas.²⁸

104. While restrictions on recreation can create adverse economic effects, these effects cannot be attributed to the designation of critical habitat. The Coral Reef Mountains were designated essential habitat in the Recovery Plan. This means that the Coral Reef Mountains were known to be bighorn sheep habitat prior to the designation of critical habitat. Federal agencies must consult with the Service regarding any action that has a Federal nexus and may affect the bighorn sheep. Thus, the listing of the bighorn sheep would require section 7 consultations and recreational restrictions in the Coral Reef Mountains, and therefore these economic effects cannot be attributed to the designation of critical habitat (i.e., they would have occurred in the absence of the critical habitat designation). Similarly, restrictions on recreation in other regions of the proposed critical habitat are not likely to be a result of the designation of critical habitat. Current restrictions, such as the banning of dogs from bighorn sheep habitat and voluntary seasonal trail closure, were recommended by a trail advisory group in December 1999 as a result of the listing of the bighorn sheep. The designation of critical habitat does not require land managers to put any additional restrictions on activities above and beyond those required under the listing. Therefore, the incremental economic impact of the designation of critical habitat on BLM land in Riverside County is likely to be small.

Bureau of Land Management- San Diego and Imperial Counties

105. A majority of the land managed by BLM in San Diego and Imperial Counties that lies within the critical habitat designation is classified as wilderness areas. These wilderness areas include Carrizo Gorge, Sawtooth Mountains, Coyote Mountains, Fish Creek Mountains, and Jacumba Wilderness. Activity on these lands is restricted to primitive recreation, except for a few areas where cattle grazing allotments existed prior to the wilderness designation. Cattle grazing occurs outside the wilderness areas as well, in addition to mining and open area off-road vehicle use.

BLM has conducted one formal section 7 consultation with the Service regarding the Jimenez Sand and Gravel Pit owned by the Granite Construction Company near the Fish Creek Mountains. The Service involvement in the consultation lasted approximately six months, but the entire permitting process with BLM took approximately three years. The consultation was conducted in reference to the Desert tortoise as well as the bighorn sheep. The Biological Opinion issued in this consultation required the Granite Construction Company to restore the abandoned

²⁸Letter from Vice President of Planning and Entitlements, KSL Development Corporation to Field Supervisor, Carlsbad Fish and Wildlife Office on August 4, 2000.

Jimenez gravel pit to its natural condition by filling in areas and planting seed and to block off several trails leading into the adjacent wilderness area.

3 Communications, and BLM are consulting the Service about laying fiber optic cables across bighorn sheep habitat in an ongoing informal consultation. The Service is also currently in informal consultations with BLM and the ranchers that utilize the McCain Valley grazing allotment regarding potential allotment modifications. BLM has not conducted a section 7 consultation on the off-road vehicle use open area because only a small portion overlaps with bighorn sheep habitat and motorists generally refrain from entering the mountains. The informal consultations to date have resulted in project modifications consisting of constraints on certain activities, such as test drilling for fiber optic cable, to minimize bighorn sheep disturbance.

BLM predicts consultations in the future will be similar to the ones conducted in the past. BLM predicts that it will conduct a formal section 7 consultation regarding the use of the McCain Valley grazing allotment, as well as one regarding the Cane Break grazing allotment, in the near future. Installation of gap fencing, cattle monitoring and reducing the amount of acreage open to cattle grazing are potential project modification. The Service and BLM agree that these section 7 consultations and potential project modifications are attributable to the listing and are not a result of the proposed critical habitat designation.²⁹

United States Forest Service

109. Approximately one percent of the entire proposed critical habitat designation lies on USFS lands. These lands are on the fringes of the San Bernardino National Forest. Over half of the USFS land within critical habitat is designated wilderness in the San Jacinto and Santa Rosa Wilderness areas. Land uses within the wilderness areas are limited to primitive recreation. Critical habitat lands outside the wilderness areas are used for cattle grazing (the Wellman allotment), hiking, biking and equestrian trails, and research activities.

110. As part of a settlement order in a lawsuit brought by the Sierra Club, the USFS issued a programmatic Biological Assessment on January 27, 1999. This Biological Assessment defined specific actions for the USFS to complete, including the removal of cattle from portions of allotments that overlap with bighorn sheep habitat, the modification of fences within and adjacent to bighorn sheep habitat, and a review of guidelines for management of hiking, biking, and equestrian trails. The Service was not involved in these discussions or in the preparation of the Biological Assessment. A subsequent consultation was conducted regarding recreational use on

²⁹Personal communication with Ecologist/Botanist, BLM El Centro Office on August 25, 2000.

USFS land. Assuming the USFS implements the actions described in the Biological Assessment and terms and conditions in the Biological Opinion, FWS and USFS do not anticipate effects or costs beyond those attributable to the listing in the future.

111. If the Santa Rosa and San Jacinto Mountains National Monument Act of 2000 (H.R. 3676) is enacted, BLM and USFS will likely work cooperatively in the management of the newly established National Monument. The Act requires the two agencies to develop a management plan within three years after the date of the enactment of the Act. The USFS and BLM will likely consult with the Service during the preparation of this management plan. The Service indicates that this consultation would have happened regardless of weather critical habitat was designated and thus is attributable to the listing of the bighorn sheep.

Department of Transportation

- The Department of Transportation (DOT) maintains a section of Interstate 8 that traverses the proposed critical habitat designation in Imperial County and a small portion of San Diego County. Any activity that could affect the bighorn sheep, such as road repair, road construction, and installation of fencing, would constitute a Federal nexus and may require a section 7 consultation.
- 113. The Service has not undergone formal or informal consultations with DOT in the past. The Service estimates that future consultations may occur, especially if the Service pursues concepts to create passes over or under the road to allow bighorn sheep to pass from the Anza-Borrego State Park region into the Jacumba Wilderness and ultimately into Mexico. The concepts to create highway passes for the bighorn sheep are outlined in the Recovery Plan. Thus, these potential future consultations would have occurred under the listing of the bighorn sheep and the implementation of the Recovery Plan, and are not attributable to the designation of critical habitat.

