



ECONOMIC ANALYSIS OF CRITICAL
HABITAT DESIGNATION FOR THE QUINO
CHECKERSPOT BUTTERFLY

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LIST OF ACRONYMS

2001 DEA	<i>Draft Economic Analysis of Proposed Critical Habitat Designation for the Quino Checkerspot Butterfly</i>
the Act	Endangered Species Act
BAER	Burned Area Emergency Rehabilitation
BEC	Berkeley Economic Consulting
BLM	U.S. Bureau of Land Management
butterfly	Quino checkerspot butterfly (<i>Euphydryas editha quino</i>)
C.F.R.	Code of Federal Regulations
Cahuilla Band of Indians	Cahuilla Band of Mission Indians of the Cahuilla Reservation, California
CALTRANS	California Department of Transportation
Campo Band of Kumeyaay Indians	Campo Band of Diegueno Mission Indians of the Campo Reservation, California
CBP	U.S. Customs and Border Protection
CDFG	California Department of Fish and Game
CDPR	California Department of Parks and Recreation
CEQA	California Environmental Quality Act
CFE	Considered for exclusion
CNCCP	California Natural Community Conservation Planning Act
CNF	Cleveland National Forest
CNLM	Center for Natural Lands Management
CSLC	California State Lands Commission
DHS	U.S. Department of Homeland Security
DOD	Department of Defense
E.O.	Executive Order
<i>FR</i>	Federal Register
FWO	Fish and Wildlife Office
GIS	Geographic Information Systems
IEc	Industrial Economics, Incorporated
MSCP	Multiple Species Conservation Plan
MSHCP	Multiple Species Habitat Conservation Plan
NWR	National Wildlife Refuge
OMB	U.S. Office of Management and Budget
ORV	Off-road vehicle
PCEs	Primary constituent elements
PFD	Proposed for designation
RCLIS	Riverside County Land Information System
SANDAG	San Diego Association of Governments
SBNF	San Bernardino National Forest
SBREFA	Small Business Analysis and Energy Impact Analysis
SCAG	Southern California Association of Governments

SDGE	San Diego Gas and Electric
Service	U.S. Fish and Wildlife Service
TNC	The Nature Conservancy
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WRCOG	Western Riverside Council of Government

EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts resulting from the proposed critical habitat designation for the Quino checkerspot butterfly (*Euphydryas editha quino*, hereafter, "butterfly"). This report was prepared by Industrial Economics, Incorporated (IEc) and Berkeley Economic Consulting (BEC) under contract to the U.S. Fish and Wildlife Service (Service).
2. On January 17, 2008, the Service published a proposed rule to revise currently designated critical habitat for the butterfly.¹ The 10 proposed critical habitat units cover approximately 98,460 acres located in Riverside and San Diego counties, in California (see Exhibit ES-1).² These proposed critical habitat units (the study area) include: 54.7 percent private lands; 23.9 percent Federal lands; 7.9 percent State lands; 9.1 percent owned by city, county, or other local entities; and 4.4 percent Tribal lands of the Cahuilla Band of Mission Indians of the Cahuilla Reservation, California (Cahuilla Band of Indians) and the Campo Band of Diegueno Mission Indians of the Campo Reservation, California (Campo Band of Kumeyaay Indians). The Service is considering for exclusion 1,681 acres covered by the San Diego Multiple Species Conservation Plan's (MSCP) City of Chula Vista Subarea Plan (hereafter Chula Vista Subarea Plan), and 32,036 acres of non-Federal land within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).³
3. Exhibit ES-2 summarizes the total estimated impacts. The framework for this analysis (see Chapter 2), describes how costs are estimated. The primary purpose of the report is to differentiate between baseline conservation costs that will likely occur regardless of critical habitat designation and incremental costs that are specifically due to designation. The analysis investigates direct costs of conservation efforts, including: administration and management costs, program expenditures, and opportunity costs. It also looks at indirect costs that are the result of the influence of critical habitat designation upon other, non-Federal decision-makers. The analysis does not quantify benefits because the Service prefers to assess conservation benefits in biological terms. Impacts in areas considered for exclusion are sub-totaled separately in all post-designation exhibits; total impacts include the sub-total of areas considered for exclusion and the sub-total of areas not considered for exclusion.

¹ 73 FR 3328-3373.

² The Service has revised the total amount of acreage, the amount of acreage considered for exclusion, and the land ownership information for the areas proposed for critical habitat since the publication of the proposed rule. Written communication from Service Carlsbad Fish and Wildlife Office, September 22, 2008.

³ Chapter 1 provides detailed maps of all units, including areas considered for exclusion.

4. Detailed pre- and post-designation baseline impacts of existing regulations and post-designation incremental impacts of proposed critical habitat are presented by unit in Exhibits ES-3 through Exhibit ES-5.⁴ These impacts are presented separately for areas considered for exclusion.
5. The activities considered in this report are ranked by post-designation baseline impacts in Exhibit ES-6 and by incremental impacts in Exhibit ES-7. Detailed costs by time period and activity are presented throughout the report applying a discount rate of seven percent; the report tables are repeated in Appendix B applying a discount rate of three percent. Appendix C presents undiscounted stream of impacts.
6. This analysis describes economic impacts of butterfly conservation efforts associated with the following categories of activity: 1) residential development; 2) non-residential development; 3) activities on Tribal lands; and 4) habitat management and other activities. Administrative costs of consultations under section 7 of the Endangered Species Act (the Act) are incorporated into each Chapter corresponding to the activity for which the consultations are undertaken.
7. To address the uncertainty inherent in forecasting future residential development impacts, the analysis presents a low-end impact scenario and a high-end impact scenario. The scenarios do not provide a range of all possible impacts that may occur; rather the estimates for these two scenarios present the best estimates given low impact and high impact assumptions about how future residential development will be affected. The difference between the scenarios is primarily due to different forecast assumptions for residential development in Unit 9 (La Costa/Campo) and Unit 10 (Jacumba).

⁴ The “pre-designation” timeframe refers to the period starting when the butterfly was listed ending with the current proposed rule (1997 through 2007). The “post-designation” timeframe for this analysis is 2008 through 2030. In order to provide results of the economic analysis at a more refined geographic scale than at the entire unit level for unit 8, this analysis identifies census tracts in unit 8 by landowner type.

KEY FINDINGS

Regulatory Baseline: The Service is considering a substantial amount of land for exclusion: private land in Riverside County covered by the Western Riverside MSHCP and private land in San Diego County covered by the Chula Vista Sub-Area Plan. The private land within Unit 8 (Otay) is likely to come under the jurisdiction of the Quino Amendment to the San Diego County MSCP, which is pending approval. Unit 9 (La Posta / Campo) and Unit 10 (Jacumba) are the only units with privately held lands (and residential development potential) that are proposed for designation that are not anticipated to be covered by an HCP.

Total Post-designation Baseline Impacts: This analysis estimates that the total present value of potential post-designation baseline butterfly conservation efforts in the study area are from \$686 million to \$691 million through 2030, assuming a seven percent discount rate. These totals include areas under consideration for exclusion, which total \$128 million separately. The majority of impacts result from residential-related conservation efforts undertaken in compliance with existing or planned habitat conservation plans (HCPs).

The land not considered for exclusion contains part of the Campo Band of Kumeyaay Indian Reservation; conservation impacts in this area constitute the majority (two to three percent) of the remaining impacts. In areas considered for exclusion, impacts to residential development comprise more than 96 percent of total impacts. Impacts to non-residential development and habitat management expenditures make up the rest of the impacts in areas considered for exclusion, with between one and two percent of impacts each. Details concerning the post-designation baseline impacts follow:

In areas not considered for exclusion:

- **Residential Development:** Residential development conservation effort costs are estimated to be \$540 million to \$546 million, assuming a seven percent discount rate.
- **Impacts to Tribes:** Impacts to the Campo Band of Kumeyaay Indians are estimated to be between \$12.8 million and \$14.7 million, assuming a seven percent discount rate.

In areas considered for exclusion:

- **Residential Development:** Residential development conservation effort costs are estimated to be \$123 million, assuming a seven percent discount rate.

Total Incremental Impacts: The total present value of post-designation incremental impacts is forecast to be between \$13.1 million and \$50.4 million through 2030, assuming a seven percent discount rate. The present value of incremental impacts in areas considered for exclusion, taken separately, is forecast to be less than \$5,000. The majority of the incremental impacts are due to conservation efforts for forecast residential development in Unit 9 (La Posta / Campo) and Unit 10 (Jacumba) and on the Campo Band of Kumeyaay Indians Reservation in Unit 9. These impacts occur in areas not covered by existing or planned HCPs.

Impacts to residential development comprise between 60 and 86 percent of the total present value of incremental impacts. Land not considered for exclusion contains part of the Campo Band of Kumeyaay Indian Reservation; conservation impacts in this area constitute 13 to 38 percent of the remaining impacts. Impacts to lands considered for exclusion are negligible. Details for the post-designation incremental impacts follow:

In areas not considered for exclusion:

- **Residential Development:** Residential development conservation effort costs are estimated to be from \$7.99 million to \$43.3 million, assuming a seven percent discount rate. The wide range of estimates is due to uncertainty regarding whether the butterfly will be identified during pre-construction surveys of proposed project sites and whether a Federal nexus is present in Units 9 and 10, which are not covered by any existing or pending HCPs.
- **Impacts to Tribes:** Impacts to the Campo Band of Kumeyaay Indians are estimated to be between \$5.04 million and \$6.99 million, assuming a seven percent discount rate.

In areas considered for exclusion:

- **Non-residential Development:** Non-residential development conservation effort costs are estimated to be less than \$5,000. There are no residential development incremental impacts forecast in areas considered for exclusion.

Critical Habitat Units with Highest Impacts:

Baseline Impacts: In areas not considered for exclusion, census tracts 06073021302 and 06073010014 (within Unit 8) have the highest post-designation baseline impacts, \$443 million and \$53.7 million, respectively, assuming a seven percent discount rate. In areas considered for exclusion, census tract 06073013313 (Unit 8) has the highest impacts, \$84 million assuming a seven percent discount rate. These impacts are primarily due to reductions in residential development and the forecast purchase of offsetting habitat for development that is built within existing and pending HCPs.

Incremental Impacts: In areas not considered for exclusion, Units 9 and 10 have the highest incremental impacts, between \$8.0 million and \$23.3 million and between 5.1 million and \$27 million, respectively, assuming a seven percent discount rate. The range of estimates is due to uncertainty regarding whether the butterfly will be identified in pre-project surveys. In areas considered for exclusion, there are less than \$5,000 of estimated impacts.

EXHIBIT ES-1 LAND OWNERSHIP IN PROPOSED CRITICAL HABITAT

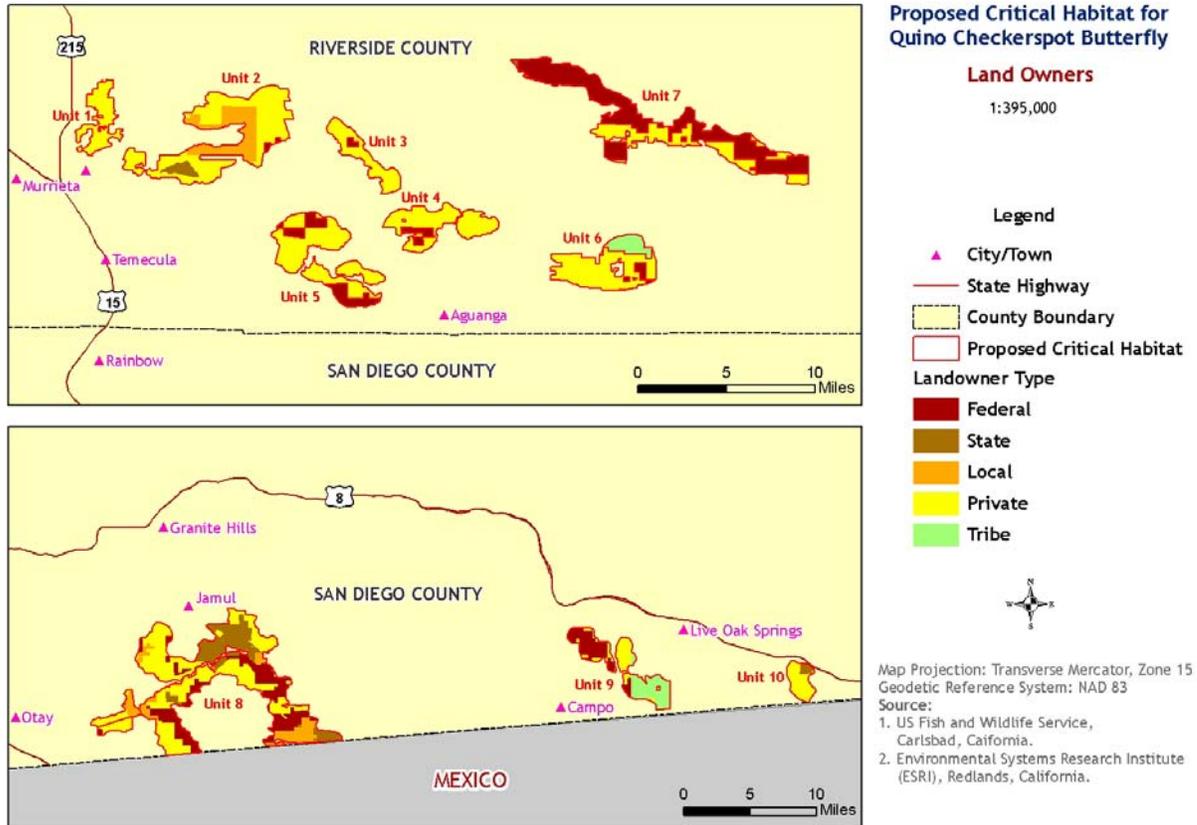


EXHIBIT ES-2 SUMMARY OF POST-DESIGNATION IMPACTS (2008 - 2030, 2008 DOLLARS)

	THREE PERCENT DISCOUNT RATE		SEVEN PERCENT DISCOUNT RATE	
	LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO
IMPACTS ATTRIBUTED TO EXISTING, BASELINE REGULATIONS				
Present Value Impacts	\$788,000,000	\$794,000,000	\$558,000,000	\$563,000,000
Annualized Impacts	\$46,500,000	\$46,900,000	\$46,300,000	\$46,700,000
CONSIDERED FOR EXCLUSION				
Present Value Impacts	\$179,000,000		\$128,000,000	
Annualized Impacts	\$5,580,000		\$9,040,000	
Total Present Value Impacts	\$967,000,000	\$973,000,000	\$686,000,000	\$691,000,000
IMPACTS ATTRIBUTED INCREMENTALLY TO CRITICAL HABITAT DESIGNATION (THE PROPOSED RULE)				
Present Value Impacts	\$18,400,000	\$70,700,000	\$13,100,000	\$50,400,000
Annualized Impacts ¹	\$1,090,000	\$4,170,000	\$1,090,000	\$4,180,000
CONSIDERED FOR EXCLUSION				
Present Value Impacts	\$4,850		\$4,670	
Annualized Impacts	\$287		\$387	
Total Present Value Impacts	\$18,400,000	\$70,700,000	\$13,100,000	\$50,400,000
Note: Totals may not sum due to rounding.				
(1) Some values are numerically different but rounding makes the annualized values appear to be the same.				

8. Exhibit ES-3 presents pre-designation baseline impacts by unit. Due to its large geographic area, Unit 8 is further subdivided by census tract. In areas not considered for exclusion, present value impacts are estimated to be \$207 million, assuming a seven percent discount rate. In areas considered for exclusion, present value impacts are an estimated \$67.6 million, assuming a seven percent discount rate. These costs are evidence of the significant regulatory protection that has been afforded this species since its listing in 1997, the previous designation of critical habitat in 2002, and the finalization of two regional HCPs covering the species in 2003.
9. Exhibit ES-4 presents the post-designation baseline impacts by unit, and in proposed Unit 8 by census tract. The differences in the low and high impact scenarios are overcome by the land value losses, which are the same for both scenarios. The largest post-designation baseline impacts for areas not considered for exclusion, \$443 million (assuming a seven percent discount rate) are found within census tract 06073021302 inside proposed Unit 8. Census tract 06073013313 (also within proposed Unit 8) has the largest baseline impacts of the areas considered for exclusion, \$84 million assuming a discount rate of seven percent. Within these units, impacts are dominated by effects on residential development

dictated by the proposed Quino Amendment under the San Diego County MSCP and the existing Chula Vista Subarea Plan, respectively.

10. Exhibit ES-5 presents the post-designation incremental impacts by unit, and census tract in Unit 8. Units 9 and 10 are likely to experience the largest incremental impacts in areas proposed for designation. Total post-designation incremental costs for areas not proposed for exclusion range from \$13.1 to \$50.4 million in present value terms assuming a seven percent discount rate. These costs result primarily from impacts to development in situations where project proponents do not identify the butterfly during surveys conducted prior to construction activities. Incremental impacts in areas considered for exclusion are relatively minor.
11. Exhibits ES-6 and ES-7 rank impacts by activity based on post-designation baseline and incremental impacts, respectively. In all cases, impacts resulting from residential development projects make up the majority of costs. Under baseline conditions (i.e., absent critical habitat) total impacts are dominated by large land value losses and the cost of purchasing compensation acres and paying mitigation fees under the existing and proposed HCPs. The proposed rule is also anticipated to result in the purchase of compensation acres as part of future residential and Tribal development projects.

KEY SOURCES OF UNCERTAINTY

12. In areas without existing or planned HCPs, the key factor determining whether incremental impacts are likely is the probability that project proponents will identify the butterfly during pre-construction surveys. This analysis relies on historical survey data to estimate a range of possible survey outcomes. To the extent that this analysis underestimates the likelihood that butterflies will be found in a proposed critical habitat unit it will over-state incremental impacts. Furthermore, the analysis also relies on growth projections from multiple municipal planning organizations; inaccuracies in the population forecasts may affect the report's results. Finally, the analysis assumes that an HCP under development will be adopted in its current form; any changes to the expected conservation efforts in the draft HCP could affect the impacts to development that have been estimated in this report.
13. The analysis includes estimated total present value impacts to the Campo Band of Kumeyaay Indians of between \$12.8 million and \$14.7 million (baseline) and between \$5.0 million and \$7.0 million (incremental), assuming a seven percent discount rate. These costs are primarily due to offsetting land purchases to accompany residential and non-residential development projects. Tribal land of the Cahuilla Band of Indians is also proposed for designation (Unit 6 - Tule Peak). The cost of conservation efforts for the butterfly and its habitat on the Cahuilla Band of Indians' Tribal lands are not estimated because their development plans do not yet specify implementation programs and dates for specific projects, thus no project modifications can be forecast. There are likely to be costs, but these cannot be forecast at this time.
14. Both of the affected Tribes face unique constraints relative to other jurisdictions potentially affected by critical habitat. Tribes do not have independent taxing authority

and therefore must rely on fees from development to generate Tribal income in order to provide social services. This revenue generating constraint makes potential critical habitat designation on Tribal development land potentially much more costly. If development constraints impinge on the Tribal ability to generate income, the estimates for impacts on the Tribes in Units 6 and 9 are likely to be under-stated.

**EXHIBIT ES-3 PRE-DESIGNATION BASELINE IMPACTS FOR ALL ACTIVITIES BY UNIT
(1997 - 2007, 2008 DOLLARS)**

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE (THREE PERCENT DISCOUNT RATE)	TOTAL PRESENT VALUE (SEVEN PERCENT DISCOUNT RATE)
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$669,000	\$832,000
6	Tule Peak		\$13,000	\$16,300
7	Bautista		\$190,000	\$232,000
8	Otay	06073010014	\$5,160,000	\$6,000,000
		06073010015	\$11,200,000	\$13,000,000
		06073013313	\$385,000	\$447,000
		06073021100	\$7,230,000	\$8,410,000
		06073021302	\$97,700,000	\$114,000,000
		06073021303	\$4,820,000	\$5,600,000
		06073021304	\$46,400,000	\$54,000,000
9	La Costa / Campo		\$1,900,000	\$2,370,000
10	Jacumba		\$2,340,000	\$2,430,000
Subtotal			\$178,000,000	\$207,000,000
CONSIDERED FOR EXCLUSION				
1	Warm Springs		\$11,700,000	\$15,900,000
2	Skinner/Johnson		\$30,500,000	\$41,200,000
3	Sage		\$19,400	\$22,100
4	Wilson Valley		\$76,300	\$88,400
5	Vail Lake/Oak Mountain		\$48,900	\$55,600
6	Tule Peak		\$37,100	\$42,200
7	Bautista		\$33,100	\$37,700
8	Otay	06073010014	\$2,110,000	\$2,440,000
		06073013313	\$6,430,000	\$7,460,000
		06073021302	\$270,000	\$314,000
Subtotal			\$51,200,000	\$67,600,000
TOTAL			\$229,000,000	\$274,000,000
Note: totals may not sum due to rounding.				

EXHIBIT ES-4 POST-DESIGNATION BASELINE IMPACTS FOR ALL ACTIVITIES BY UNIT (2008 - 2030, 2008 DOLLARS)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE (THREE PERCENT DISCOUNT RATE)		TOTAL PRESENT VALUE (SEVEN PERCENT DISCOUNT RATE)		ANNUALIZED (THREE PERCENT DISCOUNT RATE)		ANNUALIZED (SEVEN PERCENT DISCOUNT RATE)	
			LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO
2	Skinner/Johnson		\$23,600	\$23,600	\$16,800	\$16,800	\$1,400	\$1,400	\$1,400	\$1,400
3	Sage		\$27,800	\$27,800	\$19,800	\$19,800	\$1,640	\$1,640	\$1,640	\$1,640
4	Wilson Valley		\$103,000	\$103,000	\$73,700	\$73,700	\$6,110	\$6,110	\$6,110	\$6,110
5	Vail Lake/Oak Mountain		\$348,000	\$348,000	\$272,000	\$272,000	\$20,600	\$20,600	\$22,500	\$22,500
6	Tule Peak		\$110,000	\$110,000	\$81,500	\$81,500	\$6,490	\$6,490	\$6,760	\$6,760
7	Bautista		\$1,700,000	\$1,700,000	\$1,260,000	\$1,260,000	\$101,000	\$101,000	\$105,000	\$105,000
8	Otay	06073010014	\$76,000,000	\$76,000,000	\$53,700,000	\$53,700,000	\$4,490,000	\$4,490,000	\$4,450,000	\$4,450,000
		06073010015	\$9,810,000	\$9,810,000	\$7,180,000	\$7,180,000	\$579,000	\$579,000	\$595,000	\$595,000
		06073013313	\$57,600	\$57,600	\$41,100	\$41,100	\$3,400	\$3,400	\$3,410	\$3,410
		06073021100	\$7,100,000	\$7,100,000	\$5,010,000	\$5,010,000	\$419,000	\$419,000	\$416,000	\$416,000
		06073021302	\$627,000,000	\$627,000,000	\$443,000,000	\$443,000,000	\$37,000,000	\$37,000,000	\$36,700,000	\$36,700,000
		06073021303	\$9,640,000	\$9,640,000	\$6,840,000	\$6,840,000	\$569,000	\$569,000	\$567,000	\$567,000
		06073021304	\$25,300,000	\$25,300,000	\$17,900,000	\$17,900,000	\$1,490,000	\$1,490,000	\$1,480,000	\$1,480,000
9	La Posta/Campo		\$27,900,000	\$36,900,000	\$21,300,000	\$27,800,000	\$1,650,000	\$2,180,000	\$1,770,000	\$2,300,000
10	Jacumba ¹		\$2,410,000	\$41,700	\$1,710,000	\$29,700	\$142,000	\$2,460	\$142,000	\$2,460
Subtotal			\$788,000,000	\$794,000,000	\$558,000,000	\$563,000,000	\$46,500,000	\$46,900,000	\$46,300,000	\$46,700,000
CONSIDERED FOR EXCLUSION										
1	Warm Springs		\$37,900,000		\$27,600,000		\$1,220,000		\$1,970,000	
2	Skinner/Johnson		\$2,460,000		\$1,750,000		\$85,500		\$126,000	
3	Sage		\$1,130,000		\$807,000		\$36,100		\$57,200	
4	Wilson Valley		\$4,900,000		\$3,490,000		\$154,000		\$246,000	

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE (THREE PERCENT DISCOUNT RATE)		TOTAL PRESENT VALUE (SEVEN PERCENT DISCOUNT RATE)		ANNUALIZED (THREE PERCENT DISCOUNT RATE)		ANNUALIZED (SEVEN PERCENT DISCOUNT RATE)	
			LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO
5	Vail Lake/Oak Mountain		\$3,250,000		\$2,320,000		\$103,000		\$164,000	
6	Tule Peak		\$2,200,000		\$1,570,000		\$69,900		\$111,000	
7	Bautista		\$5,010,000		\$3,570,000		\$154,000		\$251,000	
8	Otay	06073010014	\$4,100,000		\$2,920,000		\$145,000		\$211,000	
		06073013313	\$118,000,000		\$84,000,000		\$3,600,000		\$5,900,000	
		06073021302	\$96,600		\$68,600		\$5,710		\$5,690	
Subtotal			\$179,000,000		\$128,000,000		\$5,580,000		\$9,040,000	
TOTAL			\$967,000,000	\$973,000,000	\$686,000,000	\$691,000,000	\$52,100,000	\$52,500,000	\$55,300,000	\$55,700,000

Note: Total may not sum due to rounding

(1) The range of forecasts for impacts in Unit 10 appear confusing, since the forecast impacts in the low scenario are greater than the forecast impacts in the high scenario. Total project modification impacts are divided between incremental and baseline impacts. The primary low and high impacts are assigned to the incremental impacts. The low forecasts of baseline impacts are the residuals left over from subtracting the incremental impacts from the total impacts.