3.3.3 Trust Lands

114. _____The proposed critical habitat designation includes parts of three Indian reservations. The Morongo Indian reservation includes approximately 640 acres of critical habitat in the northwestern portion of the proposed designation. The Agua Caliente Tribe manages approximately 15,650 acres in and around Palm Springs and the Torres Martinez Tribe manages 4,170 acres in Imperial County near the Salton Sea.

Morongo Tribe

115. The critical habitat proposal on the Morongo reservation is predominantly very steep terrain, with the potential for up to 100 acres of flatter topography that could be developed. The Service has coordinated with the Tribe but potential future land uses have not been discussed in detail. The Service estimates that consultations with the Morongo Tribe are unlikely in the near future.³⁰

Agua Caliente

- 116. Approximately half of the 32,000-acre Agua Caliente Indian Reservation is prime bighorn sheep habitat. Land uses within the reservation include private residential and commercial development in the fringe areas of the proposed critical habitat designation around Palm Springs and Cathedral City. Private development issues will be addressed in the Private Landowner section below. Other uses include hiking, horseback riding, and mountain biking. The Agua Caliente Tribe also maintains the Indian Canyons park. This popular park has an admission fee and provides a trading post, guided tour of the canyons, and picnic areas. The undeveloped nature of the park attracts tourists and thus provides an incentive for the Tribe to preserve the area's natural quality.
- 117. The Agua Caliente Tribe is currently developing the Indian Canyons Master Plan to guide future development and use of the park. In accordance with Presidential Memorandum described above, the Service has provided technical and informational support for the development of the Master Plan in informal regular meetings. The Service is also conducting several informal discussions with the Agua Caliente Tribe as they develop a Habitat Management Plan. The Agua Caliente Tribe and the Service have similar goals to refrain from disturbing the bighorn sheep and to preserve the bighorn sheep habitat.³¹
- 118. Because the Service has been working with the Agua Caliente to develop the Indian Canyons Master Plan and the Habitat Management Plan, the Service anticipates the final plan will be sufficient to preserve the designated critical habitat and will not require a formal section 7 consultation with the Bureau of Indian Affairs. The Service also predicts it will continue to hold informal discussions with the Agua Caliente regarding any issues not covered by the Habitat Management Plan. Most importantly from the perspective of economic impacts, the Service

³⁰A representative of the Morongo Tribe was not available for comment at the time of this analysis.

³¹Personal communication with Director of Planning for the Agua Caliente Indian Tribe on August 28, 2000.

believes that all future consultations and any associated project modifications would have occurred due to the listing of the bighorn sheep and are not attributable to the proposed critical habitat designation. This is a reasonable prediction based on the fact that the Agua Caliente Reservation land that the Service is proposing to designate as critical habitat is prime bighorn sheep habitat and was included in the essential habitat boundaries in the Recovery Plan.

Torres Martinez Tribe

119. The Torres Martinez Indian Reservation lands within the proposed critical habitat designation are mountainous and contain no major roads.³² The Service has conducted informal discussions with the Tribe in the past, and is currently in communication with the Tribe regarding a habitat analysis. The Service would like to be involved in future conversations regarding a Habitat Management Plan, but recognizes this may not be a high priority for the Tribe. Because any future conversations would have occurred with the listing of the bighorn sheep, they are not attributable to the critical habitat designation.

3.3.4 State and Local Lands

120. Over half, or approximately 450,000 acres, of the proposed critical habitat designation is managed by State and local governments. The major agencies responsible for this land are the California Departments of Parks and Recreation, Fish and Game, and Transportation, Coachella Valley Water District and the Riverside County Regional Parks and Open Space District.

California Department of Parks and Recreation

- 121. All of the land managed by the Parks and Recreation Department within critical habitat is contained within the Anza-Borrega Desert State Park. The park contains 500 miles of dirt roads, two County roads, one State highway, two dozen hiking trails, 12 wilderness areas, nine primitive camping sites, two developed camping sites, and a visitor's center. Activities within the park consist of hiking, camping, wildlife viewing and research.
- 122. The Anza-Borrega has not conducted any formal or informal consultations regarding the bighorn sheep because its habitat management goals mirror those of the Service and it has very few Federal nexuses. The park has asked for the Service support for several actions pertaining to

³²The Torres Martinez Tribe disputes the finding that any of their land is bighorn sheep habitat. The Service is aware of the Tribe's views but continues to rely on other evidence introduced in the Recovery Plan that states the land in question is suitable for and used by the bighorn sheep.

bighorn sheep, such as the removal of feral horses from bighorn habitat and a road closure for motorized vehicles in Coyote Canyon. The Service wrote letters of support for these actions.

The Anza-Borrega predicts that very few, if any, of its planned actions will result in a section 7 consultation. The park is considering using some DOT grants to acquire lands along State highway 78. These actions may prompt a Federal nexus. However, because the acquisitions will be made to enhance bighorn sheep habitat, the park assumes a section 7 consultation will not be necessary.³³

California Department of Fish and Game

- 124. The California Department of Fish and Game manages over 25,000 acres of land within the proposed critical habitat designation. The majority of these lands are designated as wildlife areas, ecological reserves, and State wildlife refuges. Limited primitive recreation and research are the primary land uses for California Fish and Game lands.
- Because the Department of Fish and Game shares similar conservation goals with the Service and rarely have performed an action with a Federal nexus, they have not performed any section 7 consultations with the Service in the past.³⁴ While Federal funding of academic pursuits and research may constitute a Federal nexus for future consultations, these activities are normally addressed under sections 6 and 10(a)(1)(A) of the Act.

California Department of Transportation

- 126. State Highways 74, 78, and 111 cross parts of the proposed critical habitat designation. The Proposed Rule indicates that road and railway rights-of-way that bighorn sheep must traverse in order to maintain connectivity between sub-populations are considered critical habitat. The major activities that occur on these roads are motorized transportation and road maintenance.
- The Service has conducted an informal consultation with the California Department of Transportation (Caltrans) regarding road maintenance work on Route 74 south of Palm Desert. This consultation consisted of a brief meeting during which the Service requested that work be done outside of certain windows of time to reduce the bighorn sheep disturbance.

³³Personal communication with Anza-Borrega Desert State Park Resource Ecologist on August 25, 2000.

³⁴Personal communication with Senior Biologist for the Lands and Facilities Division, California Department of Fish and Game on August 25, 2000.

The Service predicts that any future consultations with Caltrans will be similar to the Route 74 informal consultation. Caltrans activities do have a Federal Nexus because it receives DOT funding for road maintenance and construction. Because the State highways traverse land that is "essential habitat" as described in Exhibit 3-3, future section 7 consultations would have been required under the listing of the bighorn sheep and are not attributable to the proposed critical habitat designation.

Coachella Valley Water District

- 129. The Coachella Valley Water District's (CVWD or the District) mission is to protect groundwater resources and provide supplemental sources of water to residents of Riverside, Imperial and Sand Diego Counties. The CVWD's present activities include the delivery of irrigation water, delivery, production and storage of domestic water, collection of wastewater, constructing and maintaining storm-water flood protection works and operating and maintaining irrigation drainage works.
- 130. The CVWD activities prompt several Federal nexuses because many of the District's facilities are located on Federal land. This nexus resulted in an informal section 7 conference with the Service in 1997 regarding a water storage tank in La Quinta on BLM land.³⁵ This conference did not result in any significant project modifications. Many of CVWD's activities also affect waters of the United States and are thus subject to regulation by the Army Corps of Engineers.
- 131. The CVWD predicts that future consultations and associated project modifications could require alterations in the location and design of current and proposed facilities, seasonal restrictions on access to sites, seasonal restrictions on construction activities, and restrictions on groundwater percolation sites on alluvial fans. The CVWD estimates these potential project modifications would result in large economic costs for the District and its customers.³⁶
- The CVWD states that critical habitat will subject the CVWD to an "unwarranted new tier of imposed Federal regulation," and that critical habitat "is anticipated to interfere with the District's ability to operate and maintain its facilities," but does not define how critical habitat will impose incremental Federal regulations beyond the regulations associated with the listing of the bighorn sheep. Conversations with the CVWD Biologist reveal that the estimates of large

³⁵Since this conference was held prior to the listing of the bighorn sheep, it is called a conference and not a consultation. The conference process is very similar to the consultation process.

³⁶Letter from General Manager-Chief Engineer, Coachella Valley Water District to Field Supervisor, Carlsbad Fish and Wildlife Office on August 31, 2000.

economic costs associated with the proposed critical habitat designation were made under the assumption that critical habitat would impose restrictions above and beyond those associated with the listing of the bighorn sheep. This analysis implies that on lands included in essential habitat as identified in Exhibit 3-3, the designation of critical habitat will not impose any incremental impacts on current or proposed projects.

133. It is likely that the CVWD owns and operate facilities on "uncertain" land as identified in Exhibit 3-3. CVWD has the potential to incur the economic costs of conducting informational conversations, biological surveys, consultations and project modifications for facilities on these uncertain lands. Such costs would be incremental to the designation of critical habitat for the bighorn sheep.

Riverside County Regional Parks and Open Space District

- Riverside County Regional Parks manages Lake Cahuilla Recreational Area located within the proposed critical habitat designation. This park covers 710 acres four miles southeast of La Quinta. Lake Cahuilla is used for hiking, fishing, camping, and equestrian camping, and contains 50 developed camping sites, a swimming pool, and recreational vehicle hookups.³⁷
- the Service has not conducted any section 7 consultations with Lake Cahuilla in the past, but identified the use of Bureau of Reclamation land or water as a potential Federal nexus. If any section 7 consultations occur in the future, the Service believes they would have been required under the listing of the bighorn sheep and would not be attributable to critical habitat designation.

3.3.5 Private Lands

136. Seventeen percent, or approximately 150,000 acres, of the proposed critical habitat designation is owned or managed by private landowners. While private lands make up a small percentage of the critical habitat designation in San Diego and Imperial Counties, over one third of the critical habitat designation in Riverside County is owned by private entities.

³⁷Riverside County Regional Parks, "Desert Parks," http://www.co.riverside.ca.us/activity/parks/desert.htm, August 30, 2000.

Private Lands in San Diego and Imperial Counties

- 137. Private lands in San Diego and Imperial Counties included within the proposed critical habitat designation have little development potential because of remote location and lack of water. The major land uses that could create a Federal nexus are grazing, railroad operation, and isolated development.
- 138. The Service has not conducted any formal section 7 consultations regarding private lands in San Diego and Imperial Counties. The Service currently is involved in informal discussions with the owners of a 260-acre private parcel of land within the BLM Cane Break cattle allotment. Domestic cattle are a potential threat to bighorn sheep through the transmission of disease. Since bighorn sheep have been seen using a water source on the property, the private landowner may apply for a section 10 incidental take permit. Alternatively, the private landowner may choose to include his land in the planned BLM cattle allotment section 7 consultation discussed above. The Service would consider the BLM land and private land in one consultation and may suggest project modifications for BLM and the private landowner jointly. The Service indicates that this consultation would have occurred under the listing of the bighorn sheep and is not attributable to the critical habitat designation.
- The Service may consult with a private landowner who is considering re-opening the San Diego Imperial Valley Railroad line in the southern most portion of the Anza-Borrego State Park. This project may create a Federal nexus if the private landowners consult with the Federal Railroad Administration within the Department of Transportation. This future consultation would occur on essential habitat land. As identified in Exhibit 3-3, this impact is attributable to the listing of the species and not to the designation of critical habitat.
- A land parcel described at a public hearing held in response to the Proposed Rule may be an example of "uncertain" land as identified in Exhibit 3-3. This parcel is located on the fringe of the proposed critical habitat designation. The property owner indicates that he has plans to develop the land, and thus may need a Federal permit. This land could be subject to the economic costs of informational conversations, biological surveys, consultations and project modifications; or the Service could determine there is no adverse effect or destruction/adverse modification of critical habitat if it finds the land does not contain one or more primary constituent elements. An estimate of the total number of "uncertain" sites similar to the one described in this example, as well as the economic costs associated with the potential informational conversations, biological surveys, consultations and project modifications on these sites are estimated in the "total economic costs" section below.

³⁸Public comment at the *Public Hearing Regarding a Proposal to Designate Critical Habitat* for the Endangered Peninsular Bighorn Sheep, July 20, 2000.