EXHIBIT ES-5 POST-DESIGNATION INCREMENTAL IMPACTS FOR ALL ACTIVITIES BY UNIT (2008 - 2030, 2008 DOLLARS)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE (THREE PERCENT DISCOUNT RATE)		TOTAL PRESENT VALUE (SEVEN PERCENT DISCOUNT RATE)		ANNUALIZED (THREE PERCENT DISCOUNT RATE)		ANNUALIZED (SEVEN PERCENT DISCOUNT RATE)	
			LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO
2	Skinner/Johnson		\$0		\$0		\$0		\$0	
3	Sage		\$0		\$0		\$0		\$0	
4	Wilson Valley		\$0		\$0		\$0		\$0	
5	Vail Lake/Oak Mountain		\$11,500		\$8,830		\$678		\$732	
6	Tule Peak		\$547		\$458		\$32		\$38	
7	Bautista		\$0		\$0		\$0		\$0	
8	Otay	06073010014	\$0		\$0		\$0		\$0	
		06073010015	\$1,040		\$873		\$62		\$72	
		06073013313	\$0		\$0		\$0		\$0	
		06073021100	\$53		\$45		\$3		\$4	
		06073021302	\$11,300		\$9,510		\$670		\$789	
		06073021303	\$0		\$0		\$0		\$0	
		06073021304	\$332		\$278		\$20		\$23	
9	La Posta/Campo		\$11,300,000	\$32,700,000	\$8,030,000	\$23,300,000	\$665,000	\$1,930,000	\$666,000	\$1,930,000
10	Jacumba		\$7,110,000	\$38,000,000	\$5,060,000	\$27,000,000	\$420,000	\$2,240,000	\$420,000	\$2,240,000
Subtotal ¹			\$18,400,000	\$70,700,000	\$13,100,000	\$50,400,000	\$1,090,000	\$4,170,000	\$1,090,000	\$4,180,000
CONSIDERED FOR EXCLUSION										
1	Warm Springs		\$4,850		\$4,670		\$287		\$387	
2	Skinner/Johnson		\$0		\$0		\$0		\$0	
3	Sage		\$0		\$0		\$0		\$0	
4	Wilson Valley		\$0		\$0		\$0		\$0	

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE (THREE PERCENT DISCOUNT RATE)		TOTAL PRESENT VALUE (SEVEN PERCENT DISCOUNT RATE)		ANNUALIZED (THREE PERCENT DISCOUNT RATE)		ANNUALIZED (SEVEN PERCENT DISCOUNT RATE)	
			LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO
5	Vail Lake/Oak Mountain		\$0		\$0		\$0		\$0	
6	Tule Peak		\$0		\$0		\$0		\$0	
7	Bautista		\$0		\$0		\$0		\$0	
8	Otay	06073010014	\$0		\$0		\$0		\$0	
		06073013313	\$0		\$0		\$0		\$0	
		06073021302	\$0		\$0		\$0		\$0	
Subtotal			\$4,850		\$4,670		\$287		\$387	
TOTAL ¹			\$18,400,000	\$70,700,000	\$13,100,000	\$50,400,000	\$1,090,000	\$4,170,000	\$1,090,000	\$4,180,000
Note: Total may not sum due to rounding (1) Some values are numerically different but rounding makes the annualized values appear to be the same.										

EXHIBIT ES-6 ACTIVITIES RANKED TOTAL PRESENT VALUE POST-DESIGNATION BASELINE IMPACTS (2008 - 2030, 2008 DOLLARS)

ACTIVITY	LOW SCENARIO				HIGH SCENARIO			
	THREE PERCENT DISCOUNT RATE		SEVEN PERCENT DISCOUNT RATE		THREE PERCENT DISCOUNT RATE		SEVEN PERCENT DISCOUNT RATE	
	ESTIMATED IMPACTS	PERCENT OF TOTAL						
Residential Development	\$764,000,000	96.95%	\$540,000,000	96.77%	\$773,000,000	97.36%	\$546,000,000	96.98%
Tribal Activities ¹	\$19,400,000	2.46%	\$14,700,000	2.63%	\$16,700,000	2.10%	\$12,800,000	2.27%
Habitat Management	\$2,660,000	0.34%	\$2,010,000	0.36%	\$2,660,000	0.34%	\$2,010,000	0.36%
Non residential Development	\$1,910,000	0.24%	\$1,910,000	0.34%	\$1,910,000	0.24%	\$1,910,000	0.35%
Subtotal	\$788,000,000	100.00%	\$558,000,000	100.00%	\$794,000,000	100.00%	\$563,000,000	100.00%
CONSIDERED FOR EXCLUSION								
Residential Development	\$173,000,000	96.65%	\$123,000,000	96.09%	\$173,000,000	96.65%	\$123,000,000	96.09%
Non residential Development	\$2,700,000	1.51%	\$2,550,000	1.99%	\$2,700,000	1.51%	\$2,550,000	1.99%
Habitat Management	\$3,120,000	1.74%	\$2,220,000	1.73%	\$3,120,000	1.74%	\$2,220,000	1.73%
Tribal Activities	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%
Subtotal	\$179,000,000	100.00%	\$128,000,000	100.00%	\$179,000,000	100.00%	\$128,000,000	100.00%
TOTAL	\$967,000,000		\$686,000,000		\$973,000,000		\$691,000,000	

Note: Totals may not sum due to rounding.

(1) The range of forecasts for impacts on Tribal Activities appear confusing, since the forecast impacts in the low scenario are greater than the forecast impacts in the high scenario. Total project modification impacts are divided between incremental and baseline impacts. The primary low and high impacts are assigned to the incremental impacts. The low forecasts of baseline impacts are the residuals left over from subtracting the incremental impacts from the total impacts.

EXHIBIT ES-7 ACTIVITIES RANKED BY LEVEL OF TOTAL POST-DESIGNATION INCREMENTAL IMPACTS (2008 - 2030, 2008 DOLLARS)

ACTIVITY	LOW END SCENARIO				HIGH END SCENARIO			
	DISCOUNTED AT THREE PERCENT		DISCOUNTED AT SEVEN PERCENT		DISCOUNTED AT THREE PERCENT		DISCOUNTED AT SEVEN PERCENT	
	ESTIMATED IMPACTS	PERCENT OF TOTAL						
Residential Development	\$11,200,000	60.87%	\$7,990,000	60.99%	\$60,800,000	86.00%	\$43,300,000	85.91%
Tribal Activities	\$7,070,000	38.42%	\$5,040,000	38.47%	\$9,810,000	13.88%	\$6,990,000	13.81%
Habitat Management	\$69,100	0.38%	\$64,000	0.49%	\$69,100	0.10%	\$64,000	0.13%
Non residential Development	\$24,700	0.13%	\$22,900	0.17%	\$24,700	0.03%	\$22,900	0.05%
Subtotal	\$18,400,000	100.00%	\$13,100,000	100.00%	\$70,700,000	100.00%	\$50,400,000	100.00%
CONSIDERED FOR EXCLUSION								
Non-Residential Development	\$4,850	100.00%	\$4,670	100.00%	\$4,850	100.00%	\$4,670	100.00%
Residential Development	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%
Habitat Management	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%
Tribal Activities	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%
Subtotal	\$4,850	100.00%	\$4,670	100.00%	\$4,850	100.00%	\$4,670	100.00%
TOTAL	\$18,400,000		\$13,100,000		\$70,700,000		\$50,400,000	
Note: Total may not sum due to rounding								

CHAPTER 1 | INTRODUCTION

15. The purpose of this report is to estimate the economic impact of the proposed revision to critical habitat for the federally listed Quino checkerspot butterfly (*Euphydryas editha quino*, hereafter, “butterfly”). The report was prepared collaboratively by Industrial Economics, Incorporated (IEc) and Berkeley Economic Consulting (BEC) for the U.S. Fish and Wildlife Service (Service).
16. This analysis identifies the incremental effects of the proposed rule by estimating the impacts of two scenarios, one “without critical habitat” and the other “with critical habitat.” The difference between the two represents the costs of the proposed rule. This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation, unless such exclusion would result in the extinction of the species.⁵ In addition, this information allows the Service to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).⁶ Detailed discussion of the framework for this analysis is provided in Chapter 2.

1.1 LOCATION AND LAND OWNERSHIP

17. The butterfly was listed as endangered under the Act in 1997. In 2002 an area including 171,605 acres in Riverside and San Diego counties, California was designated as critical habitat.⁷ That designation was challenged in court by the Homebuilders Association of Northern California, and in March 2006, the Service reached a settlement requiring that it re-evaluate the designation.⁸ In January 2008, the Service proposed to revise existing critical habitat, identifying 98,460 acres in 10 newly proposed units within the same two counties.⁹ These acres comprise the study area for this analysis, as discussed in greater detail in Chapter 2.

⁵ 16 U.S.C. §1533(b)(2).

⁶ Executive Order 12866, Regulatory Planning and Review, September 30, 1993 (as amended by Executive Order 13258 (2002) and Executive Order 13422 (2007)); Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001; 5. U.S.C. § 601 et seq; and Pub Law No. 104-121.

⁷ 62 FR 2313; 67 FR 18356.

⁸ As summarized in 73 FR 3333.

⁹ The Service has revised the total amount of acreage, the amount of acreage considered for exclusion, and the land ownership information for the areas proposed for critical habitat since the publication of the proposed rule. Written communication from Service Carlsbad Fish and Wildlife Office, September 22, 2008.

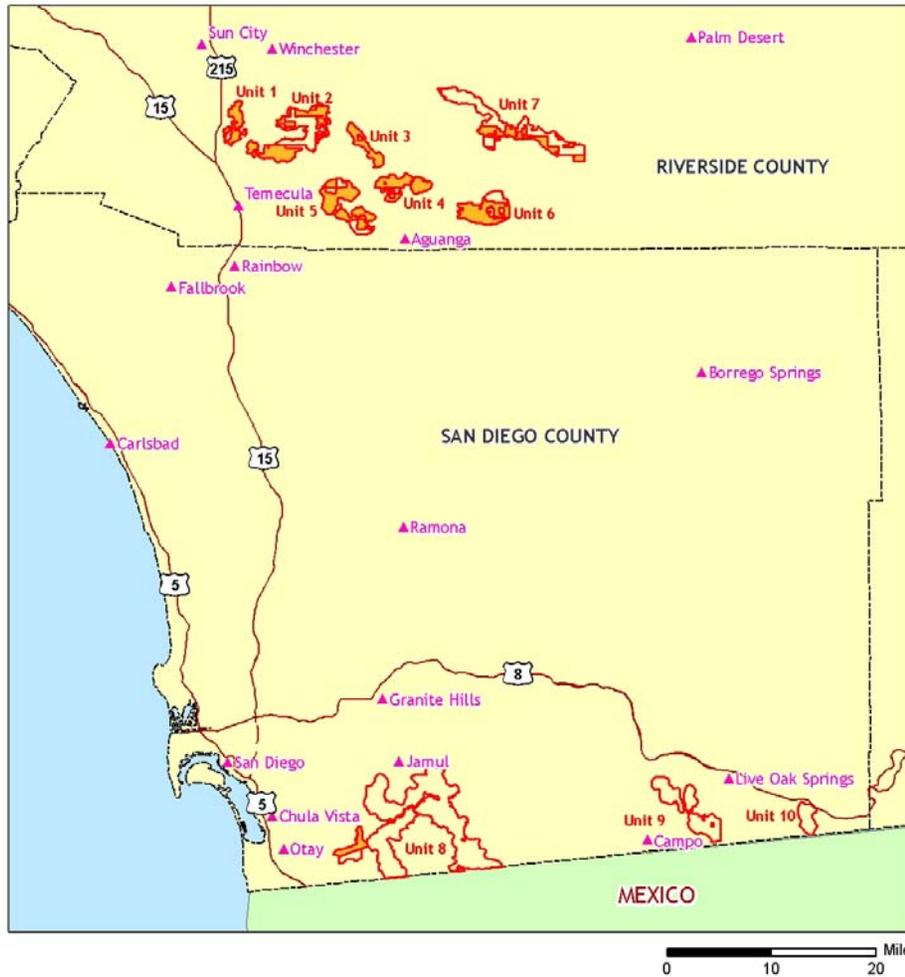
18. Although the overall acreage of critical habitat is reduced, the Service includes some previously undesignated lands.¹⁰ Furthermore, of the total acres proposed, the Service is considering excluding 1,681 acres of land within the San Diego County Multiple Species Conservation Plan's City of Chula Vista Subarea Plan (hereafter, Chula Vista Subarea Plan) and 32,036 acres of land in the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) area.¹¹
19. Exhibits 1-1 through 1-6 provide maps of the proposed critical habitat for the butterfly and indicate acres under consideration for exclusion from the final designation. Proposed Units 1 through 7 are located along the southern boundary of Riverside County. Proposed Units 8 through 10 are located in the southern half of San Diego County, extending down to the U.S.-Mexico border.
20. Exhibits 1-7 and 1-8 describe the distribution of land ownership, as identified in the proposed rule.¹² Private entities own the most land in the study area (53,850 acres or 54.7 percent of the total); almost two-thirds of that land is under consideration for exclusion from the final rule. The units also include 7,756 acres of California State lands (7.9 percent) and 9,001 acres (9.1 percent) of county, city land, and municipal water district land. The Service identifies 4,359 acres (4.4 percent of the total) of Tribal lands of the Cahuilla Band of Indians and the Campo Band of Kumeyaay Indians. The remaining 23,494 acres (23.8 percent) are Federal lands managed by the Service, the Bureau of Land Management (BLM), the U.S. Forest Service (USFS), and the Department of Defense (DOD).

¹⁰ See the proposed rule (73 *FR* 3338) for additional detail.

¹¹ 73 *FR* 3328.

¹² *Ibid.*

EXHIBIT 1-1 UNITS 1-10



Proposed Critical Habitat for Quino Checkerspot Butterfly

Units 1 - 10

1:709,000

Legend

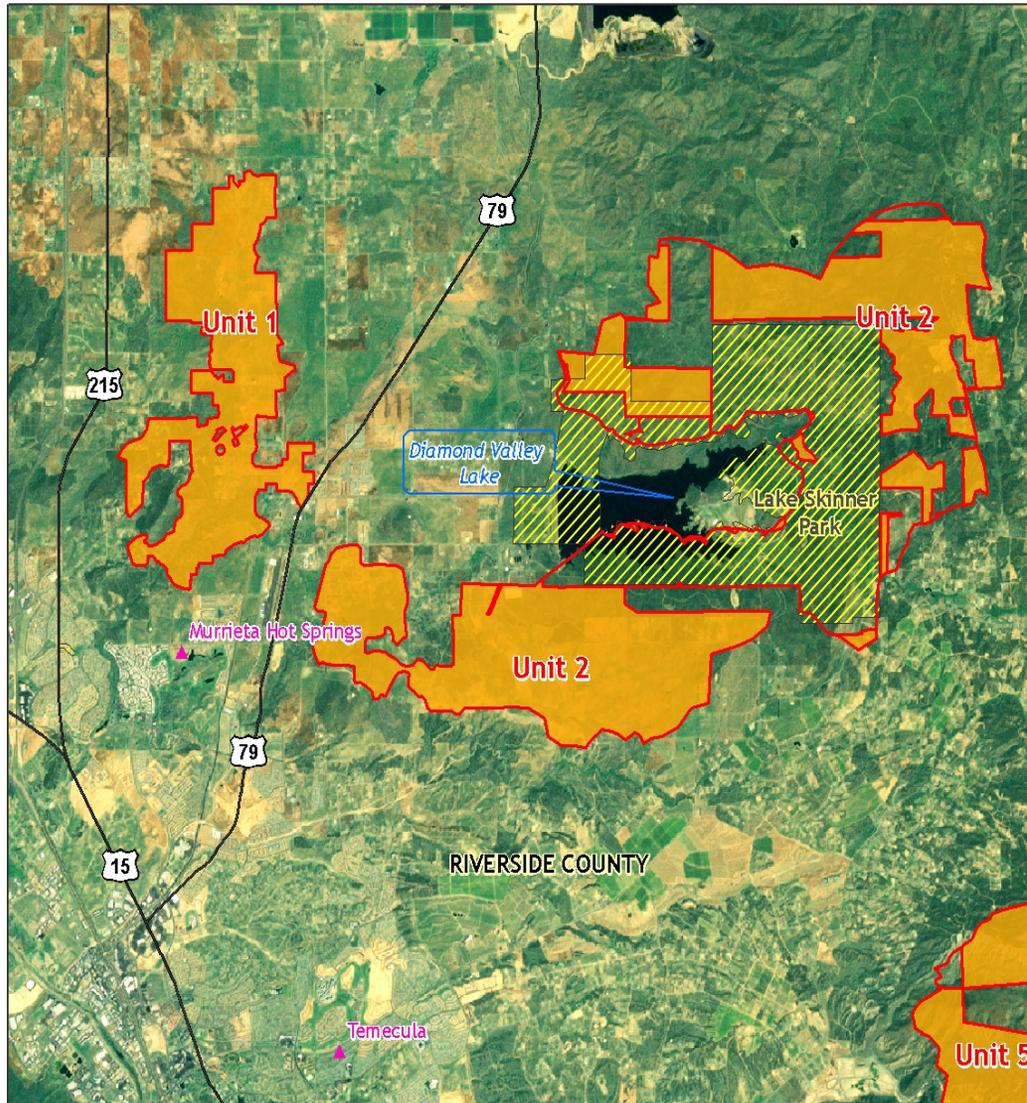
- ▲ City/Town
- State Highway
- County Boundary
- Proposed Critical Habitat
- Boundary
- Considered for Exclusion

Study Area



Map Projection: Transverse Mercator, Zone 15
 Geodetic Reference System: NAD 83
 Source:
 1. United States Fish and Wildlife Service
 2. Environmental Systems Research Institute, Inc. (ESRI)

EXHIBIT 1-2 UNITS 1 AND 2



Proposed Critical Habitat for Quino Checkerspot Butterfly
Unit 1: Warm Springs
Unit 2: Skinner/Johnson

1:102,000

Legend

▲ City/Town

— State Highway

qcb_fch832008

County Boundary

Proposed Critical Habitat

Boundary

Considered for Exclusion

Study Area



Map Projection: Transverse Mercator, Zone 15

Geodetic Reference System: NAD 83

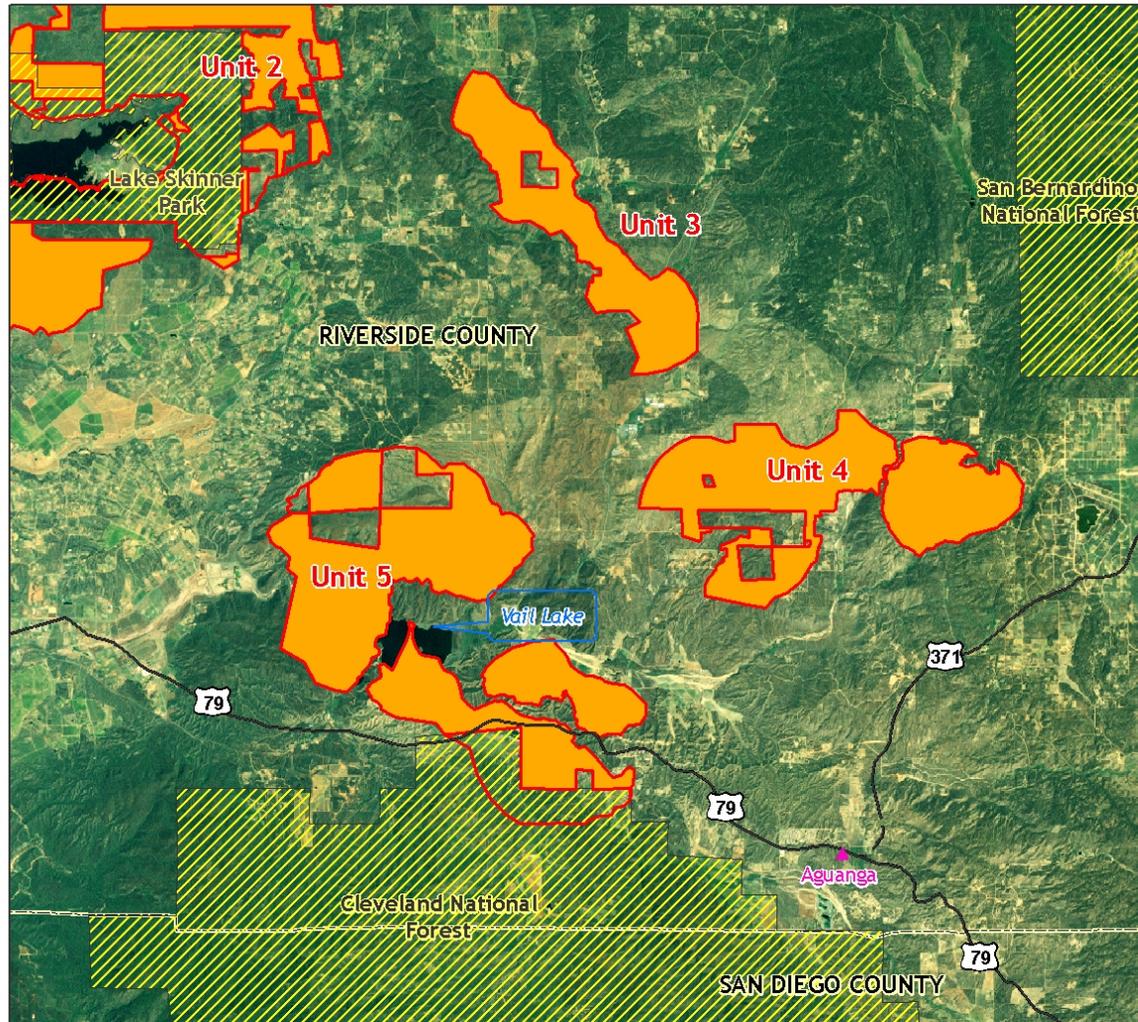
Source:

1. United States Fish and Wildlife Service
2. Environmental Systems Research Institute, Inc.

UNIT NAME	LANDOWNERS	LANDOWNER TYPE (ACRES)				
		FEDERAL	STATE	LOCAL	PRIVATE	TOTAL
1. Warm Springs	Private				2,684	2,684
2. Skinner/ Johnson	BLM, CDFG, City/County, Private	107	608	4,574	6,714	12,003



EXHIBIT 1-3 UNITS 3, 4 AND 5



Proposed Critical Habitat for Quino Checkerspot Butterfly

- Unit 3: Sage
- Unit 4: Wilson Valley
- Unit 5: Vail Lake/Oak Mountain

1:133,200

Legend

- ▲ City/Town
- State Highway
- ▨ Park/Forest
- ▭ County Boundary
- Proposed Critical Habitat**
- ▭ Boundary
- Considered for Exclusion

Study Area

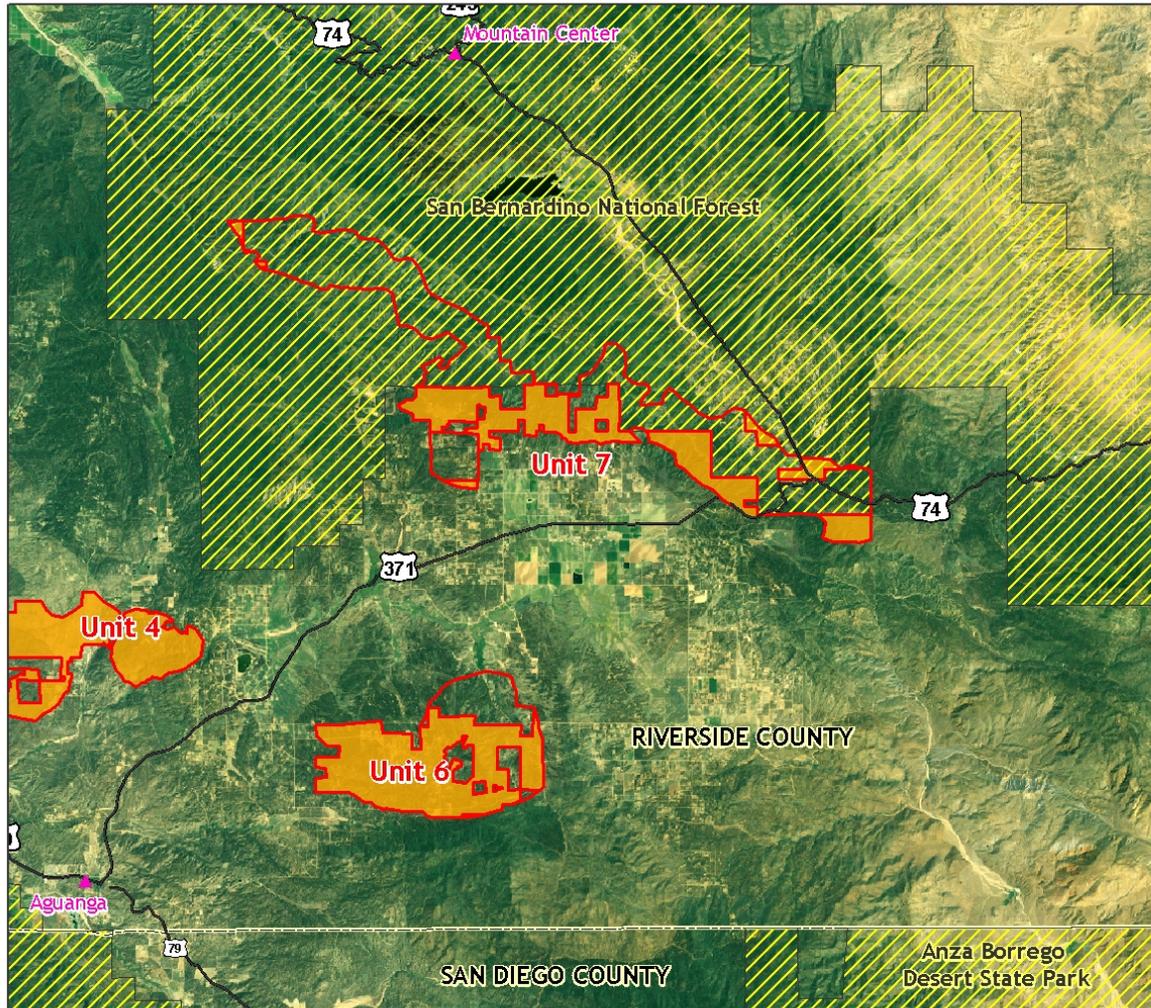


Map Projection: Transverse Mercator, Zone 15
 Geodetic Reference System: NAD 83
 Source:
 1. United States Fish and Wildlife Service
 2. Environmental Systems Research Institute, Inc. (ESRI)

UNIT NAME	LANDOWNERS / LAND MANAGERS	LANDOWNER TYPE (ACRES)					
		FEDERAL	STATE	LOCAL	TRIBE	PRIVATE	TOTAL
3. Sage	BLM, Private	126				2,567	2,693
4. Wilson Valley	BLM, Private	468				4,345	4,813
5. Vail Lake/Oak Mountain	BLM, CNF, Private	1,734				6,453	8,187



EXHIBIT 1-4 UNITS 6 AND 7



Proposed Critical Habitat for Quino Checkerspot Butterfly

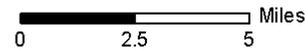
Unit 6: Tule Peak
Unit 7: Bautista

1:207,000

Legend

- ▲ City/Town
- State Highway
- ▨ Park/Forest
- ▭ County Boundary
- Proposed Critical Habitat**
- ▭ Boundary
- ▭ Considered for Exclusion

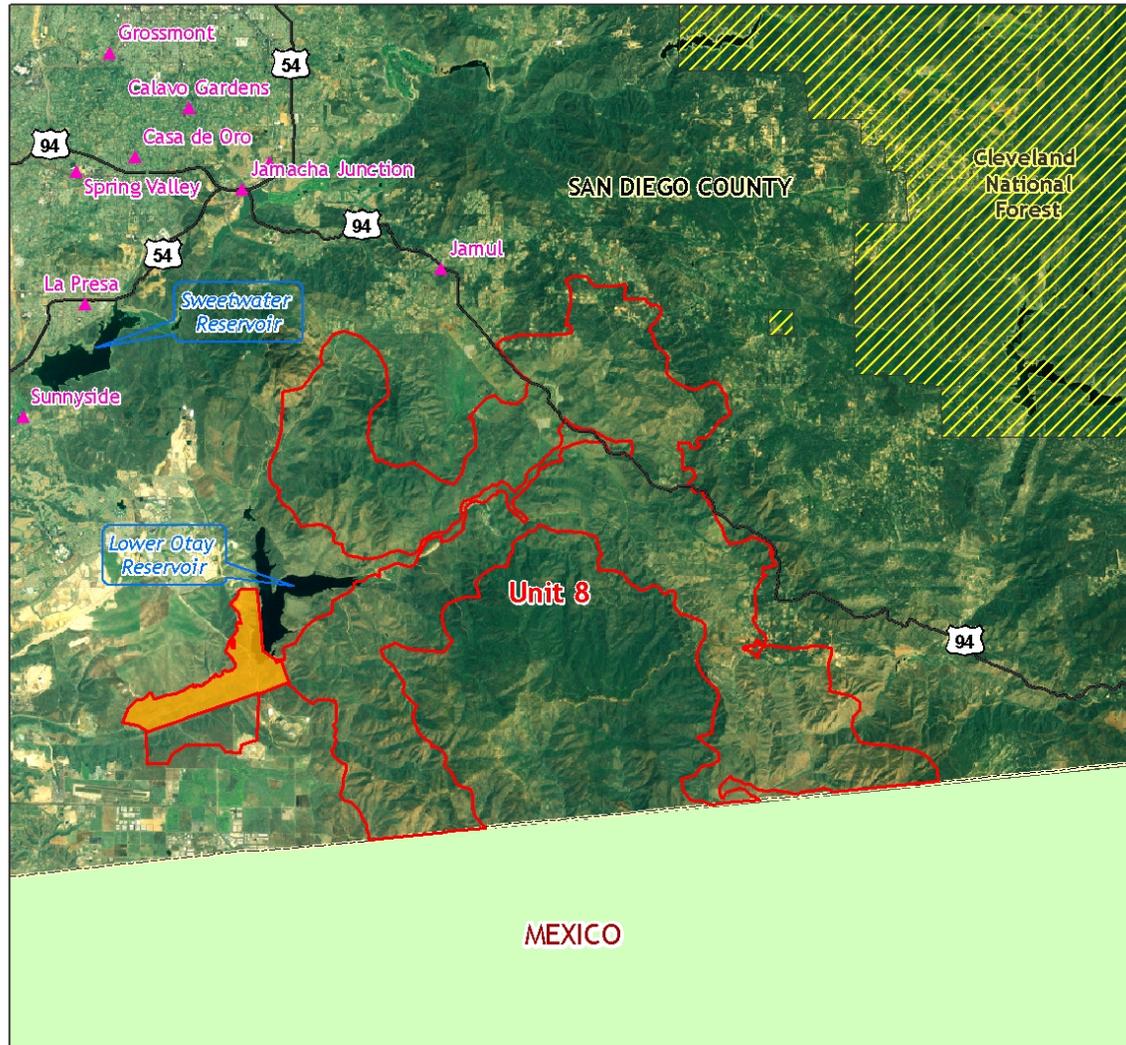
Study Area



Map Projection: Transverse Mercator, Zone 15
 Geodetic Reference System: NAD 83
 Source:
 1. United States Fish and Wildlife Service
 2. Environmental Systems Research Institute, Inc. (ESRI)

UNIT NAME	LANDOWNERS / LAND MANAGERS	LANDOWNER TYPE (ACRES)					
		FEDERAL	STATE	LOCAL	TRIBE	PRIVATE	TOTAL
6. Tule Peak	BLM, CDFG, Cahuilla Tribe, Private	328	321		1,203	4,581	6,433
7. Bautista	BLM, SBNF, CSLC, Private	9,643	74			4,297	14,014

EXHIBIT 1-5 UNIT 8



Proposed Critical Habitat for Quino Checkerspot Butterfly

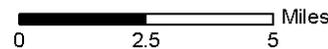
Unit 8: Otay
1:183,700

Legend

- ▲ City/Town
 - State Highway
 - ▨ Park/Forest
 - ▭ County Boundary
 - Proposed Critical Habitat**
 - ▭ Boundary
 - ▭ Considered for Exclusion
- Study Area



Map Projection: Transverse Mercator, Zone 15
 Geodetic Reference System: NAD 83
 Source:
 1. United States Fish and Wildlife Service
 2. Environmental Systems Research Institute, Inc. (ESRI)



UNIT NAME	LANDOWNERS / LAND MANAGERS	LANDOWNER TYPE (ACRES)					
		FEDERAL	STATE	LOCAL	TRIBE	PRIVATE	TOTAL
8. Otay	BLM, USFWS, DOD, CDFG, State, Local, Private	8,177	6,404	4,427		17,718	36,726

EXHIBIT 1-6 UNITS 9 AND 10

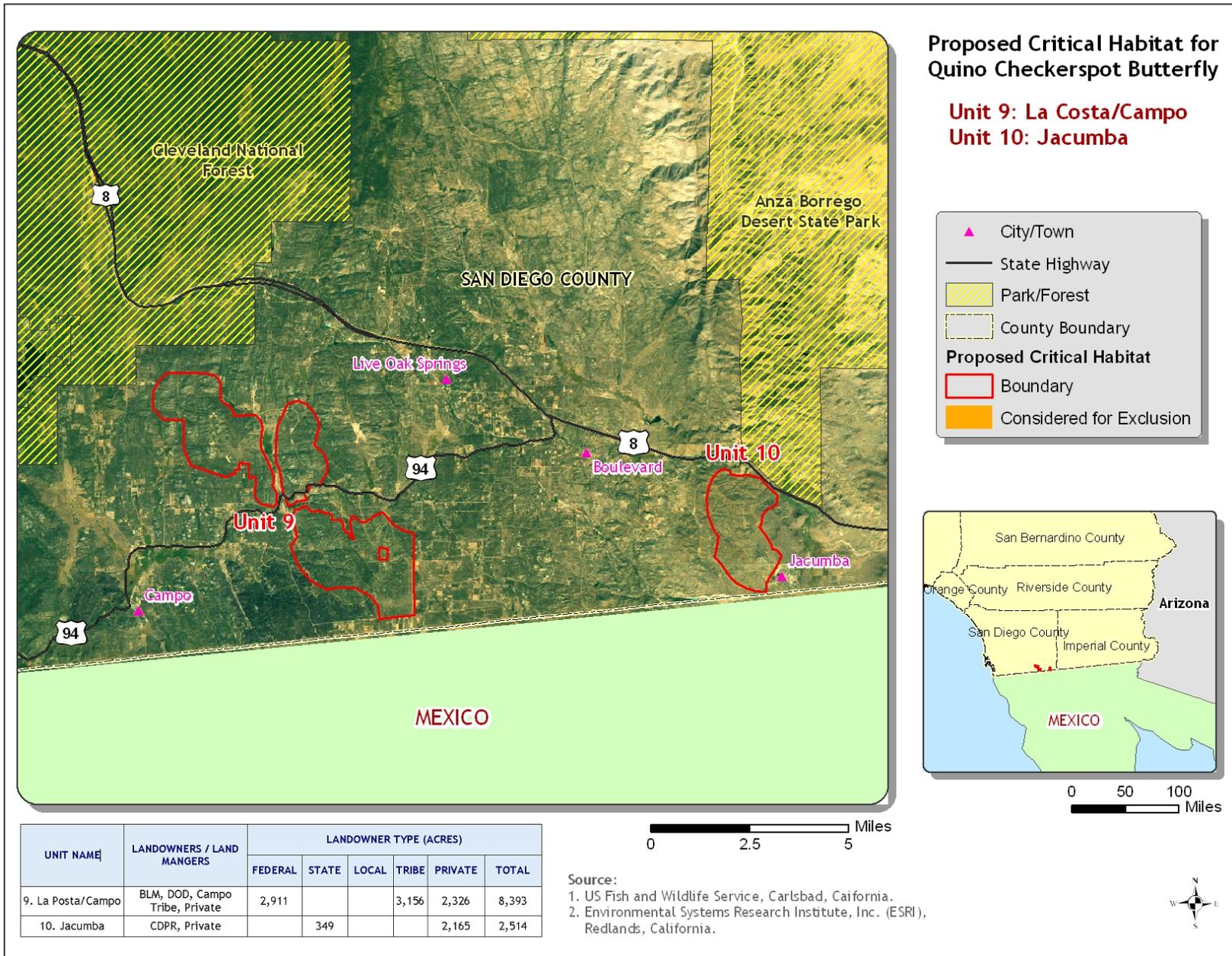
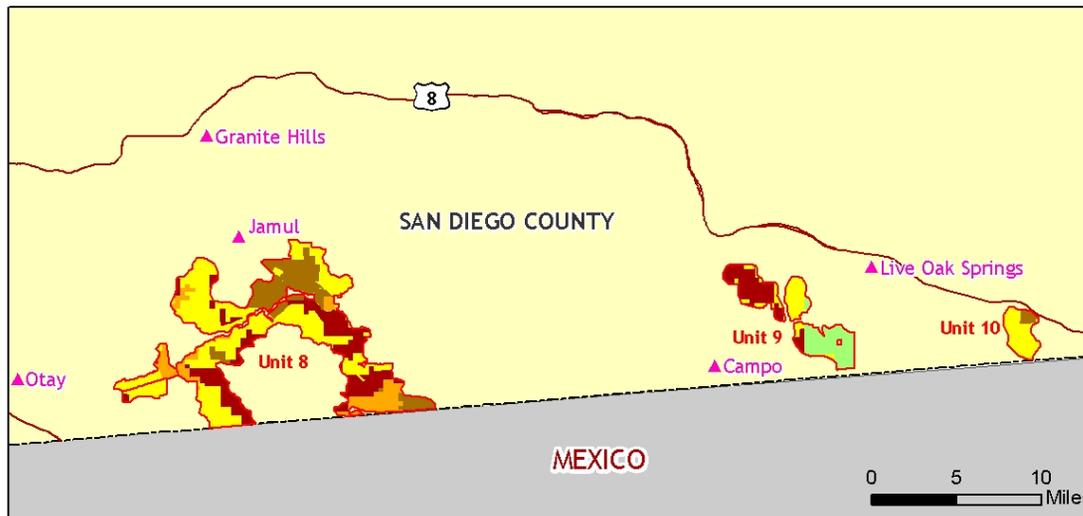
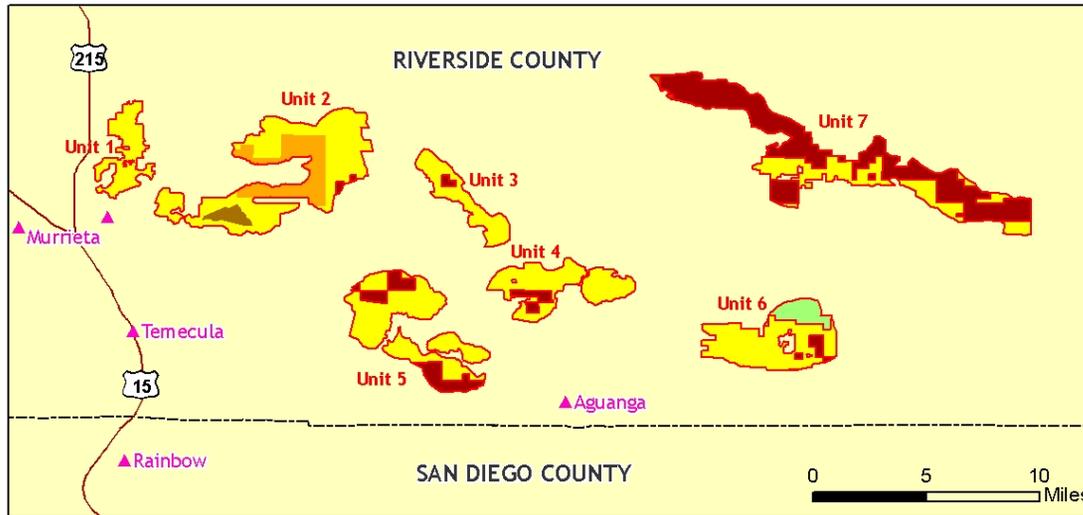


EXHIBIT 1-7 DISTRIBUTION OF LANDOWNERSHIP WITHIN PROPOSED CRITICAL HABITAT



Proposed Critical Habitat for Quino Checkerspot Butterfly

Land Owners

1:395,000

Legend

- ▲ City/Town
- State Highway
- County Boundary
- Proposed Critical Habitat

Landowner Type

- Federal
- State
- Local
- Private
- Tribe



Map Projection: Transverse Mercator, Zone 15
Geodetic Reference System: NAD 83

Source:

1. US Fish and Wildlife Service, Carlsbad, California.
2. Environmental Systems Research Institute (ESRI), Redlands, California.

EXHIBIT 1-8 LAND OWNERSHIP ACRES BY OWNERS AND PROPOSED CRITICAL HABITAT UNITS

	UNIT NAME	COUNTY	LANDOWNER TYPE (ACRES)					TOTAL
			FEDERAL ¹	STATE ²	LOCAL ³	TRIBE ⁴	PRIVATE	
2	Skinner/Johnson ⁵	Riverside	107	608	4,574			5,289
3	Sage	Riverside	126					126
4	Wilson Valley	Riverside	468					468
5	Vail Lake/Oak Mountain	Riverside	1,734					1,734
6	Tule Peak	Riverside	328			1,203		1,531
7	Bautista	Riverside	9,643					9,643
8	Otay	San Diego	8,177	6,404	3,706		16,758	35,045
9	La Posta/Campo	San Diego	2,911			3,156	2,326	8,393
10	Jacumba	San Diego		349			2,165	2,514
Subtotal			23,494	7,361	8,280	4,359	21,249	64,743
Areas Considered for Exclusion ⁶								
1	Warm Springs	Riverside					2,684	2,684
2	Skinner/Johnson ⁵	Riverside					6,714	6,714
3	Sage	Riverside					2,567	2,567
4	Wilson Valley	Riverside					4,345	4,345
5	Vail Lake/Oak Mountain	Riverside					6,453	6,453
6	Tule Peak	Riverside		321			4,581	4,902
7	Bautista	Riverside		74			4,297	4,371
8	Otay	San Diego			721		960	1,681
Subtotal			0	395	721	0	32601	33,717
TOTAL			23,494	7,756	9,001	4,359	53,850	98,460

Notes: Totals may not sum due to rounding.

(1) BLM, USFS, the Service, and DOD lands

(2) California Department of Fish & Game (CDFG), California State Lands Commission (CSLC), and California Department of Parks and Recreation (CDPR)

(3) City- or County-owned land

(4) Reservation lands of the Cahuilla Band of Indians and Campo Band of Kumeyaay Indians

(5) Note that the total acreage of Unit 2 was changed by the Service following publication of the proposed rule, which also changes the total amount of land proposed for critical habitat designation. The Service also changed the distribution of land ownership in Unit 2 from what was published in the proposed rule. This information is from a written communication from the Service, September 22, 2008.

(6) Lands managed under the San Diego County MSCP City of Chula Vista Subarea Plan and Western Riverside MSHCP in Riverside County

1.2 SUMMARY OF THREATS TO PROPOSED CRITICAL HABITAT

21. The proposed rule describes threats to proposed critical habitat, including:
- Development;
 - Habitat management;
 - Climate change and increasing atmospheric carbon dioxide concentration, nitrogen deposition and enhanced soil nitrogen;
 - Recreation; and
 - Grazing.¹³
22. Exhibit 1-9 provides a summary of the activities that could potentially harm proposed critical habitat. It identifies the potentially affected proposed units and specific threats that may be caused by each activity. The final column lists examples of several butterfly conservation measures to avoid, mitigate, or compensate for these threats. These measures were reported in the proposed rule, the section 7 consultation history, the recovery plan, and in communication with staff at the Service's Carlsbad Fish and Wildlife Office. These conservation measures are the basis of the economic impacts discussed in this analysis.

¹³ 73 FR 3336.