Private Lands in Riverside County

- 141. The Coachella Valley is experiencing rapid development growth, particularly in Riverside County. Principal towns in this area include Palm Springs, Palm Desert, Rancho Mirage, and Indian Wells. These towns cater to golfing enthusiasts, and many golf courses and resorts are located in the area. Specifically, the Coachella Valley has over 100 golf courses, with more planned.³⁹ Several major shopping centers are also being planned to further enhance the area's reputation as a tourist destination.
- 142. Accordingly, this area's economy depends heavily on service and retail jobs to cater to the demands of visitors and retirees who are visiting and relocating to the Coachella Valley. As a result, the housing stock has rapidly grown over the past decade at a rate that has exceeded the State average. Some of the housing has been built to accommodate the new employment, while the rest of the housing has been built to cater to the demand for vacation and retirement homes. According to the 1990 Census, the construction industry accounted for about ten percent of the labor force, or about 10,000 employees.
- Many construction activities within the Coachella Valley require a Federal permit of some kind to proceed with development. Typical Federal permits include a Section 404 permit issued by the U.S. Army Corps of Engineers, which is required when development activities affect wetlands and waterways, and an U.S. Environmental Protection Agency National Pollution Discharge Elimination System (NPDES) permit, which is required to ensure that storm water runoff from construction sites is minimized, the Service indicates that the EPA rarely consults with the Service in this area and that the majority of the past consultations have been with the Army Corps.
- The Service has conducted two formal consultations and several informal consultations with private developers since the listing of the bighorn sheep. The Service conducted the first consultation with the Army Corps in regards the to Ritz-Carlton's Rancho Mirage golf course plan. The consultation lasted approximately one year. The Service prepared a Biological Opinion and proposed a reasonable prudent alternative (RPA) that altered the footprint of the original golf course plan. After some negotiation, the Ritz-Carlton developer agreed to the RPA footprint.
- 145. The second formal consultation was also with the Army Corps and addressed the Mirada housing project. This consultation lasted about 6 months and resulted in the Service issuing a Biological Opinion with a non-jeopardy finding. The Service agreed to a combination of on-site and off-site conservation measures, including installation of fencing and the provision of funding for bighorn sheep research and monitoring. In addition to the two formal section 7 consultations,

³⁹Town of Palm Desert, "Coachella Community Profile," http://palm-desert.org/bo/html/community.html, September 7, 2000.

the Service has also conducted several informal consultations since the listing that involved discussions and/or meetings.

The Service predicts that similar consultations and project modifications will occur in the future in connection with the bighorn sheep. The Service has identified several residential/golf course projects that are in the planning stages (Mountain Falls, Shadow Rock, and Palm Hills) that may require section 7 consultations. These consultations may require significant project modifications similar to the ones described above.

147. The Service believes that a majority of the future section 7 consultations with private developers would have occurred on essential habitat land are attributable to the listing of the bighorn sheep and are not attributable to the critical habitat designation. Some private landowners have voiced concerns that critical habitat designation will severely limit their activities on private lands and that the proposed critical habitat designation contains developed lands that are not occupied by the sheep. Any of these lands with a Federal nexus represent "uncertain" land identified in Exhibit 3-3. If Federal nexuses exist, these private landowners may incur the cost of an informational conversation and potentially the cost of a biological survey. The Service mentioned that a large portion of the uncertain land in Riverside County with a Federal nexus is within urban and residential development areas. the Service will generally be able to identify the lack of primary constituent elements on these developed lands during the informational conversation. Thus, the potential for the Service to require private landowners to conduct biological surveys is low in this region.

3.3.6 Total Economic Cost

The proceeding analysis of the section 7 consultation history of the landowners and managers affected by the proposed critical habitat reveals that since the listing in 1998, the Service has performed four formal consultations and approximately 10-20 informal consultations. Using the consultation history as a reference point and the break-down of land in Exhibit 3-3, this analysis predicts the following numbers of incremental impacts that could be caused by the designation of critical habitat over the next ten years:

The Service and landowners or managers are likely to conduct approximately 50 informational conversations.

Of these, approximately 20 may require a habitat evaluation (five may require two evaluations).

⁴⁰Public comment at the *Public Hearing Regarding a Proposal to Designate Critical Habitat* for the Endangered Peninsular Bighorn Sheep, on July 20, 2000.

Of these, approximately ten may contain one or more primary constituent elements and require a section 7 consultation.

Of these, approximately five may involve project modifications and delays.

- 149. In addition to incremental conversations, habitat evaluations, consultations, project modifications, and project delays, the designation of critical habitat may trigger incremental impacts due to the CEQA regulations. Based on the number of impacts presented above, this analysis assumes that all 50 projects that require an informational conversation will also trigger conversations between the lead agency and the Service regarding the extent of the bighorn sheep range. This analysis further assumes that, as a conservative estimate, all ten of the incremental section 7 consultations will also trigger the lead agency to prepare an EIR.
- 150. Based on the estimates of economic impacts derived above, Exhibit 3-5 provides an estimate for the total incremental economic impact of the proposed designation of critical habitat for the bighorn sheep for the next ten years. These estimates range from \$500,000 to nearly \$2 million.

Exhibit 3-5							
TOTAL ESTIMATED ECONOMIC COST INCREMENTAL TO THE PROPOSED CRITICAL HABITAT DESIGNATION							
_	Number of Impacts	Low Estimate		High Estimate			
Impact		Cost per Case	Total Cost	Cost per Case	Total Cost		
Informational conversation	50	\$75	\$3,750	\$260	\$13,000		
Habitat evaluation	20	\$1,500	\$30,000	\$12,000	\$240,000		
Second evaluation	5	\$1,500	\$7,500	\$12,000	\$60,000		
Consultation	10	\$1,000	\$10,000	\$10,000	\$100,000		
Project modification	5	\$5,000	\$25,000	\$80,000	\$400,000		
Project delay	5	\$0	\$0	\$100,000	\$500,000		
CEQA conversation	40	\$75	\$3,000	\$260	\$10,400		
CEQA EIR	10	\$50,000	\$500,000	\$50,000	\$500,000		
Totals	Totals \$579,250 \$1,823,400						