EXHIBIT 1-9 ACTIVITIES, THREATS, AND POTENTIAL CONSERVATION MEASURES FOR THE QUINO CHECKERSPOT BUTTERFLY

ACTIVITIES	AFFECTED UNITS	THREATS ⁽¹⁾	EXAMPLES OF SPECIAL MANAGEMENT TO AVOID, MITIGATE, OR COMPENSATE FOR THREAT
1. Residential, Commercial, Industrial, Utilities, and Infrastructure Development	All	<ul style="list-style-type: none"> o Loss and fragmentation of habitat and landscape connectivity o Habitat destruction and degradation o Mechanical soil disturbance, clearing or grading 	<ul style="list-style-type: none"> o Avoid development in some butterfly occupied areas. o Purchase conservation habitat to offset development. o Payment of conservation impact fees upon development
2. Habitat Management	1, 2, 3, 4, 5, 6, 8, 10	<ul style="list-style-type: none"> o Invasive nonnative annuals 	<ul style="list-style-type: none"> o Habitat restoration and control of invasive non-native species o Re-establish native plant communities o Invasive plant eradication and monitoring
	All	<ul style="list-style-type: none"> o Fire (wildfires) 	<ul style="list-style-type: none"> o Monitoring for the butterfly and its habitat prior to constructing fuel breaks and other fire management activities; implementing appropriate conservation measures if the butterfly is present
	4, 8	<ul style="list-style-type: none"> o Illegal trash dumping (62 <i>FR</i> 2313, as cited in FWS-SDG-2296.5) 	<ul style="list-style-type: none"> o Reduction of trash dumping o Enforcement to reduce dumping
	All	<ul style="list-style-type: none"> o Habitat fragmentation 	<ul style="list-style-type: none"> o Prudent design of managed habitat to include landscape connectivity (habitat) and ecological connectivity (wildlands that may not currently include habitat)
	1	<ul style="list-style-type: none"> o Mortality from traffic, roads 	<ul style="list-style-type: none"> o Build overpasses. Build fences or walls to keep butterflies off roads.
	ALL	<ul style="list-style-type: none"> o Habitat fragmentation and degradation over time 	<ul style="list-style-type: none"> o Monitoring, running propagation program, augmenting pCH units as necessary
	ALL	<ul style="list-style-type: none"> o Public ignorance about the butterfly and its habitat. 	<ul style="list-style-type: none"> o Educational outreach programs
3. Recreation	1, 2, 3, 4, 8, 10	<ul style="list-style-type: none"> o Illegal off-road vehicle activity 	<ul style="list-style-type: none"> o Enforcement to reduce illegal off-road vehicle use.
4. Grazing	5, 6, 7, 8, 9	<ul style="list-style-type: none"> o While grazing reduces non-native invasion, it also destroys the soil crusts that slow weed invasion. 	<ul style="list-style-type: none"> o Phased replacement of grazing with nonnative invasive plant control
5. Nitrogen Emissions from Transportation, Agriculture, and Industry	ALL	<ul style="list-style-type: none"> o Increased nitrogen in the soil benefits invasive nonnative species, which grow better in nitrogen rich environments. 	<ul style="list-style-type: none"> o Reduction of local nitrogen emissions from sources such as high traffic roads

ACTIVITIES	AFFECTED UNITS	THREATS ⁽¹⁾	EXAMPLES OF SPECIAL MANAGEMENT TO AVOID, MITIGATE, OR COMPENSATE FOR THREAT
6. Carbon Dioxide Emissions from Transportation, Agriculture, and Industry	ALL	<ul style="list-style-type: none"> ○ Increased carbon dioxide levels can lead to improved plant growth which can in turn increase the canopy cover, thus degrading the quality of butterfly habitat. ○ Increased carbon dioxide levels also increase larval mortality, development time, and decrease their biomass. 	<ul style="list-style-type: none"> ○ Conduct more research on the mechanisms and possible policy solutions.
7. Greenhouse Gas Emission Contributions to Climate Change	ALL	<ul style="list-style-type: none"> ○ Drier winters and springs have caused host plants to become less dense. ○ Changing temperature ranges in locations may be causing a northward shift in the host plants and butterflies. 	<ul style="list-style-type: none"> ○ Maintain connectivity between existing habitat clusters. Prevent further fragmentation. Habitat should be set up with connectivity to undeveloped lands where climate change may shift habitat.
8. Border Patrol Activity	8, 10	<ul style="list-style-type: none"> ○ Temporary and permanent destruction of habitat ○ Disruption of behavior and travel patterns of the butterfly. ○ Direct mortality to butterfly during construction and border patrolling activities. ○ Spread and potential establishment of nonnative invasive plant species during construction. 	<ul style="list-style-type: none"> ○ Use Best Management Practices for reducing impacts to the butterfly and its habitat during construction ○ Habitat restoration/mitigation to compensate for lost habitat following project completion.
<p>Notes:</p> <p>(1) Threats were identified through review of the proposed rule, consultation history, and discussion with the Service.</p>			

1.3 STRUCTURE OF THE REPORT

23. This remainder of this report is organized as follows:

- Chapter 2: Framework for the analysis;
- Chapter 3: Regulatory Baseline;
- Chapter 4: Potential Economic Impacts to Residential Development;
- Chapter 5: Potential Economic Impacts to Non-residential Development;
- Chapter 6: Potential Economic Impacts to Tribes;
- Chapter 7: Potential Economic Impacts Related to Species Management and Other Activities;
- References;

- Appendix A: Small Business Analysis and Energy Impacts Analysis;
- Appendix B: Detailed Tables Providing Alternative Impact Estimates Applying a Three Percent Discount Rate;
- Appendix C: Undiscounted Annual Costs;
- Appendix D: Selection of Level of Disaggregation for Reporting Results; and
- Appendix E: Technical Information for Impacts to Urban Development.

CHAPTER 2 | FRAMEWORK FOR THE ANALYSIS

24. The purpose of this report is to estimate the economic impact of the proposed rule designating critical habitat for the butterfly. The analysis examines the impacts of restricting or modifying specific land uses or activities for the benefit of the species and its habitat within the areas considered for critical habitat designation. This analysis employs "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections already accorded the butterfly; for example, under the Federal listing and other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat for the butterfly. The analysis looks retrospectively at baseline impacts incurred since the species was listed, and forecasts both baseline and incremental impacts likely to occur after the proposed critical habitat is finalized.¹⁴
25. This Chapter describes the framework for the analysis. First, it describes the case law that led to the selection of the framework applied in this report. It then describes in economic terms the general categories of economic effects that are the focus of regulatory impact analysis, including a discussion of both efficiency and distributional effects. Next, this Chapter defines the analytic framework used to measure these impacts in the context of critical habitat regulation, including the link between existing and critical habitat-related protection efforts and potential impacts, and the consideration of benefits. It concludes with a presentation of the information sources relied upon in the analysis and the structure of the report.

2.1 BACKGROUND

26. The U.S. Office of Management and Budget's (OMB) guidelines for conducting economic analysis of regulations direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action."¹⁵ In other words, the baseline includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e., occurring over and above existing constraints)

¹⁴ As discussed in Chapter 1, critical habitat was previously designated for this species in 2002. This analysis includes past impacts of that designation in the quantification of pre-designation (i.e. this rule) baseline because these impacts have already occurred and will not change if these areas are excluded from the new designation.

¹⁵ OMB, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

are attributable to the proposed regulation. Significant debate has occurred regarding whether assessing the impacts of the Service's proposed regulations using this baseline approach is appropriate in the context of critical habitat designations.

27. In 2001, the U.S. Tenth Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, regardless of whether those impacts are attributable co-extensively to other causes.¹⁶ Specifically, the court stated,

“The statutory language is plain in requiring some kind of consideration of economic impact in the CHD [critical habitat designation] phase. Although 50 C.F.R. 402.02 is not at issue here, the regulation's definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless. We are compelled by the canons of statutory interpretation to give some effect to the congressional directive that economic impacts be considered at the time of critical habitat designation.... Because economic analysis done using the FWS's [Fish and Wildlife Service's] baseline model is rendered essentially without meaning by 50 C.F.R. § 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes. Thus, we hold the baseline approach to economic analysis is not in accord with the language or intent of the ESA [Endangered Species Act].”¹⁷

28. Since that decision, however, courts in other cases have held that an incremental analysis of impacts stemming solely from the critical habitat rulemaking is proper.¹⁸ For example, in the March 2006 ruling that the August 2004 critical habitat rule for the Peirson's milk-vetch was arbitrary and capricious, the United States District Court for the Northern District of California stated,

“The Court is not persuaded by the reasoning of *New Mexico Cattle Growers*, and instead agrees with the reasoning and holding of *Cape Hatteras Access Preservation Alliance v. U.S. Dep't of the Interior*, 344 F. Supp 2d 108 (D.D.C. 2004). That case also involved a challenge to the Service's baseline approach and the court held that the baseline approach was both consistent with the language and purpose of the ESA and that it was a reasonable method for assessing the actual costs of a particular critical habitat designation *Id* at 130. ‘To find the true cost of a

¹⁶ *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

¹⁷ *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

¹⁸ *Cape Hatteras Access Preservation Alliance v. Department of Interior*, 344 F. Supp. 2d 108 (D.D.C.); *Center for Biological Diversity v. United States Bureau of Land Management*, 422 F. Supp/. 2d 1115 (N.D. Cal. 2006).

designation, the world with the designation must be compared to the world without it.”¹⁹

29. In order to address the divergent opinions of the courts and provide the most complete information to decision-makers, this economic analysis reports both:
- a. The baseline impacts of butterfly conservation from protections afforded the species absent critical habitat designation; and
 - b. The estimated incremental impacts precipitated specifically by the designation of critical habitat for the species.

Summed, these two types of impacts comprise the fully co-extensive impacts of butterfly conservation in areas considered for critical habitat designation.

30. Incremental effects of critical habitat designation are determined using the Service's December 9, 2004 interim guidance on “Application of the ‘Destruction or Adverse Modification’ Standard Under Section 7(a)(2) of the Endangered Species Act” and information from the Service regarding what potential consultations and project modifications may be imposed as a result of critical habitat designation over and above those associated with the listing.²⁰ Specifically, in *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, the Ninth Circuit invalidated the Service’s regulation defining destruction or adverse modification of critical habitat, and the Service no longer relies on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat.²¹ Under the statutory provisions of the Act, the Service determines destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional to serve its intended conservation role for the species. A detailed description of the methodology used to define baseline and incremental impacts is provided later in this Chapter.

2.2 CATEGORIES OF POTENTIAL ECONOMIC EFFECTS OF SPECIES CONSERVATION

31. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the butterfly and its habitat (hereinafter referred to collectively as “butterfly conservation efforts”). Economic efficiency effects generally reflect “opportunity costs” associated with the commitment of resources required to accomplish species and habitat conservation. For example, if the set of activities that may take place on a parcel of land is limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value

¹⁹ *Center for Biological Diversity et al, Plaintiffs, v. United States Bureau of Land Management et. al, Defendants and American Sand Association, et al, Defendant Intervenors*. Order re: Cross Motions for Summary Judgment, Case 3:03-cv-02509 Document 174 Filed 03/14/2006, pages 44-45.

²⁰ Director, U.S. Fish and Wildlife Service, Memorandum to Regional Directors and Manager of the California-Nevada Operations Office, Subject: Application of the “Destruction or Adverse Modification” Standard under Section 7(a)(2) of the Endangered Species Act, dated December 9, 2004.

²¹ *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, No. 03-35279 (9th Circuit 2004).

represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of butterfly conservation efforts.

32. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether the effects of species conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts. The differences between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

2.2.1 EFFICIENCY EFFECTS

33. At the guidance of OMB and in compliance with Executive Order 12866 "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect butterfly habitat, these efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.²²
34. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager, such as the U.S. Bureau of Land Management, may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets -- that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price -- the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.
35. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, protection measures that reduce or preclude the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in

²² For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich, Edward M., A Guide to Benefit-Cost Analysis (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, EPA 240-R-00-003, September 2000, available at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.

economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surpluses in the market.

36. This analysis begins by measuring impacts associated with efforts undertaken to protect the butterfly and its habitat. As noted above, in some cases, compliance costs can provide a reasonable estimate of changes in economic efficiency. In butterfly habitat, residential development projects experience the greatest impacts. However, the quantity and price of housing is not anticipated to be significantly affected. Instead, landowners within the units may experience losses in land value and developers may experience compliance costs. As a result, measurable changes in consumer and producer surplus are not anticipated.

2.2.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

37. Measurements of changes in economic efficiency focus on the net impact of conservation efforts, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.²³ This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

Impacts on Small Entities and Energy Supply, Distribution, and Use

38. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the Regulatory Flexibility Act, might be affected by future species conservation efforts.²⁴ In addition, in response to Executive Order 13211 "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future impacts of conservation efforts on the energy industry and its customers.²⁵

Regional Economic Effects

39. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g.,

²³ U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

²⁴ 5 U.S.C. §5601 et seq.

²⁵ Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

expenditures by recreators) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreators). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.

40. The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.
41. Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.
42. Impacts associated with butterfly conservation activities largely include land value losses and the costs of purchasing conservation acres or paying mitigation fees; the quantity of housing supplied in the broader region is not anticipated to be affected. Other types of projects are anticipated to go forward while incurring costs associated with surveying, monitoring, and habitat management. Therefore, measurable impacts of the type typically assessed with input-output models are not anticipated.

2.3 ANALYTIC FRAMEWORK AND SCOPE OF THE ANALYSIS

43. This analysis identifies those economic activities most likely to threaten the listed species and its habitat and, where possible, quantifies the economic impact to avoid or minimize such threats within the boundaries of the study area (the boundaries of the study area are discussed later in this Chapter).
44. This section provides a description of the methodology used to separately identify baseline impacts and incremental impacts stemming from the proposed designation of critical habitat for the butterfly. This evaluation of impacts in a "with critical habitat designation" versus a "without critical habitat designation" framework effectively measures the net change in economic activity associated with the proposed rulemaking.

2.3.1 IDENTIFYING BASELINE IMPACTS

45. The baseline for this analysis is the existing state of regulation, prior to the designation of critical habitat, which provides protection to the species under the Act, as well as under other Federal, State and local laws and guidelines. This "without critical habitat designation" scenario also considers a wide range of additional factors beyond the compliance costs of regulations that provide protection to the listed species. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by the Service and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.
46. Baseline impacts include sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections to the extent that they are expected to occur absent the designation of critical habitat for the species.
- Section 7 of the Act, absent critical habitat designation, requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. The portion of the administrative costs of consultations under the jeopardy standard, along with the impacts of project modifications resulting from consideration of this standard, are considered baseline impacts. Baseline administrative costs of section 7 consultation are summarized later in Exhibit 1-2.
 - Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."²⁶ The economic impacts associated with this section manifest themselves in sections 7 and 10.
 - Under section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for a listed animal species in order to meet the conditions for issuance of an incidental take permit in connection with the development and management of a property.²⁷ The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately avoided or minimized. The development and implementation of HCPs is considered a baseline protection for the species and habitat unless the HCP is determined to be precipitated by the designation of critical habitat, or the designation influences stipulated conservation efforts under HCPs.

²⁶ 16 U.S.C. 1532.

²⁷ U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at <http://endangered.fws.gov/hcp/>.

Enforcement actions taken in response to violations of the Act are not included in this analysis.

47. In the case of the butterfly, critical habitat was previously designated in 2002.²⁸ The impacts of historical efforts to conserve critical habitat are assigned to the baseline, as these costs have already been incurred and therefore are unaffected by the proposed rule. Furthermore, future impacts resulting from past decisions incorporating critical habitat concerns (e.g., the impacts associated with existing HCPs that incorporated the boundaries of the former designation) are also assigned to the baseline. These impacts are unlikely to be affected by a decision to not retain these areas as critical habitat.
48. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. If compliance with the Clean Water Act or State environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are categorized accordingly. Of note, however, is that such efforts may not be considered baseline in the case that they would not have been triggered absent the designation of critical habitat. In these cases, they are considered incremental impacts and are discussed below.

2.3.2 IDENTIFYING INCREMENTAL IMPACTS

49. This analysis separately quantifies the incremental impacts of this rulemaking. The focus of the incremental analysis is to determine the impacts on land uses and activities from the designation of critical habitat that are above and beyond those impacts due to existing required or voluntary conservation efforts being undertaken due to other Federal, State, and local regulations or guidelines.
50. When critical habitat is designated, section 7 requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to considering whether the actions are likely to jeopardize the continued existence of the species). The added administrative costs of including consideration of critical habitat in section 7 consultations, and the additional impacts of implementing project modifications resulting from the protection of critical habitat are the direct compliance costs of designating critical habitat. These costs are not in the baseline and are considered incremental impacts of the rulemaking.
51. Exhibit 2-1 depicts the decision analysis regarding whether an impact should be considered incremental. The following sections describe this decision tree in detail.
52. Incremental impacts may be the direct compliance costs associated with additional effort for forecast consultations, reinitiated consultations, new consultations occurring specifically because of the designation, and additional project modifications that would not have been required under the jeopardy standard. Additionally, incremental impacts may include indirect impacts resulting from reaction to the potential designation of

²⁸ 62 FR 2313.

critical habitat (e.g., developing habitat conservation plans) in an effort to avoid designation of critical habitat), triggering of additional requirements under State or local laws intended to protect sensitive habitat, and uncertainty and perceptual effects on markets.

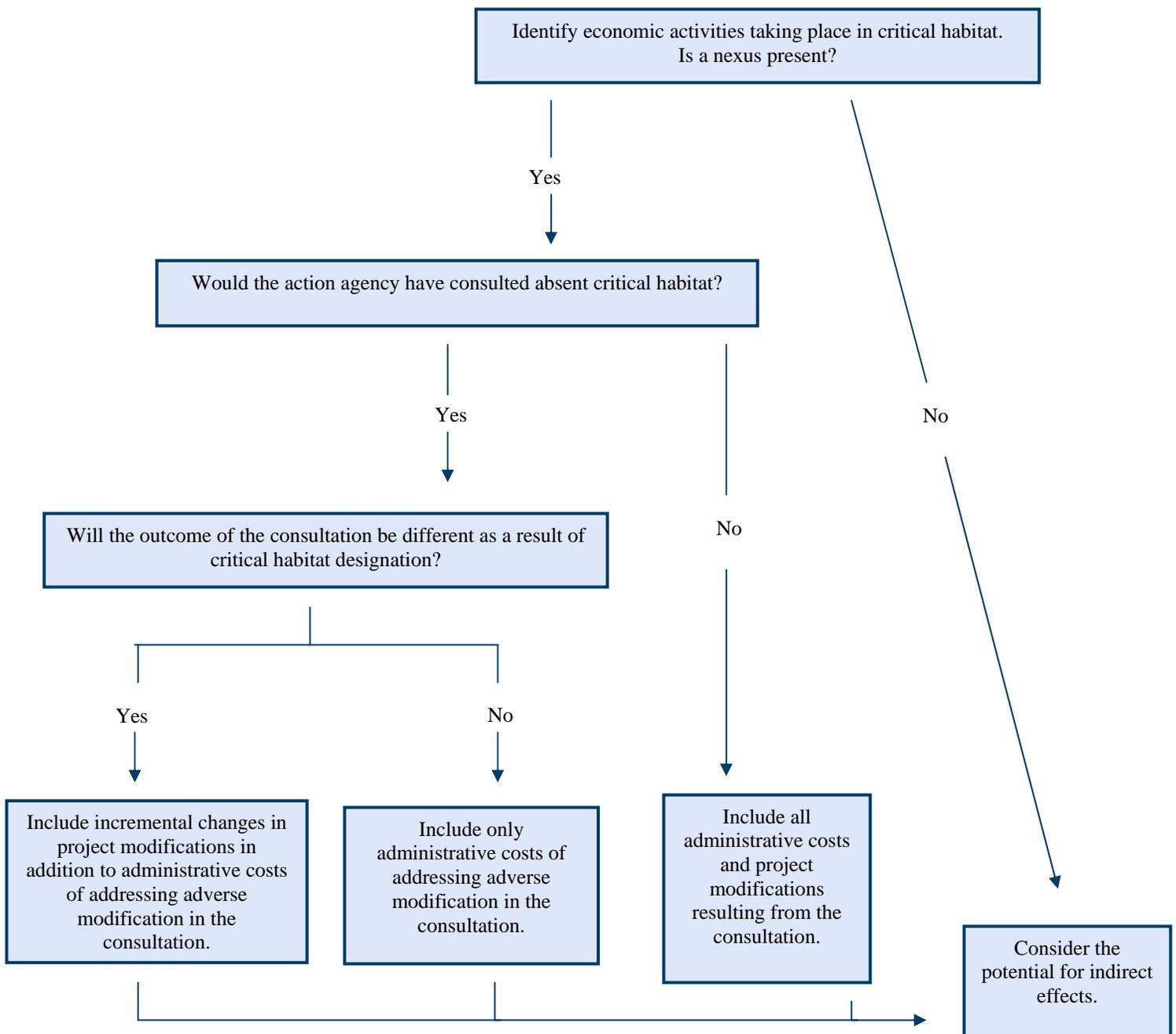
Direct Impacts

53. The direct, incremental impacts of critical habitat designation stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct, incremental impacts of critical habitat designation are: 1) the administrative costs of conducting section 7 consultation; and 2) implementation of any project modifications requested by the Service through section 7 consultation to avoid or minimize potential destruction or adverse modification of critical habitat.

Administrative Section 7 Consultation Costs

54. Parties involved in section 7 consultations include the Service, a Federal "action agency," and in some cases, a private entity involved in the project or land use activity. The action agency (i.e., the Federal nexus necessitating the consultation) serves as the liaison with the Service. While consultations are required for activities that involve a Federal nexus and may jeopardize the continued existence of the species regardless of whether critical habitat is designated, the designation may increase the effort for consultations in the case that the project or activity in question may adversely modify critical habitat. Administrative efforts for consultation may therefore result in both baseline and incremental impacts.

EXHIBIT 2-1 IDENTIFYING INCREMENTAL IMPACTS OF CRITICAL HABITAT DESIGNATION



55. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:
1. **Additional effort to address adverse modification in a new consultation** - New consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond the listing issues. In this case, only the additional administrative effort required to consider critical habitat is considered an incremental impact of the designation.
 2. **Re-initiation of consultation to address adverse modification -** Consultations that have already been completed on a project or activity may require re-initiation to address critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and project modification costs are considered incremental impacts of the designation.
 3. **Incremental consultation resulting entirely from critical habitat designation** - Critical habitat designation may trigger additional consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the potential presence of the species provided by the designation). Such consultations may, for example, be triggered in critical habitat areas that are not occupied by the species. All associated administrative and project modification costs of incremental consultations are considered incremental impacts of the designation.
56. The administrative costs of these consultations vary depending on the specifics of the project. One way to address this variability is to show a range of possible costs of consultation, as it may not be possible to predict the precise outcome of each future consultation in terms of level of effort. Review of consultation records and discussions with Service field offices resulted in a range of estimated administrative costs of consultation. For simplicity, the average of the range of costs in each category is applied in this analysis.
57. Exhibit 2-2 provides estimated administrative consultation costs representing effort required for all types of consultation, including those that considered both adverse modification and jeopardy. To estimate the fractions of the total administrative consultation costs that are baseline and incremental, the following assumptions were applied.
- The greatest effort will be associated with consultations that consider both jeopardy and adverse modification. Depending on whether the consultation is precipitated by the listing or the critical habitat designation, part or all of the costs, respectively, will be attributed to the proposed rule.

- Efficiencies exist when considering both jeopardy and adverse modification at the same time (e.g., in staff time saved for project review and report writing), and therefore incremental administrative costs of considering adverse modification in consultations precipitated by the listing result in the least incremental effort, roughly one-quarter of the cost of the entire consultation. The remaining three-quarters of the costs are attributed to consideration of the jeopardy standard in the baseline scenario. This latter amount also represents the cost of a consultation that only considers adverse modification (e.g., an incremental consultation for activities in unoccupied critical habitat) and is attributed wholly to critical habitat.
- Incremental costs of the re-initiation of a previously completed consultation because of the critical habitat designation are assumed to be approximately half the cost of a consultation considering both jeopardy and adverse modification. This assumes that re-initiations are less time-consuming as the groundwork for the project has already been considered in terms of its effect on the species. However, because the previously completed effort must be re-opened, they are more costly than simply adding consideration of critical habitat to a consultation already underway.

EXHIBIT 2-2 RANGE OF ADMINISTRATIVE CONSULTATIONS COSTS (2008 DOLLARS)

BASELINE ADMINISTRATIVE COSTS OF CONSULTATION					
CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
NEW CONSULTATION CONSIDERING JEOPARDY (DOES NOT INCLUDE CONSIDERATION OF ADVERSE MODIFICATION)					
Technical Assistance	\$405	n/a	\$788	n/a	\$1,130
Informal	\$1,760	\$2,250	\$1,540	\$1,500	\$7,130
Formal	\$3,980	\$4,500	\$2,630	\$3,600	\$15,000
Programmatic	\$12,000	\$9,940	n/a	\$4,200	\$26,100
INCREMENTAL ADMINISTRATIVE COSTS OF CONSULTATION					
CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
NEW CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION (TOTAL COST OF A CONSULTATION CONSIDERING BOTH JEOPARDY AND ADVERSE MODIFICATION)					
Technical Assistance	\$540	n/a	\$1,050	n/a	\$1,500
Informal	\$2,350	\$3,000	\$2,050	\$2,000	\$9,500
Formal	\$5,300	\$6,000	\$3,500	\$4,800	\$20,000
Programmatic	\$16,000	\$13,300	n/a	\$5,600	\$34,800
NEW CONSULTATION CONSIDERING ONLY ADVERSE MODIFICATION (UNOCCUPIED HABITAT)					
Technical Assistance	\$405	n/a	\$788	n/a	\$1,130
Informal	\$1,760	\$2,250	\$1,540	\$1,500	\$7,130
Formal	\$3,980	\$4,500	\$2,630	\$3,600	\$15,000
Programmatic	\$12,000	\$9,940	n/a	\$4,200	\$26,100
RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION					
Technical Assistance	\$270	n/a	\$525	n/a	\$750
Informal	\$1,180	\$1,500	\$1,030	\$1,000	\$4,750
Formal	\$2,650	\$3,000	\$1,750	\$2,400	\$10,000
Programmatic	\$7,980	\$6,630	n/a	\$2,800	\$17,400
ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION (ADDITIVE WITH BASELINE COSTS ABOVE OF CONSIDERING JEOPARDY)					
Technical Assistance	\$135	n/a	\$263	n/a	\$375
Informal	\$588	\$750	\$513	\$500	\$2,380
Formal	\$1,330	\$1,500	\$875	\$1,200	\$5,000
Programmatic	\$3,990	\$3,310	n/a	\$1,400	\$8,700
Source: IEC analysis of administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2008, and a review of consultation records from several Service field offices across the country conducted in 2002.					
Notes:					
1. Totals may not sum due to rounding.					
2. Estimates reflect average hourly time required by staff.					

Section 7 Project Modification Impacts

58. Section 7 consultation considering critical habitat may also result in additional project modification recommendations specifically addressing potential destruction or adverse modification of critical habitat. For forecast consultations considering jeopardy and adverse modification, and for re-initiations of past consultations to consider critical habitat, the economic impacts of project modifications undertaken to avoid or minimize adverse modification are considered incremental impacts of critical habitat designation. For consultations that are forecast to occur specifically because of the designation (incremental consultations), impacts of all associated project modifications are assumed to be incremental impacts of the designation. This is summarized below.
1. **Additional effort to address adverse modification in a new consultation** - Only project modifications above and beyond what would be requested to avoid or minimize jeopardy are considered incremental.
 2. **Re-initiation of consultation to address adverse modification** - Only project modifications above and beyond what was requested to avoid or minimize jeopardy are considered incremental.
 3. **Incremental consultation resulting entirely from critical habitat designation** - Impacts of all project modifications are considered incremental.

Indirect Impacts

59. The designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 under the Act. Indirect impacts are those unintended changes in economic behavior that may occur outside of the Act, through other Federal, State, or local actions, and that are caused by the designation of critical habitat. This section identifies common types of indirect impacts that may be associated with the designation of critical habitat. Importantly, these types of impacts are not always considered incremental. In the case that these types of conservation efforts and economic effects are expected to occur regardless of critical habitat designation, they are appropriately considered baseline impacts in this analysis.

Habitat Conservation Plans

60. Under section 10 of the Act, landowners seeking an incidental take permit must develop an HCP to counterbalance the potential harmful effects that an otherwise lawful activity may have on a species. As such, the purpose of the habitat conservation planning process is to ensure that the effects of incidental take are adequately avoided or minimized. Thus, HCPs are developed to ensure compliance with section 9 of the Act and to meet the requirements of section 10 of the Act.
61. Application for an incidental take permit and completion of an HCP are not required or necessarily recommended by a critical habitat designation. However, in certain situations the new information provided by the proposed critical habitat rule may prompt a landowner to apply for an incidental take permit. For example, a landowner may have

been previously unaware of the potential presence of the species on his or her property, and expeditious completion of an HCP may offer the landowner regulatory relief in the form of exclusion from the final critical habitat designation. In this case, the effort involved in creating the HCP and undertaking associated conservation actions are considered an incremental effect of designation. No specific plans to prepare new HCPs in response to this proposed designation were identified. As discussed in Chapter 3, efforts to amend the Multiple Species Conservation Program for San Diego County (San Diego County MSCP) began prior to the original proposal to designate critical habitat in 2001.

Other State and Local Laws

62. Under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation.
63. The California Environmental Quality Act (CEQA), for example, requires that lead agencies, public agencies responsible for project approval, consider the environmental effects of proposed projects that are considered discretionary in nature and not categorically or statutorily exempt. In some instances, critical habitat designation may trigger CEQA-related requirements. This is most likely to occur in areas where the critical habitat designation provides clearer information on the importance of particular areas as habitat for a listed species. In addition, applicants who were “categorically exempt” from preparing an Environmental Impact Report under CEQA may no longer be exempt once critical habitat is designated. In cases where the designation triggers the CEQA significance test or results in a reduction of categorically exempt activities, associated impacts are considered to be an indirect, incremental effect of the designation. Given the significant degree of previous regulation surrounding this species, described in Chapter 3, this designation is unlikely to provide the sole trigger for additional impacts under State and local laws.

Additional Indirect Impacts

64. In addition to the indirect effects of compliance with other laws or triggered by the designation, project proponents, land managers and landowners may face additional indirect impacts, including the following:
 - **Time Delays** - Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to reinstate the section 7 consultation process and/or compliance with other laws triggered by the designation. To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation. The impact of time delays are estimated in Chapters 4 and 6 of this report.
 - **Regulatory Uncertainty** - The Service conducts each section 7 consultation on a case-by-case basis and issues a biological opinion on formal consultations based

on species-specific and site-specific information. As a result, government agencies and affiliated private parties who consult with the Service under section 7 may face uncertainty concerning whether project modifications will be recommended by the Service and what the nature of these modifications will be. Where information suggests that this type of regulatory uncertainty stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. In the case of the butterfly, regulatory uncertainty has been significantly diminished by the completion of the Western Riverside County MSHCP and the Chula Vista Subarea Plan under the San Diego County MSCP. The butterfly is currently in the process of being added to the San Diego County Regional MSCP as an amendment which also decreases the regulatory uncertainty. The impact of interim voluntary development delays while this amendment is finalized is discussed in Chapter 4 of this report.

- **Stigma** - In some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated project modifications and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose real economic effects to property owners, regardless of whether such limits are actually imposed. All else equal, a property that is designated as critical habitat may have a lower market value than an identical property that is not within the boundaries of critical habitat due to perceived limitations or restrictions. As the public becomes aware of the true regulatory burden imposed by critical habitat, the impact of the designation on property markets may decrease. To the extent that potential stigma effects on markets are probable and identifiable, these impacts are considered indirect, incremental impacts of the designation. Stigma effects are possible in the case of the butterfly; however data limitations prevent their quantification in this analysis.

2.3.3 BENEFITS

65. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.²⁹ OMB's Circular A-4 distinguishes two types of economic benefits: *direct benefits and ancillary benefits*. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.³⁰
66. In the context of critical habitat, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation

²⁹ Executive Order 12866, Regulatory Planning and Review, September 30, 1993.

³⁰ U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.³¹ *Rather than rely on economic measures, the Service believes that the direct benefits of the proposed rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*

67. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.
68. It is often difficult to evaluate the ancillary benefits of critical habitat designation. To the extent that the ancillary benefits of the rulemaking may be captured by the market through an identifiable shift in resource allocation, they are factored into the overall economic impact assessment in this report. For example, if habitat preserves are created to protect a species, the value of existing residential property adjacent to those preserves may increase, resulting in a measurable positive impact. Where data are available, this analysis attempts to capture the *net* economic impact (i.e., the increased regulatory burden less any discernable offsetting market gains), of species conservation efforts imposed on regulated entities and the regional economy.

2.3.4 GEOGRAPHIC SCOPE OF THE ANALYSIS

69. The geographic scope of the analysis includes all land identified as proposed critical habitat, including the areas under consideration for exclusion from the final designation. Collectively, these locations are referred to as the "study area." Note that economic activities affecting critical habitat may be sited outside of the boundaries of the study area (e.g., upstream activities); these activities are considered relevant to this analysis. The study area does not include lands previously designated as critical habitat that are not included in this proposed revision, or other areas occupied by the butterfly that are not included in the proposed revision.
70. Results are presented by critical habitat unit. In Unit 8, the largest unit, impacts are further disaggregated by census tract.³² Disaggregation at this level is possible because

³¹ Ibid.

³² Census tracts are geographically defined data collection units of analysis established by the US Census Bureau to provide relatively stable analytic units for collection and analysis of demographic data. Census tracts generally contain between 2,500 and 8,000 residents, with an optimal size of 4,000 people. (US Census Bureau, 2000 Census of Population and Housing, *Summary Social, Economic, and Housing Characteristics, Selected Appendixes*, PHC-2-A, Washington DC, 2003.)

development is projected by regional planners by census tract. As shown in Appendix D, the geographic area of each of the remaining units is generally significantly smaller than a single census tract.

2.3.5 ANALYTIC TIME FRAME

71. The analysis estimates impacts based on activities that are "reasonably foreseeable," including, but not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. The analysis estimates economic impacts to activities from 1997 (year of the species' final listing) to 2030 (based on development projection forecasts obtained from local planning authorities). Estimated impacts are divided into pre-designation (1997-2007) and post-designation (2008-2030) impacts.³³
72. Where information is available to reliably forecast economic activity beyond the 23-year time frame, this analysis incorporates that information. Land value losses resulting from avoidance requirements are calculated assuming all future use of the land for housing is precluded. While the decreased land value is calculated assuming the services provided by those lands are lost in perpetuity, the resulting estimate reflects an impact on land value that is expected to be experienced at the time the rule is made final. It is therefore an impact that is assumed to be experienced within a 23-year time frame.³⁴

2.4 INFORMATION SOURCES

73. The primary sources of information for this report are communications with, and data provided by, personnel from the Service, Federal, State, and local governments and other stakeholders. In addition, this analysis relies upon the Service's section 7 consultation records, and existing habitat management and conservation plans that consider the butterfly. Due to the high number of entities contacted, the complete list of contacted stakeholders is within the reference section at the end of this document.

³³ As described in the Proposed Rule, the Service first designated critical habitat for this species in 2002 (67 FR 18356). "Pre-designation" and "post-designation" in this report refer to the revised final critical habitat designation expected in 2008.

³⁴ The annualized value of the land values losses is the annuity value of a perpetuity, summed across the 23 year time-frame.

CHAPTER 3 | REGULATORY BASELINE

74. Since the listing of the butterfly as endangered in 1997, considerable effort has been undertaken to protect the species. This Chapter provides information about Federal, State, and local action relevant to this analysis. It presents the regulatory elements that exist in the baseline, i.e., the “without critical habitat” scenario.
75. The statutes, regulations, and other baseline elements that may affect proposed critical habitat areas for the butterfly include regulations regarding the listing of the species under the Act, the *Recovery Plan for the Quino Checkerspot Butterfly*, an Executive Order on Tribal Lands, as well as relevant California State and local statutes, regulations, and memoranda. Exhibit 3-1 shows which baseline elements apply to various proposed butterfly critical habitat units. Each element is described in more detail in the remainder of this Chapter.

EXHIBIT 3-1 RELEVANT BASELINE ELEMENTS

ELEMENT	AFFECTED UNITS									
	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 5	UNIT 6	UNIT 7	UNIT 8	UNIT 9	UNIT 10
Year 2005 Quino Checkerspot Survey Areas ¹	√	√	√	√	√	√	Partial	√	√	√
Recovery Plan	√	√	√	√	√	√	√	√	Partial	√
Overlap with Other Endangered Species	√	√	√	√	√	√	√	√	√	√
Executive Order for Tribal Lands						Partial			Partial	
California Environmental Quality Act	√	√	√	√	√	√	√	√	√	√
CALIFORNIA NATURAL COMMUNITY CONSERVATION PLAN										
• San Diego County Regional MSCP - Chula Vista Subarea Plan (2001)	-	-	-	-	-	-	-	√	-	-
• San Diego County Regional MSCP - currently being amended to include the butterfly ²	-	-	-	-	-	-	-	[√] ²	-	-
• Western Riverside County Multiple Species Habitat Conservation Plan (2004)	√	√	√	√	√	√	√	-	-	-
Notes:										
√ = Regulation applies to entire unit.										
1. According to 2005 survey data, all critical habitat units are entirely within the recommended survey area except Unit 7 which has less than 5% not in recommended survey area. (Written communication, Carlsbad Fish and Wildlife Service Field Office, July 30, 2008).										
2. The San Diego County MSCP does not currently cover the butterfly, however the County is working with the Service to amend the plan specifically to address this species.										

3.1 FEDERAL PROTECTIONS

3.1.1 QUINO CHECKERSPOT SURVEY AREAS³⁵

76. On January 16, 1997, the Service listed the butterfly as an endangered species under the Act.³⁶ Under the listing, Federal agencies must consult with the Service regarding any actions they fund, authorize, permit or carry out that may affect listed species. The listing of the butterfly is the most significant aspect of baseline protection, as it makes it illegal for any person to “take” the species without a permit from the Service.³⁷ In order to prevent take of butterflies, that year the Service began recommending that landowners conduct biological surveys of their lands before commencing new land-altering activities. To aid landowners in locating the species on their properties, the Service delineated areas where biological surveys for the butterfly are recommended (a map was first released in 1999). The survey protocol recommends that a landowner: 1) have a biologist do a site assessment to see whether butterfly habitat may be present; and 2) if habitat is present, conduct focused surveys for adult butterflies.
77. The release of the survey area map has led to several hundred surveys for the butterfly. The end result of the survey process varies, but may include the creation of a habitat conservation plan or the development of a formal consultation and associated project modifications. Exhibit 3-2 demonstrates the four most common results of the survey process as they occurred prior to the designation of critical habitat in 2002.
- The “No Habitat” scenario occurred if a site assessment found that no butterfly habitat is present. In this case, the Service did not normally recommend additional precautionary actions on the part of the landowner.
 - The “Habitat, No Butterflies” scenario occurred if a site assessment found butterfly habitat, but the adult butterfly survey found none of the insects. In this case, the Service usually did not recommend additional precautionary actions, except in cases where a butterfly had been recently sighted nearby. In that case, the landowner might have developed an HCP or, if a Federal nexus existed, a consultation may have been initiated.
 - The “Habitat, Butterflies, No Nexus” scenario occurred when a habitat assessment found habitat and the adult focused survey finds butterflies, and no Federal nexus existed. In this case, the landowner usually developed an HCP and the Service issued an incidental take permit.
 - The “Habitat, Butterflies, Nexus” scenario occurred when a habitat assessment found habitat, the adult-focused survey found butterflies, and a Federal nexus existed. In this case, the Federal Action agency entered into consultation with the

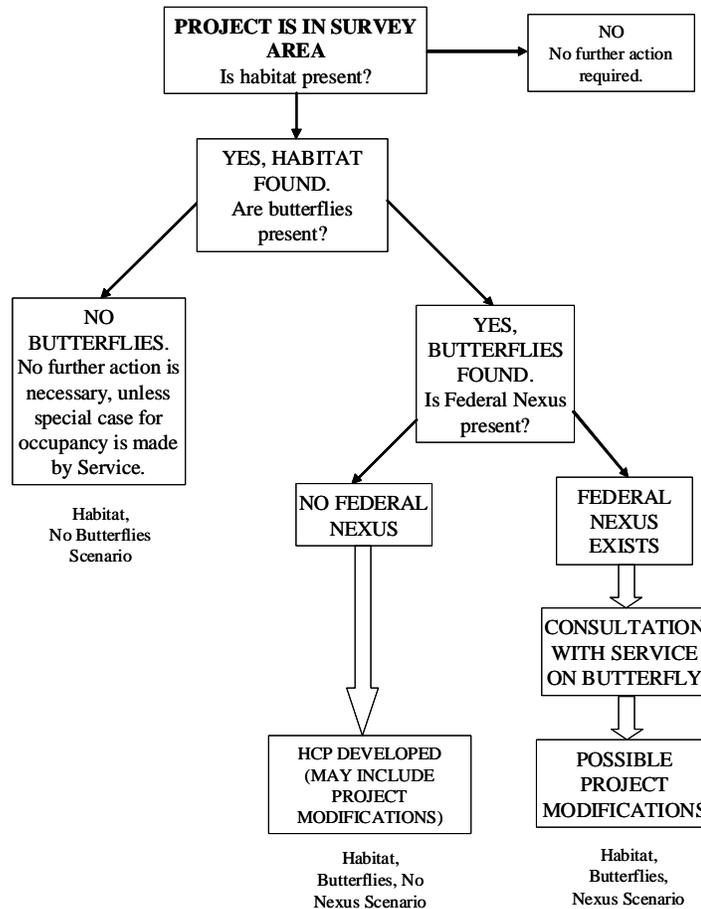
³⁵ The text from this section is taken from Industrial Economics, Incorporated, *Draft Economic Analysis of Proposed Critical Habitat Designation for the Quino Checkerspot Butterfly*, prepared for the U.S. Fish and Wildlife Service, June 2001.

³⁶ 62 FR2313.

³⁷ For the definition of “take” see Chapter 2 of this report.

Service about possible adverse effects on the butterfly. During the consultation process the Service may recommend modifying the project under consideration.

EXHIBIT 3-2 THE "WITHOUT CRITICAL HABITAT SCENARIO"



78. At the time of the 2002 critical habitat designation for the butterfly, the Service considered the proposed habitat to have the following occupancy rates based on survey results:³⁸

- Unit 1 (Lake Matthews; Riverside County) - 38 percent occupied;
- Unit 2 (Southwest Riverside Unit)– 94 percent occupied;
- Unit 3 (Otay Unit; San Diego County) – 92 percent occupied; and
- Unit 4 (Jacumba Unit; San Diego County) – 60 percent occupied.

³⁸ 59 FR 39868, as cited in Industrial Economics, Incorporated, Draft Economic Analysis of Proposed Critical Habitat Designation for the Quino Checkerspot Butterfly, prepared for the U.S. Fish and Wildlife Service, June 2001.

79. In addition, nearly all of the lands proposed to be designated as critical habitat for the butterfly in 2002 were part of the Quino Checkerspot Survey Areas created and published by the Service. Thus, biological surveys for projects were likely to have been conducted under the listing of the species under the Act in most areas proposed as critical habitat.
80. Following the 2002 critical habitat designation, additional occupancy and habitat information became available through additional survey work. Based on this information, the Service revised its identification of critical habitat for the butterfly to approximately 98,460 acres distributed across 10 proposed critical habitat units.³⁹ This analysis uses updated information about the likelihood of identifying the butterfly during a given survey from analysis of over 200 butterfly surveys performed between 2003 and 2006.⁴⁰ The details of this estimation and its implications for this analysis are presented in Chapter 4.
81. The considerable amount of surveying activity that has taken place since 1997 suggests that absent critical habitat, proponents of many land altering activities will consider impacts on butterfly habitat and modify their projects accordingly. Chapters 4 through 7 present the costs of these activities and discuss the methodology for estimating the costs of additional actions resulting from the designation of critical habitat.

3.1.2 RECOVERY PLAN⁴¹

82. Another important component of the baseline scenario is the *Recovery Plan for the Quino Checkerspot Butterfly* (Recovery Plan), proposed in 2001 and finalized in 2003.⁴² The plan includes a map delineating recovery units for the butterfly, as well as the methodology employed in determining its distribution. All of the proposed revised critical habitat units, except for a portion of Unit 9, are completely within the recovery units delineated by the Recovery Plan which has provided the public with information on the presence of the butterfly in these areas since 2001. While the Recovery Plan imposes no binding restrictions or regulatory burden on landowners and managers, it serves as an important information source for landowners regarding conservation needs for the butterfly habitat areas. Because this document is made publicly available through the publication of a Notice of Availability in the Federal Register, it may receive wider dispersal than the locally-distributed survey areas map. In addition, it publicizes detailed information about butterfly sighting locations. In conjunction with the survey areas map, the Recovery Plan provides information to the public about areas likely to be subject to

³⁹ 73 FR 3338. The Service has revised the total amount of acreage, the amount of acreage considered for exclusion, and the land ownership information for the areas proposed for critical habitat since the publication of the proposed rule. Written communication from Service Carlsbad Fish and Wildlife Office, September 22, 2008.

⁴⁰ US Fish and Wildlife Service, Memorandum: Comments on how DEA Should Estimate Incremental Costs for Quino Checkerspot Butterfly Critical Habitat Designation. Received October 24, 2008.

⁴¹ This text is excerpted from Industrial Economics, Incorporated, Draft Economic Analysis of Proposed Critical Habitat Designation for the Quino Checkerspot Butterfly, prepared for the U.S. Fish and Wildlife Service, June 2001.

⁴² U.S. Fish and Wildlife Service, *Recovery Plan for the Quino Checkerspot Butterfly*, September 17, 2003, available at http://ecos.fws.gov/docs/recovery_plan/030917.pdf.

consultation with the Service. This information was available as early as 2001, when the draft plan was available for public review.

3.1.3 OVERLAP WITH OTHER LISTED SPECIES⁴³

83. Generally, if a consultation is triggered for any listed species, the consultation process will also take into account all species known or thought to occupy areas on or near the project lands. The Service's Carlsbad Fish and Wildlife Office in Carlsbad, California has conducted formal consultations on the butterfly in combination with several species, including the federally listed California gnatcatcher, Stephens' kangaroo rat, Riverside fairy shrimp, San Diego fairy shrimp, California orcutt grass, least Bell's vireo, Munz's onion, Otay tarplant, and spreading navarretia.
84. Listing or critical habitat related protections for other threatened or endangered species may benefit the butterfly as well. For example, a substantial portion of the proposed butterfly habitat overlaps with critical habitat for the California gnatcatcher. Some of the primary constituent elements overlap for these two species, as both make use of sage scrub habitats. However, the butterfly also requires sunny, open patches that contain very specific host plant and nectar source species. This means that while consultations conducted on behalf of the gnatcatcher may provide some benefits to the butterfly, these provisions will not guarantee conservation of butterfly habitat.
85. The net effect of the presence of other federally listed species in the proposed critical habitat areas for the butterfly is that the number of uniquely butterfly consultations is likely to be smaller than would be expected in the absence of these species. Indeed, past consultations on the butterfly involve an average of just over four other species per consultation. Thus, often the cost of a consultation that involves the butterfly is not fully attributable to the presence of this species or its habitat. Nonetheless, because consultations must consider each species separately, a certain amount of research time will be spent on the butterfly regardless of the presence of other species. This analysis does not attempt to allocate administrative costs of consultations addressing multiple species across those species, rather the entire administrative costs are reported. Furthermore, while the analysis attempts to quantify only the project modifications relevant to the butterfly, these modifications may also benefit other species.