3.3.7 Benefits

- To determine the incremental benefits of the critical habitat designation, this analysis considers those categories of benefit that will be enhanced as a result of the proposed critical habitat designation. These benefits represent incremental benefits of the designation of critical habitat, above and beyond those provided by the listing.
- 152. The primary goal of listing a species as endangered is to preserve the species from extinction. However, various, more specific economic benefits result from species preservation as well, measured in terms of regional economic performance as well as enhanced national social welfare. Regional economic benefits can be expressed in terms of jobs created, regional sector revenues, and overall economic activity. For example, the presence of a species may result in a successful local eco-tourism operation. National social welfare values reflect both use and non-use (i.e., existence) values, and can reflect various categories of value. For example, use values might include the opportunity to see a sheep while on a hike, or the recreational use of a habitat preserved

as a result of the sheep. Existence values are not derived from direct use of the species, but instead reflect the satisfaction and utility people derive by the knowledge that a species exists.

- While little research has been done on the various categories of benefits associated with preservation of bighorn sheep populations, several studies have attempted to quantify the existence and use values of bighorn sheep. One relevant study used contingent valuation methods to determine the total value of a herd of 70-100 desert bighorn sheep in the Pusch Ridge Wilderness Area, 14 kilometers north of Tucson, Arizona. This study focused on existence values and nonconsumptive use values, such as recreational viewing, and excluded consumptive values such as hunting. The study asked Tucson residents how much they would pay to ensure the survival of the nearby desert bighorn sheep herd. The study determined the average response was within the range of \$14.27 and \$25.61 per household.⁴¹
- 154. If it is assumed that the mean non-consumptive current and future use and existence values are the same for the residents of Tucson, Arizona and the residents of the Coachella Valley, the total listing value of the Peninsular bighorn sheep herd can be estimated as done in Exhibit 3-6. This exhibit shows that the total value ranges from \$1.6 million to \$2.9 million. This estimate does not include residents outside of the Coachella Valley or the values residents of other regions of the country place on the existence of the bighorn sheep. Note that various factors will influence the accuracy of this benefit measure, and thus it should be viewed solely as a reasonable order-of-magnitude estimate of the benefit of preserving a single herd of bighom sheep.

Exhibit 3-6								
TOTA	TOTAL NON-CONSUMPTIVE AND EXISTENCE VALUE FOR BIGHORN SHEEP							
Scenario Tucson study total value/ of Coach ella household valley household Valley size households Total Value								
Low Estimate	\$14.27	319,000	2.85	111,930	\$1,597,241			
High Estimate	\$25.61	319,000	2.85	111,930	\$2,866,527			

Sources: California South Coast Air Quality Management District, "1997 Air Quality Management Plan," http://www.aqmd.gov/aqmp/97aqmp/chapters/m-chap8.html, September 21, 2000, and U.S. Dept of Housing and Urban Development, "Riverside County, CA Consolidated Plan," http://www.hud.gov/cpes/ca/riversca.html, September 13, 2000

⁴¹David King, Deborah Flynn and William Shaw, "Total and Existence Values of a Herd of Desert Bighorn Sheep," *Western Regional Research Publication, W-133, Benefits & Costs in Natural Resources Planning*, 1988. Adjusted to 1999 dollars using the consumer price index.

155. In addition to the benefits addressed in the study described above, the following represents additional potential benefits accruing from the protection from extinction offered by the listing of the bighorn sheep and, potentially, critical habitat:

Non-Resident wildlife viewing. People derive satisfaction and utility from seeing bighorn sheep in their natural environment. Such benefits can be expressed in terms of gains in social welfare, or improvements in regional economic performance. This magnitude of these benefits can be judged by the amount of time and money people spend to travel to see bighorn sheep (for example, an individual might choose to drive an hour or more out of their way to take in the opportunity to see a sheep). Park admission fees and fees paid to tour operators that provide bighorn tours are other examples of regional economic benefits created by such recreational opportunities.⁴²

Regional economy effects. If people's decision to come to areas like Palm Springs or Borrego Springs are influenced by the possibility of seeing a bighorn sheep, than the money they spend for lodging, food, services and retail items represent incremental benefits to the local community derived from the existence of the bighorn sheep. In addition, to the extent that habitat conservation measures result in changes in the attractiveness of a community as a place to live, critical habitat may increase the overall desirability of a region as a place to live and do business.

Ecosystem health. Bighorn sheep are part of a natural functioning desert ecosystem. Without their presence in the ecosystem, other natural organisms may suffer. Each one of these organisms may provide direct or indirect benefits to people. In addition, actions to protect the sheep may benefit other organisms.

Real estate value effects. Real estate values may be enhanced by critical habitat designation. For example, such enhancement may occur if open space is preserved and/or if allowable densities are reduced or kept at current levels as a result of critical habitat designation.

⁴²The proposed Santa Rosa and San Jacinto Mountains National Monument is likely to enhance national awareness of the unique natural resources of the area and thus increase the number of visitors per year. This has the potential to increase the number of people who see the bighorn sheep and thus will likely enlarge the non-resident wildlife viewing benefit.

Spiritual values. The bighorn sheep is a symbol of the desert wilderness. Native American Tribes and other groups of people benefit from the existence of the bighorn sheep in symbolic and spiritual ways.⁴³

Designation of critical habitat may provide all of these benefits. However, it is difficult at this time to estimate the total benefit afforded by critical habitat, since too little is known about (1) the likely benefits of each consultation and modification, and (2) the extent to which such modifications would result from critical habitat.

Critical Habitat Benefits

- The benefits identified above arise from the protection afforded to the bighorn sheep under the Federal listing. In the Proposed Rule, the Service states that critical habitat designation will provide some incremental benefits beyond the listing benefits. Critical habitat designation provides some educational benefit by increasing awareness of the extent of bighorn sheep habitat. The 50 incremental informational conversations identified in Exhibit 3-3 are one example of this educational benefit. In addition, any incremental surveys, consultations, and project modifications conducted due to the designation of critical habitat are likely to increase the probability that the bighorn sheep will recover. Critical habitat also provides a legal definition of the extent of bighorn habitat. This reduces the amount of uncertainty Federal agencies face when determining if a section 7 consultation is necessary for an activity with a Federal nexus.
- 157. Several land mangers in the region have expressed their support for the proposed critical habitat designation. The Anza-Borrega Desert State Park mentioned that critical habitat will increase the amount of support for its current habitat uses and management practices. The California Department of Fish and Game mentioned that critical habitat will increase its ability to focus on sensitive areas. Several private citizens have also written letters in support of the proposed critical habitat designation. By supporting the critical habitat designation, these organizations and individuals are expressing that they receive some level of benefit from the proposed designation.
- 158. The quantification of total economic benefits attributable to the designation of critical habitat is, at best, difficult. The number of additional section 7 consultations predicted to occur as a result of the proposed critical habitat designation is more that double the number formal consultations that have occurred to date. Yet, without knowing the exact nature of these consultations and the associated project modifications, it is difficult to predict the incremental increase in the probability that the bighorn sheep will recover. Even one project modification associated with the designation of critical habitat has the potential to save the bighorn sheep. While

⁴³Public comment at the *Public Hearing Regarding a Proposal to Designate Critical Habitat* for the Endangered Peninsular Bighorn Sheep, on July 20, 2000.

unlikely, this hypothetical project modification would have the entire economic value of the listing of the species mentioned above. The total existence and non-consumptive use values for residents and non-residents could reach ten million dollars or more. Alternatively, the additional consultations may have no impacts on the probability of recovery for the species. In this scenario, the incremental benefits of the bighorn sheep would be limited to the educational benefits, increased support for existing conservation efforts, and the reduced uncertainty regarding the extent of bighorn sheep habitat.

3.3.8 Summary of Economic Impacts

159. Exhibit 3-7 below summarizes potential economic impacts of the proposed designation. First, it indicates current or future activities of the landowners and managers within the proposed critical habitat designation that may require section 7 consultation. In addition, it identifies the Federal nexus of each activity. Finally, Exhibit 3-7 assesses the potential for new or reinitiated consultations or other impacts and benefits attributable to the designation of critical habitat.

Exhibit 3-7

SUMMARY OF POTENTIAL CONSULTATIONS AND IMPACTS WITHIN PROPOSED CRITICAL HABITAT FOR THE PENINSULAR BIGHORN SHEEF

_	PROPOSED CRITICAL HABITAT FOR THE PENINSULAR BIGHORN SHEEP								
Type of Land Owner or Manager	Land Owner or Manager	Current or Future Activities that May Require Consultation	Federal Nexus	Potential for New or Reinitiated Consultations or Other Impacts Attributable to Critical Habitat*	Potential Benefits Attri butable to Critical Habitat				
Federal	Bureau of Land Management	Recreational trail management	Federal land ownership	Low	Increased support for current bighorn sheep management activities				
		Land use permits	Federal land ownership	Low	Reduced uncertainty about extent of bighorn sheep habitat				
		Research activities	Federal land ownership	Low	Increased support for current bighorn sheep management activities				
		Management of grazing allotments	Federal land ownership	Low	Reduced uncertainty about extent of bighorn sheep habitat				
	United States Forest Service	Management of grazing allotments	Federal land ownership	Low	Reduced uncertainty about extent of bighorn sheep habitat				
		Recreational trail management	Federal land ownership	Low	Low				
		Research activities	Federal land ownership	Low	Increased support for current bighorn sheep management activities				
	Department of Transportation	Maintenance of Interstate 8	Federal land ownership/easement	Low	Reduced uncertainty about extent of bighorn sheep habitat				
Trust	Morongo Tribe	None anticipated	Bureau of Indian Affairs oversight	Low	Low				
	Agua Caliente Tribe	Recreational trail maintenance	Bureau of Indian Affairs oversight	Low	Increased support for current bighorn sheep management activities				
		Management of Indian Canyons	Bureau of Indian Affairs oversight	Low	Increased support for current bighorn sheep management activities				
		Habitat management	Bureau of Indian Affairs oversight	Low	Increased support for current bighorn sheep management activities				

Exhibit 3-7

SUMMARY OF POTENTIAL CONSULTATIONS AND IMPACTS WITHIN PROPOSED CRITICAL HABITAT FOR THE PENINSULAR BIGHORN SHEEP

Type of Land Owner or Manager	Land Owner or Manager	Current or Future Activities that May Require Consultation	Federal Nexus	Potential for New or Reinitiated Consultations or Other Impacts Attributable to Critical Habitat*	Potential Benefits Attri butable to Critical Habitat
Trust	Torres Martinez Tribe	Habitat management	Bureau of Indian Affairs oversight	Low	Increased support for current bighorn sheep management activities
State and Local	CA Department of Parks and Recreation	Acquisition of land along highways	Use of Department of Transportation grants	Low	Increased support for current bighorn sheep management activities
	CA Department of Fish and Game	Research activities	University of California system Federal funding	Low	Increased support for current bighorn sheep management activities
	CA Department of Transportation	Road maintenance	Use of Department of Transportation funding	Low	Reduced uncertainty about extent of bighorn sheep habitat
	Coachella Valley Water District	Delivery of irrigation and domestic waters	Section 404 permit	Low	Low
		Construction and maintenance of water works	Located on BLM lands	Moderate- informal and formal consultations and project modifications	Reduced uncertainty about extent of bighom sheep habitat, educational benefits of conversations, potential increase in the probability of recovery for the bighorn sheep
	Riverside County Regional Parks	Recreation activities	Use of Bureau of Reclamation water	Low	Increased support for current bighorn sheep management activities

		D CRITICAL HABIT. RY OF POTENTIAL	ibit 3-7		Cri क ्षिया Habitat 0007 - अ
		FROPOSE SUMMA	Ex	ntal for New or	tributable to
Mathiggworf Land	Land Owner or Manager	Require Consultation	Federal Nexus	Potentia Critical Reprintations Reinitiated	Potential Benefits At
Private	Private landowners	Residential and commercial development	Section 404 permit	Moderate- informal and formal consultations and project modifications	Reduced uncertainty about extent of bighorn sheep habitat, educational benefits of conversations, potential increase in the probability of recovery for the bighorn sheep
		Railroad operation	Department of Transportation licencing	Low	Reduced uncertainty about extent of bighorn sheep habitat

Sources: Information in table based on personal communications with Field Biologist, the Service Carlsbad, CA Office, August-October 2000, and other stakeholders (see footnotes and References)

^{*} Note: Any potential new or reinitiated consultation or other impact attributable to critical habitat presumes a pre-existing Federal nexus as identified in the preceding column.