3.1.4 EXECUTIVE ORDERS ON TRIBAL LANDS⁴⁴

86. Executive Order 13175, entitled Consultation and Coordination with Indian Tribal Governments (hereafter "E.O. 13175") was signed by President Clinton on November 6, 2000. E.O. 13175 builds on the policies outlined in the Presidential Memorandum of April 29, 1994, entitled Government-to-Government Relations with Native American Tribal Governments (hereafter "Memorandum"). Both the Order and the Memorandum state that the executive departments and agencies shall work with federally recognized

⁴³ The text from this section is taken from Industrial Economics, Incorporated, *Draft Economic Analysis of Proposed Critical Habitat Designation for the Quino Checkerspot Butterfly*, prepared for the U.S. Fish and Wildlife Service, June 2001.

⁴⁴ Ibid.

Indian Tribes on a government-to-government basis. The Order enhances that discussion by stating that, for example:

- The Federal Government shall grant Tribes the maximum administrative discretion possible;
- Federal Agencies shall encourage Tribes to develop their own policies to achieve program objectives and, where possible, defer to Indian Tribes to establish standards;
- No Agency shall promulgate any regulation that has Tribal implications, that imposes substantial direct compliance costs on Indian Tribal governments, and that is not required by statute, unless 1) the funds necessary to pay the direct costs incurred by the Tribe in complying with the regulation are provided by the Federal Government, or 2) the agency a) consults with the Tribal officials early in the process of developing the regulation, b) provides a Tribal summary impact statement in the preamble of the regulation, and c) makes available to OMB any written communications submitted to the Agency by the Tribal officials;
- Agencies shall review and streamline the processes under which Tribes apply for waivers; and
- Each Agency shall designate an official with the principal responsibility for the agency's implementation of the Order.

87. A detailed discussion of impacts to Tribes is presented in Chapter 6.

3.2 STATE STATUTES AND REGULATIONS

3.2.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT⁴⁵

88. The California Environmental Quality Act (CEQA) requires identification of environmental effects of proposed projects that have the potential to harm sensitive species (state- or federally-listed). The lead agency (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. Under CEQA, surveys are conducted in order to determine the environmental effects of proposed projects on all rare, threatened and endangered species. Section 15065 of Article 5 of the CEQA 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 an Environmental Impact Report (EIR).

⁴⁵ The text from this section is taken from Industrial Economics, Incorporated, *Draft Economic Analysis of Proposed Critical Habitat Designation for the Quino Checkerspot Butterfly*, prepared for the U.S. Fish and Wildlife Service, June 2001.

89. In butterfly critical habitat areas, CEQA requirements already play a role in requiring biological surveys for the butterfly. Even absent the survey area recommendations from the Service, CEQA requirements would likely have led to biological surveys being conducted for the butterfly in many areas proposed as critical habitat. Furthermore, local regulators may request project modifications through the CEQA process that benefit the butterfly. These modifications are likely attributable to the baseline.⁴⁶

3.2.2 CALIFORNIA NATURAL COMMUNITY CONSERVATION PLANNING ACT

90. Under the California Natural Community Conservation Planning Act (NCCP) of 1991, the California Department of Fish and Game (CDFG) works with private and public partners to implement a broad-based ecosystem approach to the protection and perpetuation of biological diversity. The primary goal of this program is “to conserve natural communities and accommodate compatible land use.”⁴⁷ The program organizes five counties in southern California, including Riverside and San Diego counties, into 11 planning “subregions,” some of which are further divided into “subareas.” Each subregion and subarea must design its own habitat conservation plan for endangered species, which is submitted to the Service. If approved, these plans allow local communities to manage endangered species on specified reserve areas without having to seek additional section 10 take permits from the Service. The intention is to streamline the administrative efforts of affected parties and to provide a higher degree of regulatory certainty.
91. The initial effort under the NCCP focused on coastal sage scrub found primarily in Orange, San Diego, and Riverside counties and to a lesser extent in Los Angeles and San Bernardino counties. Two sub-regional plans are relevant to this analysis, the Western Riverside County Multi-Species Habitat Conservation Plan (MSHCP) and the San Diego Multiple Species Conservation Program (MSCP). Under the San Diego County MSCP, the Chula Vista Subarea Plan provides protection to the butterfly in parts of the proposed critical habitat. An amendment to the San Diego County MSCP is under development to provide coverage for the butterfly in other areas, including proposed Unit 8 (Otay). These plans are discussed in detail below.

Western Riverside County Multiple Species Conservation Plan

92. Completed in 2003, the Western Riverside MSHCP is “a comprehensive, multi-jurisdictional HCP focusing on conservation of species and their associated habitats in Western Riverside County.”⁴⁸ It serves as an HCP pursuant to Section 10(a)(1)(B) of the Act, authorizing the “take” of plant and wildlife species by participating entities within

⁴⁶ Note that in certain cases, the information provided by the designation of critical habitat may alert local and State regulators to the presence of sensitive habitat, triggering or requiring more action through the CEQA process than in the absence of the critical habitat maps. This situation is unlikely in the context of the butterfly given the long-term availability of the survey area maps and Recovery Plan.

⁴⁷ California Department of Fish and Game, Habitat Conservation Branch, “Natural Community Conservation Planning (NCCP),” as viewed at www.dfg.ca.gov/habcon/nccp/index.html on June 6, 2008.

⁴⁸ Western Riverside County MSHCP. Available at: <http://www.rctlma.org/mshcp/index.html>

the identified the Plan Area. The plan currently protects 146 species and the wide diversity of habitats occupied by these species.

93. The Western Riverside MSHCP is administered by the Western Riverside County Regional Conservation Authority through a Joint Powers Authority consisting of 14 cities and the county.⁴⁹ “The MSHCP Plan Area encompasses approximately 1.26 million acres (1,966 square miles); it includes all unincorporated Riverside County land west of the crest of the San Jacinto Mountains to the Orange County line, as well as the jurisdictional areas of the Cities of Temecula, Murrieta, Lake Elsinore, Canyon Lake, Norco, Corona, Riverside, Moreno Valley, Banning, Beaumont, Calimesa, Perris, Hemet, and San Jacinto.”⁵⁰ Activities covered by this MSHCP include:
- Public and private development (including single family homes on existing parcels);
 - Development and maintenance of existing and planned roads;
 - Operation of State park facilities;
 - Operation of flood control facilities; and
 - Operation of waste management facilities.
94. The MSHCP is broken down into 16 “areas,” each of which has an Area Plan that specifies acreage to be preserved, applicable core and linkage habitats, and biological considerations, including a list of species considered during the planning process. In addition, each Area Plan specifies subunits which have conservation criteria attached to them which explain the relationship of the subunit to the area in terms of habitat conservation.⁵¹
95. For the butterfly, the MSHCP is designed to include “at least 67,493 acres of Core Area including suitable Conserved Habitat mosaic within seven Core Areas and an additional 12 satellite locations.”⁵² The Service is considering exclusion of 33,717 acres of non-Federal lands in the MSHCP area because “habitat conservation goals, avoidance and minimization measures, and adaptive management program for the butterfly (and its PCEs)...may exceed any conservation value provided as a result of regulatory protections...afforded through critical habitat designation.”⁵³ Lands not being considered for exclusion include those managed by federal agencies (BLM, Cleveland National Forest, and San Bernardino National Forest) and the Cahuilla Band of Indians.⁵⁴ The MSHCP achieves its conservation goals through several means including land acquisition, local development processes, and mitigation; these actions will be discussed

⁴⁹ Western Riverside County Conservation Authority website: <http://www.wrc-rca.org/>

⁵⁰ Western Riverside County MSHCP. Available at: <http://www.rctlma.org/mshcp/index.html>

⁵¹ Section 3.3, Western Riverside County MSHCP. Available at: <http://www.rctlma.org/mshcp/index.html>

⁵² Core areas are defined as, “A block of Habitat of appropriate size, configuration, and vegetation characteristics to generally support the life history requirements of one or more Covered Species.” (Section 3.2.3 of the Western Riverside MSHCP).

⁵³ 73 FR 3351.

⁵⁴ Ibid.

in detail in Chapters 4 and 5, which pertain to development impacts. The costs for habitat and plan management are presented in Chapter 7.

San Diego County Multiple Species Conservation Program

96. In southwestern San Diego County, “the MSCP Sub-Regional Plan addresses the potential impacts of urban growth, natural habitat loss and species endangerment, and creates a plan to mitigate for the potential loss of ‘covered species’ and their habitat due to the direct, indirect and cumulative impacts of future development of both public and private lands within the MSCP’s approximately 900-square mile study area.”⁵⁵ The plan was adopted by the County and City of San Diego in 1997. The plan covers 85 sensitive, rare, threatened and endangered plant and animal species. Currently, the plan does not include the butterfly. It is anticipated that 12 jurisdictions will ultimately participate in the MSCP program. Each jurisdiction would be charged with preparing and implementing subarea plans under the MSCP framework that meet the requirements of section 10(a)(1)(B) and are consistent with the aims of the MSCP. The Service consults on all subarea plans under section 7 of the Act to ensure their consistency with the aims of the MSCP.⁵⁶
97. The butterfly is not currently a covered species under this plan. However, certain subareas, such as the City of Chula Vista, have already included the butterfly in their more recent subarea plans. In addition, efforts have been underway to add the butterfly to the San Diego County MSCP since before the publication of the proposed rule for the original critical habitat designation in 2001.⁵⁷ Therefore, measures undertaken as part of the plan to protect the butterfly are likely to occur in the absence of designated critical habitat.

Chula Vista Subarea Plan (2003)

98. The City of Chula Vista approved its subarea plan in 2003. “The City’s MSCP Subarea Plan provides a blueprint for habitat preservation and forms the basis for federal and state incidental “Take” permits for 86 plant and animal species within the City. The incidental take permits are issued by the United States Fish and Wildlife Service and the California Department of Fish and Game, also referred to as the ‘Wildlife Agencies.’”⁵⁸ An important goal of this plan is to provide a “Quino checkerspot butterfly Recovery Component sufficient to warrant coverage for the species and making it the ‘86th’ covered species under the City’s requested incidental take permit.” An Implementing Agreement (IA) was also signed by the Wildlife Agencies in order to ensure implementation of the Chula Vista Subarea Plan. The Chula Vista Subarea Plan impacts from land acquisition,

⁵⁵City of Chula Vista. Multi-Species Conservation Plan (MSCP). Summary available at http://www.chulavistaca.gov/City_Services/Development_Services/Planning_Building/Planning/Enviromental/Habitat.asp

⁵⁶ 73 FR 3351.

⁵⁷ Industrial Economics, Incorporated, *Draft Economic Analysis of Proposed Critical Habitat Designation for the Quino Checkerspot Butterfly*, prepared for the U.S. Fish and Wildlife Service, June 2001, p. 16.

⁵⁸ City of Chula Vista. Multi-Species Conservation Plan (MSCP). Summary available at http://www.chulavistaca.gov/City_Services/Development_Services/Planning_Building/Planning/Enviromental/Habitat.asp.

mitigation, and land use regulations are addressed in Chapters 4 and 5. Species and habitat management impacts are addressed in Chapter 7.

San Diego County MSCP - Quino Amendment

99. The San Diego County MSCP was completed in 1997, prior to the listing of the butterfly and therefore does not currently afford protection for this species. The County of San Diego is working to gain coverage for the butterfly under the plan through an amendment. The butterfly will be the eighty-sixth species to be covered by the plan.⁵⁹ The County anticipates submitting the Amendment to the Service for approval in 2010.
100. The goal of the amendment is to provide for the conservation and recovery of the butterfly and its habitat while simultaneously facilitating a streamlined development regulatory process. It will establish a preserve area that will be conserved for the benefit of the butterfly. Additionally, it will ensure funding for an adaptive management framework and monitoring of the species and key habitat constituents to provide for long-term management for the butterfly.⁶⁰
101. Although the location of the preserve areas are not yet publicly available, the draft amendment states that complete conservation will be required in certain areas within existing subarea plan preserves and certain lands in the Alpine-Jamul area. The draft amendment states a preference for conserving occupied habitat within the same butterfly management area. Expected requirements relating to development are discussed in detail in Chapters 4 and 5.⁶¹ Because the efforts to include the butterfly in the plan began prior to 2001, impacts related to the plan are attributed to the baseline.

⁵⁹ San Diego County website, available at <http://www.sdcounty.ca.gov/dplu/mscp/quino.html>, accessed on June 6, 2008.

⁶⁰ Ibid.

⁶¹ County of San Diego Multiple Species Conservation Program Quino Checkerspot Butterfly Amendment, available at http://www.sdcounty.ca.gov/dplu/mscp/docs/Quino/Quino_Paper1_Mar2008.pdf Accessed on June 12, 2008

CHAPTER 4 | POTENTIAL ECONOMIC IMPACTS TO RESIDENTIAL DEVELOPMENT

102. Residential development may result in the loss and fragmentation of butterfly habitat and may disrupt landscape connectivity. This Chapter first reviews past impacts to development projects in the study area. Next, the Chapter summarizes the methodological steps necessary to estimate future development impacts. The Chapter then applies these steps, and baseline and incremental post-designation impacts are reported separately. The Chapter concludes with a discussion of the sources of uncertainty in this analysis.
- 4.1 PRE-DESIGNATION IMPACTS⁶²**
103. This section reviews the pre-designation impacts to development projects. Exhibit 4-1 presents a summary of formal section 7 consultations undertaken by the Service for development projects located within the study area. These consultations all concern residential projects, except for The Nature Conservancy's (TNC) consultation, which addressed land conservation. The latter consultation is included in this discussion because The Nature Conservancy's goal was to protect the land from future development.
104. Exhibit 4-1 provides details of development projects completed under the framework of the HCPs. The projects by Four Public and Nine Private Agencies and by Pacific Bay Properties, LLC were conducted under the MSHCP. The Otay Ranch Company plan coincided with the development of the Chula Vista Subarea Plan. In order to avoid double-counting, no pre-designation development costs are attributed specifically to either plan. Pre-designation habitat conservation costs for the HCPs are included in Chapter 7.
105. The conservation efforts arising from these consultations included employing biological monitors, purchasing or designating offsetting land set-asides, or purchasing conservation offsets in land conservation banks. The total present value of pre-designation impacts resulting from formal section 7 consultations are estimated to be \$66.4 million for areas considered for exclusion and \$202 million for areas not considered for exclusion, assuming a seven percent discount rate.

⁶² As discussed in Section 2, "pre-designation" refers to the time period prior to the finalization of this proposed rule and includes impacts occurring in 1997 through 2007.

EXHIBIT 4-1 SUMMARY OF DEVELOPMENT PROJECTS AND ECONOMIC IMPACTS DURING PRE-DESIGNATION PERIOD
(1997-2007, 2008 DOLLARS)

YEAR	ENTITY	UNIT	PROJECT SUMMARY	PRESENT VALUE ECONOMIC IMPACTS (SEVEN PERCENT DISCOUNT RATE)
2000	Four Public and Nine Private Agencies	1 Warm Springs and 2 Skinner/ Johnson	Four public agencies and nine private entities (collectively the Agencies) requested incidental take for 14 covered projects that could have resulted in take of listed species despite the avoidance and minimization measures incorporated based on the MSHCP. The project applicants proposed to mitigate for project impacts by conserving approximately 1,056 acres of habitat for the butterfly (880 acres in the Skinner-Johnson metapopulation and 176 acres in the Warm Springs metapopulation). ²	\$55.4 million in areas considered for exclusion
2000- 2004	Pacific Bay Properties LLC	2 Skinner/ Johnson	Rancho Bella Vista Project. Pacific Bay Properties LLC (Pacific Bay) developed the Rancho Bella Vista project site within the area currently covered by the Western Riverside County Multiple Species Habitat Conservation Plan. The 798-acre project includes 1,998 single-family residences, an elementary school, a middle school, two active parks, a passive park, and 300 acres of open space. Pacific Bay consulted with the Service on the effects of the project to the butterfly and other listed species in 2000. The project site is surrounded on three sides by butterfly populations and affected 97.8 acres of habitat that could be used for butterfly breeding, nectaring and dispersal. To compensate for impacts to the butterfly, Pacific Bay enhanced approximately five acres of grassland. Pacific Bay created a habitat enhancement program for the butterfly consisting of three phases: non-native grass and thatch removal, seeding, and a two year monitoring / maintenance program. ¹	\$1.53 million in areas considered for exclusion
2002, 2004 & 2007	Otay Ranch Company	8 Otay	Otay Ranch General Development Plan. Otay Ranch is located partly in the City of Chula Vista and in an unincorporated area of San Diego County. It is a planned community with housing, shops, workplaces, schools, parks, civic facilities and open spaces. It is intended to cluster the majority of development in villages and have defined open spaces and wildlife corridors. In 1993, the City of Chula Vista and the San Diego County Board of Supervisors jointly adopted the Otay Ranch General Development Plan / Sub-regional Plan (Plan) for the master planned community of Otay Ranch. Acquisition of land was assured under the Plan which also outlined compensation at a 1.18 to 1 ratio for development of the Otay Ranch, totaling about 11,375 acres of preserve land located in the County unincorporated area. An additional approximately 2,000 acres within the ranch are designated as limited development. ⁴ <ul style="list-style-type: none"> • In 2002, Otay Ranch Company undertook consultation with the Service on its Drainage Facilities Project in 2002. Due to the project, an unquantifiable (but small) number of the butterfly were likely to be affected by permanent impacts to 11.6 acres. Temporary impacts were anticipated to involve 17.8 acres of designated critical habitat. To off-set 	\$9.5 million in areas considered for exclusion \$199 million in areas not considered for exclusion

YEAR	ENTITY	UNIT	PROJECT SUMMARY	PRESENT VALUE ECONOMIC IMPACTS (SEVEN PERCENT DISCOUNT RATE)
			<p>impacts, the Service recommended effects to critical habitat be compensated at a 2:1 replacement ratio for coastal sage scrub (CSS) and 1:1 for non-native grassland.⁵</p> <ul style="list-style-type: none"> ● In 2004, Otay Ranch Company purchased land for the preserve in 2004 at a cost of approximately \$13,500 per acre. It funds the management and maintenance of the preserve lands through a Community Facility District (CFD), which generates approximately \$140 per acre of preserve land. This is essentially an annual tax on homeowners for management of the preserve.⁶ 	
2007	The Nature Conservancy	10 Jacumba	In 2007, TNC purchased approximately 1,080 acres in proposed Unit 10 at \$2,100 per acre, which it intends to sell to California State Parks and Recreation. TNC does not actively manage the property. TNC purchased the land to protect it from being developed. ⁸	\$2.43 million in areas not considered for exclusion
<p>Notes:</p> <p>The total economic impacts of pre-designation conservation measures associated with residential development is \$268 million, discounted at seven percent. Impacts for areas being considered for exclusion total \$66.4 million (discounted at seven percent) and impacts for areas not considered for exclusion total \$202 million (discounted at seven percent).</p> <p>* In addition to the consultations noted above, in 2004 the Service participated in a section 7 consultation with the Lake Elsinore Unified School District on School Site 15, which is located outside of the study area. As a result of the consultation, the District purchased 28.5 acres of coastal sage scrub at the Wilson Creek / Joe Gonzales conservation bank located in Unit 1 (on land considered for exclusion). Because the cost of purchasing these acres is associated with a project outside of the study area, the sum is not counted in this analysis.</p> <p>References:</p> <p>¹ US Fish and Wildlife Service. Formal Section 7 Consultation Conference for Issuance of a Section 10(a)(1)(B) Permit to Pacific Bay Properties, Rancho Bella Vista, Western Riverside County (1-6-00-FW-12), April 24, 2000.</p> <p>² US Fish and Wildlife Service. Intra-Service Formal Section 7 Consultation/Conference on the Issuance of a Section 10(a)(1)(B) Permit to Four Public Agencies and Nine Private Entities for the Assessment District 161 Subregional Habitat Conservation Plan, Western Riverside County (1-6-01-F-725.2), December 04, 2000.</p> <p>³ US Fish and Wildlife Service. Formal Section 7 Consultation (FWS-WRIV-3610.3) for the Lake Elsinore Unified School District, School Site 15, Riverside County, California, February 25, 2004.</p> <p>⁴ Personal communication with Kim KilKenny, Executive Vice President of Otay Ranch Company, on May 8, 2008.</p> <p>⁵ US Fish and Wildlife Service. Biological and Conference Opinion for the Eastern Otay Ranch Drainage Facilities, City of Chula Vista, San Diego County, California (1-6-02-F-3004.2; Corps File No. 200200124-TCD), 2002.</p> <p>⁶ Personal communication with Kim KilKenny, Executive Vice President of Otay Ranch Company, on May 13, 2008.</p> <p>⁷ US Fish and Wildlife Service. Formal Consultation and Conference for the Rolling Hills Ranch Subarea III (Eastern Portion) Project, Chula Vista, San Diego County, California; Corps # 200200601-RJL (1-6-02-F-1071.4), 2002.</p> <p>⁸ Electronic communication with David Van Cleve, TNC South Coast Eco Regional Director, on May 14, 2008.</p>				

4.2 METHODOLOGY FOR ESTIMATING POST-DESIGNATION IMPACTS

106. This section provides an overview of the steps necessary to identify and estimate future impacts to residential development projects in the study area. Sections 4.3 through 4.8 describe the steps in more detail. These steps are illustrated in Exhibit 4-2, which shows the logic used to identify incremental impacts separately from costs likely to occur even in the absence of critical habitat.

- **Step 1 - Forecast future development activity within the study area.** The analysis combines forecasts of growth in population and new home construction provided by local planning authorities with a spatial model predicting the likely physical location of future development to predict the number of acres within the study area likely to be developed by 2030.
- **Step 2 - Determine whether projected development is within the bounds of an existing or proposed habitat conservation plan .** As described in Chapter 3, two existing HCPs, the Western Riverside MSHCP and the Chula Vista Subarea Plan of the San Diego County MSCP dictate conservation measures for the butterfly within acres considered for exclusion in Units 1 through 7 and Unit 8, respectively. Furthermore, a proposed amendment to San Diego County MSCP will protect the butterfly and its habitat in areas of Unit 8 that are not under consideration for exclusion. In all three areas, these protections are unlikely to be affected by the designation of critical habitat, therefore costs associated with implementing them are attributed to the baseline. To estimate these impacts, go to Step 5. For areas not covered by these HCPs, go to Step 3.
- **Step 3 - Determine the likelihood that butterflies will be detected during site surveys.** As described in Chapter 3, since 1997, the Service has recommended that landowners conduct biological surveys for the butterfly prior to commencing land-altering activities. More than 200 butterfly surveys from 2003 to 2006 were analyzed to quantify the likelihood, in percentage terms, of finding the butterfly. These percentages are used to help determine whether project proponents would have undertaken actions to protect butterfly habitat absent critical habitat designation.
- **Step 4 - Determine whether a Federal nexus is present.** This analysis relies on assumptions made in the 2001 “Draft Economic Analysis of Proposed Critical Habitat Designation for the Quino Checkerspot Butterfly” (hereafter “2001 DEA”) about the likelihood of a Federal nexus for future development projects in areas not covered by an HCP (or pending HCP coverage).⁶³
- **Step 5 - Distinguish between actions resulting from baseline regulations and the proposed critical habitat rule.** In areas outside of existing HCPs, baseline impacts occur where the butterflies are identified during surveys and there is a Federal nexus (e.g., a permit is required from the U.S. Army Corps of Engineers

⁶³ Industrial Economics, Incorporated, “Draft Economic Analysis of Critical Habitat Designation for the Quino Checkerspot Butterfly,” prepared for the U.S. Fish and Wildlife Service, June 2001.