3.4 ADDITIONAL IMPACTS DUE TO PROPOSED CRITICAL HABITAT

160. This section considers additional economic and socioeconomic impacts of designating critical habitat for the bighorn sheep. Specifically, this section addresses:

Potential impacts to small businesses;

Potential impacts associated with project delays; and

Potential impacts on property values attributable to public perception and/or uncertainty about proposed critical habitat.

3.4.1 Potential Impacts to Small Businesses

- 161. 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).⁴⁴ 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.
- Because proposed critical habitat for the bighorn sheep consists primarily of mountains and wilderness areas, the small businesses likely to be affected by the proposed designation are those involved in livestock grazing, mining, and construction. The designation theoretically could affect small business activities by causing delays associated with consultations and modifications to projects. One possible scenario is that the designation could reduce the amount of grazing allowed in a certain area. This could force grazing operations to shift to other, less desirable grazing areas. A required shift to new grazing land could also lead to increased transportation costs. Similar project delays and modifications theoretically could be required for other small businesses that operate within the proposed critical habitat.
- 163. A small region in the vicinity of the south-easterly border of the proposed critical habitat designation is used for agricultural activities. While the critical habitat border is drawn to exclude almost all existing farmlands, a few abandoned fields are contained within the border. Critical

⁴⁴ 5 U.S.C. 601 et.seq.

habitat may also affect any small agricultural businesses planning on expanding their operations into the foothills. In general, land suitable for farming is not bighorn sheep habitat, and thus the operations of small agricultural businesses should not affect bighorn sheep critical habitat. In addition, the Service believes that any adverse economic effects caused by restrictions on farmland extension into the foothills would be attributable to the listing of the species and not an additional impact of critical habitat designation due to jeopardy concerns.

The affected Federal agencies indicate that any private economic activities taking place on proposed critical habitat would already be subject to consultation as the result of Recovery Plan implementation on the lands. In addition, the scale of most of these activities is generally not large enough to warrant project modification. In sum, the designation of critical habitat should not have a significant economic impact on small businesses.

3.4.2 Potential Impacts to Native American Tribes

- 165. Critical habitat designation currently is proposed for 29,461 acres of land belonging to the Morongo Band of Mission Indians, Agua Caliente Band of Cahuilla Indians, and Torres Martinez Desert Cahuilla Indians. As previously mentioned, these Tribes are currently working with the Service in accordance with the Presidential Memorandum to develop land management plans that provide protection for the bighorn sheep.
- The designation of critical habitat has the potential to intensify disagreements between the Torres Martinez Tribe and the Service. The Torres Martinez Band of Cuhilla Indians desire more evidence on the potential value of their land to bighorn sheep. The designation of critical habitat establishes the Service claim that the land has conservation value. This has the potential to intensify the disagreement between the Tribe and the Service, which may have implications for future cooperation regarding the protection of bighorn sheep.
- As mentioned above, the critical habitat proposal on the Morongo reservation is predominantly very steep terrain, with the potential for up to 100 acres of flatter topography that could be developed. The Service has coordinated with the Tribe but potential future land uses have not been discussed in detail. The Service estimates that consultations with the Morongo Tribe are unlikely in the near future.⁴⁵
- 168. Bighorn sheep critical habitat is not anticipated to impact the Agua Caliente Tribe in a significant manner. The Tribe is currently involved in conversations with the Service regarding bighorn sheep and plans to continue conversations. The Director of Planning for the Agua Caliente

⁴⁵A representative of the Morongo Tribe was not available for comment at the time of this analysis.

Tribe mentioned frustration over the lack of clear data regarding bighorn sheep habitat.⁴⁶ The designation of critical habitat may reduce some of this frustration by legally defining the extent of critical habitat.

Overall, critical habitat is not anticipated to have large effects on the affected Tribes and Tribal lands. Regulations in the baseline scenario such as the Presidential Memorandum and the listing of the bighorn sheep appear to have much larger effects on the Tribes than the designation of critical habitat.

3.4.3 Potential Impacts Associated with Project Delays and Property Values

- The incremental effect of the proposed designation of critical habitat on project delays is dependent on the specific nature of the project in question. Based on the proceeding analysis, many of the projects that undergo section 7 consultations are large development projects that require several permits and licenses. These additional requirements include CEQA, National Environmental Policy Act, and approvals by local zoning boards and city councils. Often, a section 7 consultation can be held at the same time as these other permitting processes. If the consultation is completed before the other processes are completed, any project delays would not be attributed to the consultation with the Service. For example, the Ritz-Carlton's Rancho Mirage golf course plan mentioned above has completed a formal section 7 consultation. As of October 2000, construction has not yet begun on the project as it was delayed by the Rancho Mirage City Council permitting process.⁴⁷ Thus, the project delay associated with the Ritz-Carlton's golf course plan can not be fully attributed to the section 7 consultation with the Service.
- 171. On the other hand, some project delays may be attributable to section 7 consultations. When a project has all of the other necessary permits and licenses, or it is waiting for the completion of a the Service consultation to proceed with other permitting processes, the section 7 consultation can cause project delays. The Service indicates that formal section 7 consultations are supposed to last 135 days or less, but that occasionally the nature of the project requires consultations to last a year or more. These project delays represent potential impacts for property owners and developers.
- 172. The proposed critical habitat designation may require section 7 consultations beyond those required under the listing of the species. In this case, these incremental consultations have the potential to create additional project delays for land owners and managers. Estimations of the

⁴⁶Personal communication with Director of Planning for the Agua Caliente Indian Tribe on August 28, 2000.

⁴⁷Natalie Singer, "Rancho Mirage development killed," *The Desert Sun,* July 22, 2000.

economic costs of these project delays are quantified in the "Potential Costs and Benefits Due to Critical Habitat" section above.