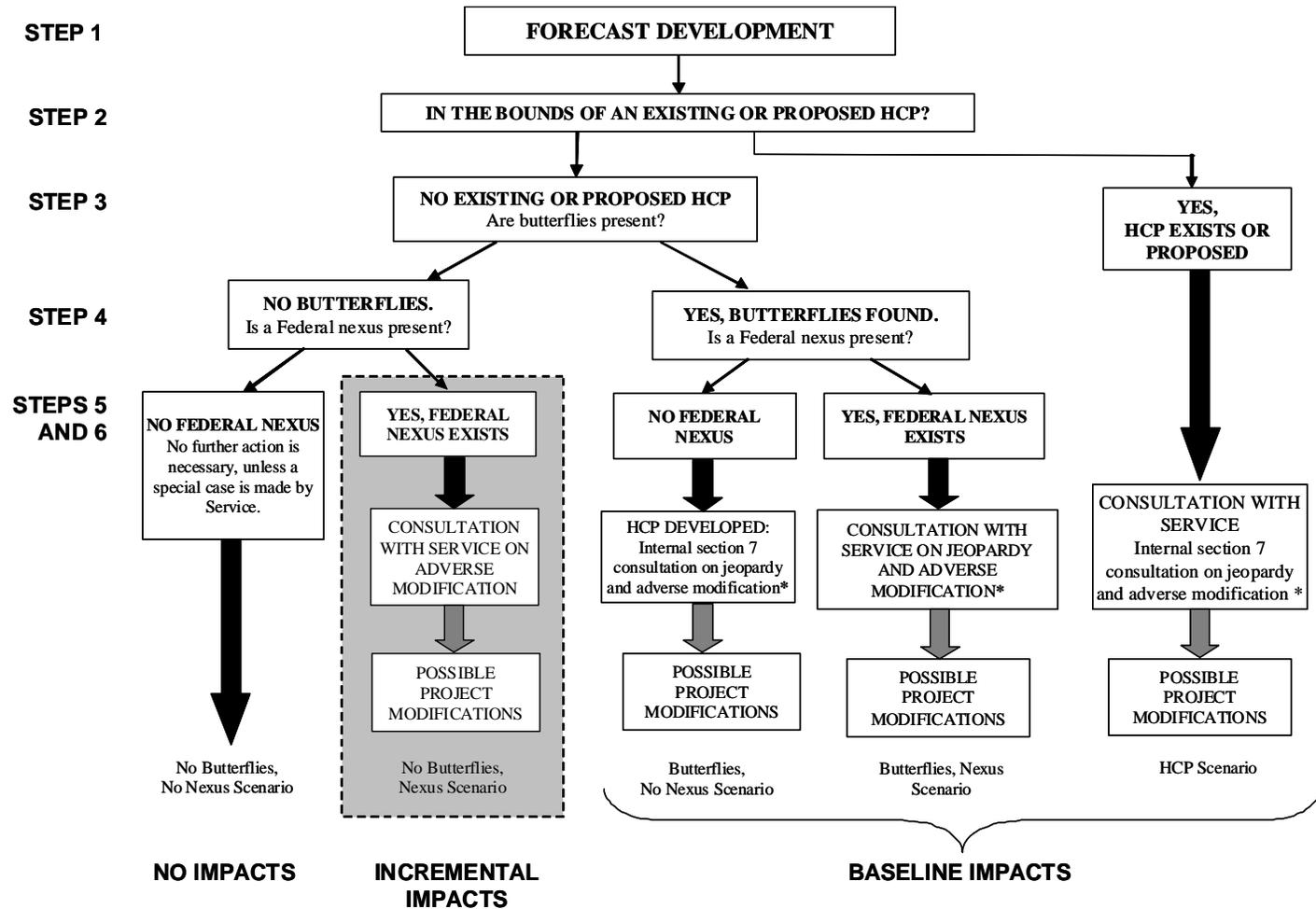
to fill wetlands).⁶⁴ Baseline impacts also include the implementation of HCPs. Incremental impacts occur in areas outside of existing or proposed HCPs, where a survey does not identify the presence of the butterfly and the project has a Federal nexus. When no Federal nexus is present, and the butterfly is not identified, no impacts are anticipated.⁶⁵

- **Step 6 - Estimate impacts.** Three types of impacts are estimated. The administrative costs of participating in consultations are calculated based on assumptions from the original DEA regarding average project size (in acres) and the consultation cost model presented in Chapter 2. Project modifications are estimated by applying typical compensation ratios derived from the section 7 consultation history or the measures dictated by existing HCPs and proposed amendments. Finally, project delays associated with the section 7 consultation process are estimated based on the carrying costs of owning the undeveloped acres during the time period required to complete the consultation process. Note that in this final step, the analysis also includes estimates of the cost to BLM to consult with the Service on the butterfly as it constructs fire breaks on its lands abutting future residential development. These costs are included in this Chapter because they depend upon projections of development activity developed in Step 1.

⁶⁴ Note that in such cases, minor incremental administrative costs will be incurred to include consideration of adverse modification in the consultation.

⁶⁵ As shown in Exhibit 4-2, theoretically, in areas outside the bounds of existing or planned HCPs, where the butterfly is detected in surveys but no Federal nexus is present, a developer should develop a site specific HCP to avoid potentially violating section 9 of the Act. However, these costs are not quantified in the analysis. The development of an HCP is a voluntary process making it difficult to predict how likely a developer is to take this step. Furthermore, as discussed in detail later in this chapter, this branch of the decision tree only applies to Units 9 and 10, and the high-end cost scenario assumes that 80 percent of projects have a nexus. As a result, this analysis may understate baseline impacts for a relatively small portion of the study area. The incremental administrative costs associated with these acres is likely to be negligible.

EXHIBIT 4-2 STEPS USED TO IDENTIFY AND SEPARATE BASELINE AND INCREMENTAL IMPACTS



* Minor administrative costs of adding adverse modification text to consultation are counted as incremental impacts.

4.3 STEP ONE: FORECAST FUTURE DEVELOPMENT WITHIN THE STUDY AREA

107. The identification of potentially affected developable land relies on two pieces of information: (1) projections of the amount of development forecast to occur over the next 23 years; and (2) information about the geographic location of anticipated development. Specifically, two regional planning authorities provide estimates of the number of housing units projected to be built by 2030 in the census tracts encompassing the study area. The San Diego Association of Governments (SANDAG) provides estimates for census tracts in San Diego County, and the Southern California Association of Governments (SCAG) provides estimates for census tracts in Riverside County.
108. Because in most cases the proposed critical habitat units are smaller than census tracts, the location of future development within the tracts is important. To allocate SANDAG and SCAG's projections spatially within the tracts, the analysis relies on a statistically-based growth allocation model developed by Berkeley Economic Consulting. Their model incorporates demand variables (e.g., job accessibility and income level), location-specific variables (e.g., freeway proximity); current land-use classifications (e.g., farmland, flood plains); neighborhood variables (e.g., the location of nearest neighbors); and regulatory variables (e.g., incorporated boundaries of cities) to identify the probability that each hectare of land in the State of California will be developed by 2030. A detailed explanation of the application of BEC's model is presented in Appendix E.
109. Exhibit 4-3 displays the projected number of housing units and acres of development for Units 1-7, 9-10, and the census tracts in Unit 8.⁶⁶ The number of housing units is projected by SANDAG and SCAG and allocated to critical habitat units as described in the previous paragraph. The projected acreage supporting this development is calculated based on the typical acreage per house, derived from median lot-size data for the study area obtained from DataQuick Information Systems.⁶⁷

⁶⁶ All private lands in the areas of Units 1-7 that are proposed for designation are considered for exclusion.

⁶⁷ Land set asides, such as the land purchased by TNC for conservation or the set asides in the Otay Ranch Development (Section 3.1), have been removed from the total of forecast development reported in Exhibit 3-3. Inclusion of the development potential of these conservation lands would be double-counting; the costs associated with conserving these acres approximates the opportunity costs of development.

EXHIBIT 4-3 FORECAST DEVELOPMENT IN CRITICAL HABITAT UNITS

UNIT	UNIT NAME	CENSUS TRACT (2000)	FUTURE PROJECTED HOUSING UNITS (2008 - 2030)	FUTURE PROJECTED ACRES DEVELOPED (2008 - 2030)
8	Otay	06073010014	182	833
		06073010015	379	71
		06073013313	0	0
		06073021100	6	67
		06073021302	573	6,781
		06073021303	41	97
		06073021304	117	204
9	La Costa / Campo ²		80	893
10	Jacumba		75	838
Subtotal ¹			1,453	9,784
CONSIDERED FOR EXCLUSION				
1	Warm Springs		615	157
2	Skinner/Johnson		49	13
3	Sage		16	29
4	Wilson Valley		84	325
5	Vail Lake/Oak Mountain		41	10
6	Tule Peak		49	256
7	Bautista		89	360
8	Otay	06073010014	15	69
		06073013313	454	3,449
		06073021302	0	0
Subtotal ¹			1,412	4,669
TOTAL			2,865	14,453
Notes: (1) Totals may not sum due to rounding (2) Development forecasts for the Campo Band of the Kumeyaay Indians are presented in Chapter 6.				

4.4 STEP 2: WITHIN THE BOUNDS OF AN EXISTING OR PROPOSED HCP?

110. As discussed in Chapter 1, acres considered for exclusion within proposed Units 1 through 7 are covered by the Western Riverside MSHCP. In addition, the acres considered for exclusion in Unit 8 are covered by the Chula Vista Subarea Plan. Therefore, 4,669 acres of future development shown in Exhibit 4-3 are subject to the requirements of these plans. The impacts of these plans are estimated in Step 6 below.
111. In addition, all 8,053 acres of projected development in the areas of Unit 8 that are not considered for exclusion will also be covered by the proposed Quino Amendment to the San Diego County MSCP. As discussed in Chapter 3, because the development of this

amendment began prior to the proposed designation of critical habitat in 2001, the analysis assumes that finalization of the current designation is unlikely to alter the plan. Therefore, impacts associated with implementation of the plan are attributed to the baseline regulatory environment.

112. The remaining 1,731 acres of projected development on private lands in proposed Units 9 and 10 are not subject to an existing or proposed HCP. Therefore, impacts associated with development in these areas are assessed following the remaining steps outlined below.

4.5 STEP 3: IDENTIFY LIKELIHOOD THAT BUTTERFLY WILL BE IDENTIFIED ON THE PROJECT SITE

113. The proposed critical habitat units for the butterfly were determined based on core occurrence complexes for the subspecies. As described in the proposed rule, all of the proposed units are occupied. However, adult butterfly densities and movement within a population distribution varies annually at any given location due to multiple variables affecting butterfly presence, such as drought, weather conditions, and available plant resources. As a result, it is possible that when a project proponent surveys a project site looking for the butterfly, occupancy may not be detected even within currently occupied habitat.⁶⁸
114. Determination of the future likelihood that the butterfly will be detected within the proposed critical habitat is based on the results of historical surveys. This analysis analyzed the findings of more than 200 surveys undertaken across all 10 units between 2003 and 2006. These surveys included occupancy surveys conducted by the Service, usually in the context of development of some parcel of land, as well as monitoring surveys, carried out by various different organizations to ascertain whether the butterfly was present. Both sources of information were used to generate estimates of the likelihood of finding the butterfly in a given acre of proposed critical habitat, consistent with guidance by the Service.⁶⁹
115. In Unit 9, the analysis assumes that the butterfly will be detected 44 percent to 59 percent of the time. The low estimate is based on a simple percentage of the number of surveys conducted in Unit 9 that positively detected the species compared with the total number of surveys conducted in the unit. The high end of the range is based on a smaller subset of the surveys and compares the total acreage of surveys with positive detections to the total acreage of all surveys in the unit. Any surveys that do not report acreages are excluded from the latter calculation. In Unit 10, the probability of detection ranges from zero percent to 25 percent. In this case, no surveys reporting acreage were conducted in

⁶⁸ US Fish and Wildlife Service, Memorandum: Comments on how DEA Should Estimate Incremental Costs for Quino Checkerspot Butterfly Critical Habitat Designation. Received October 24, 2008.

⁶⁹ US Fish and Wildlife Service, Memorandum: Comments on how DEA Should Estimate Incremental Costs for Quino Checkerspot Butterfly Critical Habitat Designation. Received October 24, 2008.

the unit, resulting in the lower end of the range. A few monitoring surveys in that unit detected the butterfly, resulting in the higher detection rate.

116. In Units 9 and 10, for projects where the butterfly is not detected and a nexus is present (see Step 4), administrative and project modification costs are considered to result incrementally from the designation; they would not have occurred had critical habitat not been designated. Impacts to projects where the butterfly is detected are not incremental; these costs are part of the baseline and would be incurred out regardless of critical habitat designation.

4.6 STEP 4: IDENTIFY FEDERAL NEXUS

117. The 2001 DEA assumed that a Federal nexus would be present for 20 percent to 80 percent of projects.⁷⁰ Because this is the best data available, this analysis applies the same assumption. The number of acres projected for development in Units 9 and 10 are multiplied by 20 percent to obtain a low estimate of impacts and 80 percent to obtain a high estimate of impacts. Exhibit 4-4 presents the forecast acreage that will be subject to consultation for the low and high scenarios.

EXHIBIT 4-4 FORECAST ACREAGE REQUIRING DEVELOPMENT OFFSETS

UNIT	CENSUS TRACT	ACREAGE WITH NEXUS: LOW ESTIMATE	ACREAGE WITH NEXUS: HIGH ESTIMATE
9		178.7	714.7
10		167.5	670.1

4.7 STEP 5: DISTINGUISH BETWEEN BASELINE AND INCREMENTAL IMPACTS

118. The preceding steps provide the information necessary to distinguish between baseline and incremental impacts. Activities in areas where the butterfly is likely to be found and subject to a Federal nexus are likely to incur administrative consultation costs and may be subject to project modifications. Most of the costs would be incurred absent critical habitat based on the protection provided by the listing and the widespread knowledge of the potential presence of the species, described in Chapter 3.
119. For proposed critical habitat where the butterfly is detected and that has a Federal nexus, a formal consultation is likely. Part of this consultation will address jeopardy of the species and part will address adverse modification of the habitat. Most of the administrative costs of the consultation will be incurred regardless of whether critical habitat is designated and therefore are attributed to the baseline; minor costs associated with adding consideration of adverse modification to the written text are considered to be incremental to the rule (see Exhibit 2-2 in Chapter 2). At this time, no new or different

⁷⁰ Industrial Economics, Incorporated, "Draft Economic Analysis of Proposed Critical Habitat Designation for the Quino Checkerspot Butterfly," prepared for the U.S. Fish and Wildlife Service, June 2001.

project modifications are forecast to result from future consultations.⁷¹ As a result, expected project modifications from forecast consultations are attributed entirely to the baseline.

120. For the proposed critical habitat overlapping an existing or planned HCP, the Service may undertake internal consultations to affirm that the actions agreed to in the plan will not jeopardize the species or adversely modify critical habitat. However, significant uncertainty exists regarding whether the Service will undertake such activity, and the associated administrative costs are likely to be small. As a result, these costs are not estimated. However, project delays are expected to occur as HCP stakeholders confirm that development will be consistent with the HCP rules.⁷² The cost of these delays, as well as project modification costs dictated by the HCPs, are estimated and attributed to the baseline.
121. Incremental impacts may arise from actions in areas outside of current or planned HCPs where the butterfly is unlikely to be detected (as revealed by the surveys), but where a Federal nexus is present (20 percent to 80 percent of the time). As shown in Figure 3-2 of Chapter 3, absent critical habitat, explicit protection of butterfly habitat would not be anticipated in these situations. However, the designation compels Federal action agencies to consider the potential for land-altering activities to adversely modify critical habitat, even when the butterfly is not present. For these areas, the administrative costs of consultation and resulting project modifications are attributable to the proposed rule.

4.8 STEP 6: ESTIMATE IMPACTS

122. The final step estimates the baseline and incremental impacts likely to be incurred as a result of residential development projects. This estimation involves the calculation of direct development impacts based on administrative consultation costs and on potential project modifications. This step also includes the calculation of the cost of development delays. Finally, the analysis estimates the costs to BLM of constructing fire breaks on its lands that are forecast to abut future development.

4.8.1 ADMINISTRATIVE COSTS OF CONSULTATIONS

123. The number of forecast consultations is based on the number of expected development projects that have a Federal nexus. The number of development projects is estimated by dividing the total forecast development acreage affected under each scenario by the average size of a development project.⁷³ The 2001 DEA assumes that the average size of

⁷¹ US Fish and Wildlife Service, Memorandum: Comments on how DEA Should Estimate Incremental Costs for Quino Checkerspot Butterfly Critical Habitat Designation. Received October 24, 2008.

⁷² Within the Western Riverside County MSHCP, project delays to coordinate with HCP requirements may take up to 1.5 months. See Riverside County Environmental Programs Department web-site: <http://www.rctlma.org/epd/erpqa.html> Accessed on September 10, 2008. Comparable delay costs are assumed to occur within the area covered by the proposed Quino Amendment to the San Diego County MSCP.

⁷³ The scenarios are the low and high estimates of acres affected by baseline regulations and the low and high estimates of acres affected incrementally by critical habitat designation.

a project in these areas ranges from 75 acres (high impact scenario) to 100 acres (low impact scenario).⁷⁴

124. The number of forecast consultations is equal to the acreage of forecast development, divided by the average expected development size, then multiplied by the probability of a Federal nexus. For the low impact scenario, this is the forecast development acreage divided by 100 acres, then multiplied by 20 percent. For the high impact scenario, this is the forecast development acreage divided by 75 acres, then multiplied by 80 percent. Exhibit 4-5 presents the range of the number of forecast consultations, assuming one consultation per project. Exhibit 4-5 forecasts consultation for Units 9 and 10 only. Consultation is not required for development within an HCP and HCPs cover (or are forecast to cover) all of the other units within the study area.
125. Impacts are reported as baseline or incremental based on the majority of the cost of consultation. That is, if a consultation is developed in occupied habitat, where the majority of the consultation is baseline, Exhibit 4-5 displays a predicted baseline consultation (even though part of that consultation's impact will be included in the incremental impact totals).⁷⁵ If a consultation is conducted in an area outside of an existing or planned HCP and where the butterfly is not detected, the consultation is reported as incremental in Exhibit 4-5.

**EXHIBIT 4-5 FORECAST NUMBER OF BASELINE AND INCREMENTAL CONSULTATIONS
(2008 - 2030)**

UNIT	UNIT NAME	CENSUS TRACT (2000)	BASELINE FORECAST CONSULTATIONS LOW SCENARIO	BASELINE FORECAST CONSULTATIONS HIGH SCENARIO	INCREMENTAL FORECAST CONSULTATIONS LOW SCENARIO	INCREMENTAL FORECAST CONSULTATIONS HIGH SCENARIO
9	La Costa / Campo ²		1	4	1	5
10	Jacumba		0	0	1	9
TOTAL ¹			1	4	2	14
Notes:						
(1) Totals may not sum due to rounding						
(2) Development forecasts for the Campo Band of the Kumeyaay Indians are presented in Chapter 6.						

126. The number of consultations is predicted to be whole (integers) that are spread evenly across years and over time. That is, for two predicted consultations, one is predicted to occur every eight years (in 2015 and 2023). If one consultation is anticipated, it is predicted to occur in 2019.
127. Average consultation costs (as shown in Exhibit 2-2 in Chapter 2) are applied to the number of predicted formal consultations based on the low and high scenarios. The total

⁷⁴ Industrial Economics, Incorporated, "Draft Economic Analysis of Proposed Critical Habitat Designation for the Quino Checkerspot Butterfly," prepared for the U.S. Fish and Wildlife Service, June 2001.

⁷⁵ Exhibit 4-5 shows forecast consultation activity; it displays whole, not partial consultations. Parts of consultations that are apportioned to incremental impacts are included in impact totals but not represented in Exhibit 4-5.

estimated post-designation consultation costs are presented in Exhibit 4-6. Consultations are forecast to occur only in Units 9 and 10, since these units are not covered by an existing or planned HCP. Units 9 and 10 are not being considered for exclusion. In the baseline, future costs range from \$7,130 to \$30,900 and incremental administrative costs of the range from \$21,400 to \$160,000. All costs are presented in present value terms assuming a seven percent discount rate.

EXHIBIT 4-6 TOTAL POST-DESIGNATION ADMINISTRATIVE COSTS OF DEVELOPMENT PROJECTS (2008 - 2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	BASELINE		INCREMENTAL	
			LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO
9	La Costa / Campo ²		\$7,130	\$30,900	\$11,900	\$64,900
10	Jacumba		\$0	\$0	\$9,500	\$95,200
TOTAL ¹			\$7,130	\$30,900	\$21,400	\$160,000

Notes:

(1) Totals may not sum due to rounding

(2) Development forecasts for the Campo Band of the Kumeyaay Indians are presented in Chapter 6.

4.8.2 PROJECT MODIFICATION COSTS

128. In general, during the section 7 consultation process, the Service recommends compensating for impacts to the butterfly and its habitat resulting from residential development by purchasing land and protecting it for the benefit of the butterfly. Service biologists have increased the land compensation ratios as they have become more familiar with the habitat and the changing threats to and needs of the butterfly.⁷⁶ Because the more recent consultations have recommended conservation measures based on more detailed knowledge about localized habitat and threats, this analysis relies on compensation ratios from two recent consultations in 2004 and 2005. These consultations had effective habitat compensation ratios of 2:1 and 3:1, respectively.⁷⁷ This analysis applies the average, a compensation ratio of 2.5 acres for each acre of development in Units 9 and 10 where no HCPs are present or planned.⁷⁸

⁷⁶ Written communication from Service Biologist, May 7, 2008.

⁷⁷ See U.S. Fish and Wildlife Service. "Formal Section 7 Consultation for the Lake Elsinore Unified School District, School Site 15," Formal Consultation # FWS-WRIV-3610.3, with the US Army Corps of Engineers. February 25, 2004 and U.S. Fish and Wildlife Service. "Formal Section 7 Consultation for the Lake Elsinore Unified School District, School Site 15," Formal Consultation with the US Army Corps of Engineers. June 06, 2005. The 2007 consultation "French Valley Industrial Project" had a compensation ratio of 10 to 1. Since this ratio is much higher than the other historical compensation ratios, the 2007 ratio is treated as an outlier and not included in the average ratio calculation.

⁷⁸ The Service does not anticipate requiring more stringent compensation as a result of the critical habitat designation (Written communication from Service Biologist, May 7, 2008).

129. As recently as 2007, impacts to butterfly critical habitat have been offset using conservation banks outside of designated areas of critical habitat.⁷⁹ Therefore, this analysis assumes that compensation land can be purchased outside of critical habitat, and applies local conservation bank prices to estimate impacts. The 2008 designation is not expected to change the location of offset land purchases from current practices.⁸⁰ The average price per acre at local land banks is \$30,500.⁸¹ This offset price is used to calculate impacts for Units 9 and 10 since they are not covered by HCPs, and for Unit 8 which will be covered by the San Diego County MSCP.