- The proposed critical habitat designation may affect private property values due to public perceptions about the development limitations. Public comments and public testimony received to date about the critical habitat proposal indicate that some people do not know what kind of restrictions will result if their land is included in the final critical habitat designation.⁴⁸ The Palm Springs Planning Department indicates that some residents are unsure whether they can water their lawns due to uncertainty about critical habitat.⁴⁹ The educational benefits of informational phone calls may reduce this uncertainty. Until clear and correct information regarding the implications of the proposed critical habitat designation can be distributed, this uncertainty may result in transient reductions in property values.
- On the other hand, many landowners are aware of the areas that the bighorn sheep occupy. Local newspapers have printed stories about prime sheep habitat on private property and sheep have been sighted in residential and urban areas.⁵⁰ Thus, many people know that bighorn sheep exist in the area and are endangered. Based on public comments received and public testimony, people are also aware that the presence of bighorn sheep may cause restrictions on activities that require a Federal involvement. Thus, the impacts on property values beyond the impacts of the listing of the bighorn sheep are likely to be limited.
- 175. The Service believes that critical habitat may increase the property values of lands outside the critical habitat designation. Because bighorn sheep have been seen in urban areas, many private landowners are unsure about whether they should consult with the Service over activities on their land. The critical habitat designation excludes most of these urban areas and thus reduces uncertainty about which landowners need to consult. This reduction in uncertainty may increase the property values of certain properties outside of the critical habitat designation. In addition, critical habitat designation may add to the overall conservation "feel" of the region. These impacts have the potential to raise certain property values.
- 176. The proposed designation of critical habitat may increase project delays and reduce property values in the region. Yet, some project delays are attributable to other permitting processes and

⁴⁸Public comments recorded at the *Public Hearing Regarding A Proposal to Designate Critical Habitat for the Endangered Peninsular Bighorn Sheep* in Palm Springs, CA on July 20, 2000.

⁴⁹Personal communication with Director of Planning and Building, City of Palm Springs, CA on September 12, 2000.

⁵⁰Lucas Velush, "Battle brews over choice desert land," *The Desert Sun*, May 7, 2000.

critical habitat may increase certain property values. The overall impacts will be negative for some landowners and managers and positive for others. As a result, this analysis does not attempt to quantify these effects due to their highly speculative nature and propensity to have offsetting effects.

REFERENCES

Bureau of Land Management, "Santa Rosa Wilderness", http://www.ca.blm.gov/caso/santar.htm, August 18, 2000.

California Resources Agency, Department of Fish and Game, "State and Federally Listed Endangered and Threatened Animals of California," July 2000, http://www.dfg.ca.gov/whdab/Animal2000 July.pdf, August 22, 2000

California Resources Agency, "Summary and Overview of the California Environmental Quality Act," November 12, 1998, http://ceres.ca.gov/topic/env_law/ceqa/summary.html, August 23, 2000.

David King, Deborah Flynn and William Shaw, "Total and Existence Values of a Herd of Desert Bighorn Sheep," *Western Regional Research Publication, W-133, Benefits & Costs in Natural Resources Planning*, 1988.

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.

George Hall and Deirdre Gaquin, editors, 1997 County and City Extra, Bernan Press, MD, 1997.

John D. Landis et al. Fixing CEQA: Options and Opportunities for Reforming the California Environmental Quality Act (Brief), California Policy Research Center, University of California, November 1995. http://www.ucop.edu/cprc/ceqa.html. October 9, 2000.

Letter from Vice President of Planning and Entitlements, KSL Development Corporation to Field Supervisor, Carlsbad Fish and Wildlife Office on August 4, 2000.

Letter from General Manager-Chief Engineer, Coachella Valley Water District to Field Supervisor, Carlsbad Fish and Wildlife Office on August 31, 2000.

Lucas Velush, "Battle brews over choice desert land," *The Desert Sun*, May 7, 2000.

Natalie Singer, "Rancho Mirage development killed," *The Desert Sun*, July 22, 2000.

Personal communication Ecologist/Botanist, BLM El Centro Office on August 25, 2000.

Personal communications with Dames and Moore, Inc., Dudek & Associates, Inc., Environ Associates, and Jones & Stokes on September 7-8, 2000.

Personal communications with Biologist, Carlsbad, CA Office between September 24 and October 12, 2000

Personal communication with Field Manager, BLM Palm Springs Office on August 23, 2000.

Personal communication with the California Resources Agency Office on September 11, 2000.

Personal communication with Outdoor Recreations Planner, BLM Palm Springs Office on August 23, 2000.

Personal communication with Senior Biologist for the Lands and Facilities Division, California Department of Fish and Game on August 25, 2000.

Personal communication with Director of Planning and Building, City of Palm Springs, CA on September 12, 2000.

Personal communication with Director of Planning for the Agua Caliente Indian Tribe on August 28, 2000.

Personal communication with Anza-Borrega Desert State Park Resource Ecologist on August 25, 2000.

Personal communication with Regional Permitting/Compliance Specialist, Granite Construction Company on October 10, 2000.

Presidential Memorandum, Government-to-Government Relations with Native American Tribal Governments, April 29, 1994.

Proposed Determination of Critical Habitat for the Peninsular Bighorn Sheep, July 5, 2000 (65 FR 41405).

Public comments at the *Public Hearing Regarding a Proposal to Designate Critical Habitat for the Endangered Peninsular Bighorn Sheep*, July 20, 2000.

Rancho Mirage, "Community Economic Profile, Riverside County," http://www.ranchomirage.org/economic.htm, September 6, 2000.

Riverside County Regional Parks, "Desert Parks," http://www.co.riverside.ca.us/activity/parks/desert.htm, August 30, 2000.

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

Town of Palm Desert, "Coachella Community Profile," http://palm-desert.org/bo/html/community.html, September 7, 2000.

- U.S. Bureau of Economic Analysis Regional Facts, http://www.bea.doc.gov/bea/regional/bearfacts/bf10/06/index.htm, September 6, 2000.
- U.S. Fish and Wildlife Service, *Draft Recovery Plan for the Bighorn Sheep in Peninsular Ranges*, 1999.