Western Riverside MSHCP

130. Chapter 3 broadly describes the design of the Western Riverside MSHCP. The MSHCP differs from other HCPs in that it is a criteria-based plan, wherein each cell (a geographical unit generally 160 acres in size) is ascribed specific conservation criteria. The Criteria Area is the area in which the MSHCP conservation criteria will be applied and in which 153,000 acres of new conservation will be designated to contribute toward assembly of the overall MSHCP conservation goals, including conserving the butterfly.
131. Development of individual single-family homes on existing parcels in accordance with existing land use regulations is a Covered Activity (i.e., receives State and Federal take authorization) within the Criteria Area. An application for the issuance of a grading permit or a site preparation permit within the Criteria Area will be subject to review against the MSHCP Conservation Criteria.
132. To determine the conservation criteria of the parcels in the proposed critical habitat area, a random sample of 100 parcels was taken (from more than 1,700 parcels). The criteria of the 100-parcel sample were determined using the Riverside County Land Information System (RCLIS). Approximately 17 parcels were not part of the Criteria Area. The criteria of the remaining 83 parcels specify between 35 and 85 percent preservation. Of the total acreage of the 100 parcels sampled, 50 percent is either not a part of the Criteria Area or within the Criteria Area but not identified for preservation. The other 50 percent of the total acreage is part of the Criteria Area and will be preserved and have no development. These sample characteristics were then extrapolated to the entire relevant study area.
133. Based upon the random sampling process just described, the analysis assumes that 50 percent of the study area acres forecast for development in the MSHCP is subject to avoidance and that no homes can be built on this land. The direct impact of conservation is the opportunity cost of the development that would otherwise have taken place. Because data on the value of raw land are scarce, particularly in areas far from the

⁷⁹ The Service has been tasked with maintaining the function and capacity of critical habitat units since the 2004 *Gifford Pinchot Task Force v. United States Fish and Wildlife Service decision*. The Service determines destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional to serve its intended conservation role for the species.

⁸⁰ Personal communication with Service Biologists, May 13, 2008.

⁸¹ Electronic communication from McCollum Associates, May 1, 2008.

development horizon where few sales transaction have taken place in recent years, the value of raw land is back-calculated based on information from recent home sales. The current value of raw land is estimated based on the average number of homes per acre in the area, the median home price, and typical construction costs for new homes. The difference between a home's sale price and construction price, adjusted for the acreage of the lot, provides the value of the raw land on the leading edge of the development frontier. To apply this value to land unlikely to be developed for many years (e.g., 5, 10, 15 years), the raw land value is discounted, using the social discount rate applied elsewhere in this analysis, over the number of years until development is likely to occur.⁸² For the purposes of this analysis, development activity is assumed to be spread evenly between 2008 and 2030. For additional details of the calculation of raw land values, see Appendix E.⁸³

134. For the other 50 percent of land projected for development, a mitigation fee will be paid. The analysis uses the mitigation fees for the City of Temecula because it is the closest urbanized area, and is most likely to absorb residences in the unincorporated part of the county. Mitigation fees in Temecula for the MSHCP are specified per dwelling unit developed as \$1,860 (for development of less than eight housing units) and \$1,191 (between 8.1 and 14 housing units) and \$968 (if developing more than 14 housing units).⁸⁴ The mitigation fees are applied to the acreage of forecast development land within the census tract, using a weighted average of the mix of residence types from the 2000 census.⁸⁵
135. Development delay costs are the opportunity costs of not being able to develop for some period of time. The delay cost (an asset holding cost) is the amount of interest that the value of the asset could have made as a financial asset during that period. This is calculated by multiplying the value of the lot to be developed with the market interest rate and the time period. The market interest rate assumed in this analysis is seven percent.
136. The development of the Western Riverside MSHCP was influenced by the 2002 critical habitat designation for the butterfly. However, it is unlikely that the plan will be revised based on the currently proposed revisions to critical habitat, as such no new project modifications are likely to result from the final rule. Costs resulting from the implementation of the plan are attributed to the existing, baseline regulation.

⁸² The analysis includes the opportunity cost of not developing for the first 23 years only.

⁸³ Appendix E also provides details on how the annualized values for lands under the MSHCP and Chula Vista Subarea Plan are calculated. These annualized values include annualized values over 23 years for conservation expenditures added to annuity values for property values losses, where development is avoided.

⁸⁴ City of Temecula website, available at <http://www.cityoftemecula.org/Temecula/Government/CommDev/Forms/Fees.htm>, accessed on May 7, 2008.

⁸⁵ The weighted average approach enables the estimated fee to reflect the distribution of existing building types. This is an improvement over taking a simple average of the fee structure.

Chula Vista Subarea Plan

137. The City of Chula Vista formed the Chula Vista Subarea plan under the San Diego Multiple Species Conservation Plan to include a butterfly recovery component sufficient to warrant coverage for the butterfly under the City's incidental take permit. The Chula Vista Subarea Plan includes a Preserve Area that will eventually encompass approximately 5,000 acres of the City's most sensitive open space areas. In addition, another approximately 4,200 acres outside the City's jurisdiction will be preserved as a result of development occurring within the City's urban boundaries.⁸⁶ The Preserve Area was designed to overlap with the 2002 critical habitat designation for the butterfly.⁸⁷
138. The study area overlapping the Chula Vista Subarea plan falls within designated Preserve Areas. As a result, all development will be avoided, and the opportunity cost of this avoidance is the value of the lost development potential during the 23-year period. To capture this opportunity cost, the value of the raw land is estimated using the methodology described above under the Western Riverside MSHCP. Because the Chula Vista Subarea plan is unlikely to be modified if critical habitat is revised, this analysis attributes these costs to existing baseline regulations.

San Diego County MSCP - Quino Amendment

139. Efforts began prior to 2001 to amend the San Diego County MSCP to include incidental take coverage for the butterfly.⁸⁸ The amendment is intended to cover all residential development within proposed Unit 8, and proposes that all forecast development be offset through the purchase of credits in a land bank. The anticipated compensation ratio ranges are 3:1 or 5:1; therefore, this analysis assumes an average ratio of 4:1.⁸⁹ The analysis uses an estimated land price of \$30,500 per acre.⁹⁰ The County has asked for developers to voluntarily not develop in the area for two years while the HCP amendment is finalized and ratified. Local developers are expected to comply, then begin building again once the HCP is finalized.⁹¹ As a result, the development value of the land is temporarily lost during this two-year time period. This value is calculated using the methodology described above under the Western Riverside MSHCP. The analysis also assumes that no development takes place until the plan is amended.⁹² The costs of a two-year delay (the

⁸⁶ City of Chula Vista MSCP Subarea Plan, 2003.

⁸⁷ Personal communication with Josie McNeely, Associate Planner for the City of Chula Vista, on May 7, 2008.

⁸⁸ Industrial Economics, Incorporated, "Draft Economic Analysis of Proposed Critical Habitat for the Quino Checkerspot Butterfly," prepared for the U.S. Fish and Wildlife Service, June 2001.

⁸⁹ County of San Diego, "Draft County of San Diego Multiple Species Conservation Program Quino Checkerspot Butterfly Amendment: Summary of Proposed Conservation Policies," March 18, 2008.

⁹⁰ Electronic communication from McCollum Associates, May 1, 2008.

⁹¹ Written communication from Tom Oberbauer, Chief Multiple Species Conservation Planning for the San Diego County Department of Planning and Land Use, on May 27, 2008.

⁹² Ibid. San Diego County currently recommends avoiding occupied butterfly habitat. In anticipation of the amendment, developers are likely to wait to begin projects in these areas.

time period anticipated for completion of the amendment) are included (see Section 4.8.3 for discussion of methodology).

140. Because the development of this plan pre-dates the current proposal as well as the 2001 critical habitat proposal, the analysis assumes that the listing of the species prompted these efforts. Therefore, the costs associated with implementing the plan are attributed to the baseline regulatory environment. To the extent that the requirements of the final plan differ from the current proposal, costs may be over- or understated.

Summary of Project Modification Impacts

141. Exhibit 4-7 summarizes the present value baseline and incremental impacts associated with butterfly conservation efforts, assuming a seven percent discount rate. Total baseline impacts in areas proposed for designation range from \$635 million to \$642 million over the period 2008 through 2030. Incremental impacts range from \$7.9 million to \$42.9 million and are concentrated in Units 9 and 10. Total baseline impacts in areas considered for exclusion are estimated to be \$122 million.

4.8.3 IMPACTS FROM DEVELOPMENT DELAYS

142. In addition to the administrative costs of consultations and the project modifications necessary to satisfy consultation requirements, the consultation process may also delay project completion. There may also be delays for development projects with HCPs to make sure that the projects are compliant with HCP requirements. This section first discusses the methodology for estimating the economic impacts from potential time delays, then it estimates the cost of those delays for the low and high development impact scenarios.

**EXHIBIT 4-7 FORECAST PROJECT MODIFICATION IMPACTS OF DEVELOPMENT
(2008 - 2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)**

UNIT	UNIT NAME	CENSUS TRACT (2000)	BASELINE LOW SCENARIO	BASELINE HIGH SCENARIO	INCREMENTAL LOW SCENARIO	INCREMENTAL HIGH SCENARIO
8	Otay	06073010014	\$52,400,000			
		06073010015	\$4,500,000			
		06073013313	\$0			
		06073021100	\$4,220,000			
		06073021302	\$427,000,000			
		06073021303	\$6,080,000			
		06073021304	\$12,800,000			
9	La Costa / Campo ²		\$4,250,000	\$12,500,000	\$2,900,000	\$16,100,000
10	Jacumba ³		\$1,670,000	\$0	\$5,020,000	\$26,800,000
Subtotal ¹			\$513,000,000	\$520,000,000	\$7,920,000	\$42,900,000
CONSIDERED FOR EXCLUSION						
1	Warm Springs		\$24,900,000			
2	Skinner/Johnson		\$1,470,000			
3	Sage		\$756,000			
4	Wilson Valley		\$3,320,000			
5	Vail Lake/Oak Mountain		\$2,190,000			
6	Tule Peak		\$1,470,000			
7	Bautista		\$3,470,000			
8	Otay	06073010014	\$2,380,000			
		06073013313	\$82,300,000			
		06073021302	\$0			
Subtotal ¹			\$122,000,000			
TOTAL			\$635,000,000	\$642,000,000	\$7,920,000	\$42,900,000

Notes:

(1) Totals may not sum due to rounding

(2) Development forecasts for the Campo Band of the Kumeyaay Indians are presented in Chapter 6.

(3) The range of forecasts for impacts in Unit 10 appear confusing, since the forecast impacts in the low scenario are greater than the forecast impacts in the high scenario. Total project modification impacts are divided between incremental and baseline impacts. The primary low and high impacts are assigned to the incremental impacts. The low forecasts of baseline impacts are the residuals left over from subtracting the incremental impacts from the total impacts.

143. As discussed above in Section 4.8.2, the value of an undeveloped parcel of land represents the present value stream of future uses of that parcel. For example, an undeveloped parcel of land that is zoned to accommodate a maximum of five single-family houses, but is unlikely to be developed for 10 years due to the regional demand for housing, is roughly worth the market price of those five homes, minus construction/development costs, discounted by 10 years.

144. The section 7 consultation process may extend the time horizon for development projects. For example, based on review of the consultation history, the process of undertaking a formal consultation with the Service generally lasts six months. New development projects within HCPs must make sure that their plans satisfy the rules and requirements of the HCP. Making sure that the residential development projects is HCP compliant may or may not involve internal consultation by the Service. Regardless of any internal Service consultation process, however, there will be costs associated with investigating and verifying HCP compliance. The estimated delay associated with this process is estimated to be 1.5 months.⁹³
145. If development is delayed by the consultation process or by making sure that a development project is HCP compliant, the opportunity cost associated with the value of land delayed from being put to its highest-value use may be estimated by discounting the value of that parcel by the additional years of delay. This analysis assumes that the delays discussed in the previous paragraph occur for all development projects in the study area. Because development activity is assumed to occur at a steady pace throughout the time period of the analysis (2008 - 2030), the analysis assumes that the opportunity costs of delay are also spread evenly through this time period. Exhibit 4-8 summarizes the delay costs, which are attributed to the baseline or incrementally to critical habitat designation based on the same logic used to allocate project modification costs.
146. The delay costs in Exhibit 4-8 also include the impacts of the two-year delay on construction within the area covered by the Quino Amendment to the San Diego County MSCP. San Diego County is asking developers not to build in the area to be covered by the Quino Amendment during the two years it will take to finalize the amendment.⁹⁴ The opportunity cost of not building on that land for those two years is included as a cost of delay for the proposed critical habitat unit within the tracts within Unit 8 that are not considered for exclusion.

⁹³ Within the Western Riverside County MSHCP, project delays to coordinate with HCP requirements may take up to 1.5 months. See Riverside County Environmental Programs Department web-site: <http://www.rctlma.org/epd/erpqa.html> Accessed on September 10, 2008. Comparable delay costs are assumed to occur within the area covered by the proposed Quino Amendment to the San Diego County MSCP.

⁹⁴ Written communication from Tom Oberbauer, Chief Multiple Species Conservation Planning for the San Diego County Department of Planning and Land Use, on May 27, 2008.

EXHIBIT 4-8 DEVELOPMENT DELAY COSTS (2008 - 2030, 2008 DOLLARS SEVEN PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	BASELINE LOW SCENARIO	BASELINE HIGH SCENARIO	INCREMENTAL LOW SCENARIO	INCREMENTAL HIGH SCENARIO
8	Otay	06073010014	\$734,000			
		06073010015	\$1,350,000			
		06073013313	\$0			
		06073021100	\$12,500			
		06073021302	\$3,790,000			
		06073021303	\$246,000			
		06073021304	\$36,900			
9	La Costa / Campo ¹		\$28,300	\$83,500	\$19,400	\$107,000
10	Jacumba ³		\$9,840	\$0	\$29,500	\$157,000
Subtotal ²			\$6,200,000	\$6,250,000	\$48,900	\$265,000
CONSIDERED FOR EXCLUSION						
1	Warm Springs		\$108,000			
2	Skinner/Johnson		\$6,370			
3	Sage		\$3,280			
4	Wilson Valley		\$14,400			
5	Vail Lake/Oak Mountain		\$9,470			
6	Tule Peak		\$6,390			
7	Bautista		\$15,100			
8	Otay ⁴	06073010014				
		06073013313				
		06073021302				
Subtotal ²			\$163,000			
TOTAL³			\$6,370,000	\$6,250,000	\$48,900	\$265,000

Notes:

(1) Development forecasts for the Campo Band of the Kumeyaay Indians are presented in Chapter 6.

(2) Totals may not sum due to rounding.

(3) The range of forecasts for impacts in Unit 10 appear confusing, since the forecast impacts in the low scenario are greater than the forecast impacts in the high scenario. Total project modification impacts are divided between incremental and baseline impacts. The primary low and high impacts are assigned to the incremental impacts. The low forecasts of baseline impacts are the residuals left over from subtracting the incremental impacts from total impacts.

(4) No delay costs are included for the Chula Vista Sub-Area Plan areas; project modifications in these tracts are for total development avoidance, hence no development is delayed.

4.8.4 INDIRECT IMPACTS ASSOCIATED WITH DEVELOPMENT ACTIVITY

147. In addition to the costs incurred by private landowners and developers and summarized in the previous three sections, the BLM may incur butterfly conservation impacts related to future development activity. Recent development pressure has resulted in housing construction on private land abutting BLM land. The threat to development posed by fire, as highlighted by the 2007 wildfires in Southern California, prompted efforts by the BLM to construct 100-yard firebreaks on its lands near developed areas.
148. In the presence of the butterfly, this new fire-break requirement becomes costly. For the BLM to permit clearance, they must first determine if the butterfly is present, consult on actions that may threaten the butterfly, and then follow conservation measures when clearing. The impacts of this additional effort are estimated at \$100,000 per year for proposed Unit 8 during the entire time period of the analysis.⁹⁵ The costs are distributed across the census tracts that contain BLM land, proportionate to the amount of BLM land within the unit. The costs for proposed Unit 8 (\$13.05 per acre, per year) are then applied to the BLM land in the other proposed critical habitat units (Units 2 through 9). No BLM land is located in the areas considered for exclusion. The single year and net present value estimates are presented in Exhibit 4-9. Because these costs are for conducting surveys that would be undertaken regardless of the designation of critical habitat, and conservation measures taken when the butterfly is found to occupy the area, these costs are attributed to the baseline.

⁹⁵ Personal communication with Joyce Schlachter, San Diego County Biologist, Bureau of Land Management, South Coast Palm Springs Field Office, May 27, 2008.

**EXHIBIT 4-9 BASELINE BLM FIRE BREAK EXPENDITURES
(2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)**

UNIT	UNIT NAME	CENSUS TRACT (2000)	ANNUAL EXPENDITURE	NET PRESENT VALUE (2008 - 2030)
2	Skinner/Johnson		\$1,400	\$16,800
3	Sage		\$1,640	\$19,800
4	Wilson Valley		\$6,110	\$73,700
5	Vail Lake/Oak Mountain		\$10,700	\$129,000
6	Tule Peak		\$4,280	\$51,600
7	Bautista		\$16,000	\$192,000
8	Otay	06073010014	\$0	\$0
		06073010015	\$8,160	\$98,400
		06073013313	\$0	\$0
		06073021100	\$420	\$5,040
		06073021302	\$88,800	\$1,070,000
		06073021303	\$0	\$0
		06073021304	\$2,600	\$31,300
9	La Costa / Campo ²		\$23,900	\$288,000
10	Jacumba		\$0	\$0
TOTAL¹			\$164,000	\$1,980,000
Note: (1) Totals may not sum due to rounding				

4.9 TOTAL POST-DESIGNATION BASELINE IMPACTS

149. Total baseline post-designation impacts include the impacts of administrative consultation costs, project modifications, time delays, and conservation efforts associated with fire breaks resulting from residential development. These impacts also include the continued \$140 per acre collected every year for the community facility district in Otay Ranch, which amount to \$1.6 million annually, with a net present value of \$19.2 million assuming a seven percent discount rate.

EXHIBIT 4-10 TOTAL POST-DESIGNATION BASELINE IMPACTS
(2008 - 2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE		ANNUALIZED IMPACTS ¹	
			LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO
2	Skinner/Johnson		\$16,800		\$1,400	
3	Sage		\$19,800		\$1,640	
4	Wilson Valley		\$73,700		\$6,110	
5	Vail Lake/Oak Mountain		\$129,000		\$10,700	
6	Tule Peak		\$51,600		\$4,280	
7	Bautista		\$192,000		\$16,000	
8	Otay	06073010014	\$53,700,000		\$4,450,000	
		06073010015	\$7,130,000		\$591,000	
		06073013313	\$40,800		\$3,390	
		06073021100	\$5,010,000		\$415,000	
		06073021302	\$442,000,000		\$36,700,000	
		06073021303	\$6,840,000		\$567,000	
		06073021304	\$17,800,000		\$1,480,000	
9	La Costa / Campo ²		\$4,570,000	\$12,900,000	\$379,000	\$1,070,000
10	Jacumba ³		\$1,680,000	\$0	\$140,000	\$0
Subtotal			\$540,000,000	\$546,000,000	\$44,700,000	\$45,300,000
CONSIDERED FOR EXCLUSION						
1	Warm Springs		\$25,000,000		\$1,750,000	
2	Skinner/Johnson		\$1,480,000		\$103,000	
3	Sage		\$759,000		\$53,200	
4	Wilson Valley		\$3,340,000		\$234,000	
5	Vail Lake/Oak Mountain		\$2,220,000		\$154,000	
6	Tule Peak		\$1,470,000		\$103,000	
7	Bautista		\$3,490,000		\$244,000	
8	Otay	06073010014	\$2,590,000		\$184,000	
		06073013313	\$83,000,000		\$5,820,000	
		06073021302	\$26,900		\$2,230	
Subtotal			\$123,000,000		\$8,650,000	
TOTAL			\$663,000,000	\$670,000,000	\$53,400,000	\$53,900,000

Notes:

Totals may not sum due to rounding

(1) Annualized values are the sum of the annualized value of total expenditures over the 23 year period and annuity value for the price of avoided land and for impacts through 2030. The annuity values for the lost property values continue at that level beyond 2030.

(2) Development forecasts for the Campo Band of the Kumeyaay Indians are presented in Chapter 6.

(3) The range of forecasts for impacts in Unit 10 appear confusing, since the forecast impacts in the low scenario are greater than the forecast impacts in the high scenario. Total project modification impacts are divided between incremental and baseline impacts. The primary low and high impacts are assigned to the incremental impacts. The low forecasts of baseline impacts are the residuals left over from subtracting the incremental impacts from total impacts.

4.10 TOTAL INCREMENTAL IMPACTS

150. The majority of incremental impacts result from conservation efforts in areas not covered by existing or planned HCPs and where the butterfly is not detected in pre-construction surveys. In addition, a small portion of the costs results from the additional administrative effort required to consider adverse modification during the consultation process.

EXHIBIT 4-11 TOTAL INCREMENTAL IMPACTS
(2008 - 2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE		ANNUALIZED IMPACT	
			LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO
8	Otay	06073010014	\$0	\$0	\$0	\$0
		06073010015	\$0	\$0	\$0	\$0
		06073013313	\$0	\$0	\$0	\$0
		06073021100	\$0	\$0	\$0	\$0
		06073021302	\$0	\$0	\$0	\$0
		06073021303	\$0	\$0	\$0	\$0
		06073021304	\$0	\$0	\$0	\$0
9	La Costa / Campo ²		\$2,930,000	\$16,200,000	\$243,000	\$1,350,000
10	Jacumba		\$5,060,000	\$27,000,000	\$420,000	\$2,240,000
Subtotal ¹			\$7,990,000	\$43,300,000	\$663,000	\$3,590,000
CONSIDERED FOR EXCLUSION						
1	Warm Springs		\$0	\$0	\$0	\$0
2	Skinner/Johnson		\$0	\$0	\$0	\$0
3	Sage		\$0	\$0	\$0	\$0
4	Wilson Valley		\$0	\$0	\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0	\$0	\$0
6	Tule Peak		\$0	\$0	\$0	\$0
7	Bautista		\$0	\$0	\$0	\$0
8	Otay	06073010014	\$0	\$0	\$0	\$0
		06073013313	\$0	\$0	\$0	\$0
		06073021302	\$0	\$0	\$0	\$0
Subtotal ¹			\$0	\$0	\$0	\$0
TOTAL			\$7,990,000	\$43,300,000	\$663,000	\$3,590,000
Notes:						
(1) Totals may not sum due to rounding						
(2) Development forecasts for the Campo Band of the Kumeyaay Indians are presented in Chapter 6.						

4.11 KEY SOURCES OF UNCERTAINTY

151. The analysis relies on several assumptions that introduce a degree of uncertainty into the estimates. These assumptions are necessary due to a lack of readily available information.

- The analysis relies on projections of future development activity provided by SANDAG and SCAG and allocates the development spatially using BEC's model. These data sources represent the best currently available information. However, if future development activity is significantly different from these projections or occurs in significantly different locations, impacts may be over- or understated.
- Development activity is assumed to be occur at a constant rate over the time period of the analysis. If projects occur more frequently in earlier periods, costs will be understated. Conversely, if development activity is more likely in later periods, impacts will be overstated.
- This analysis assumes that the Quino Amendment to the San Diego County MSCP will be finalized in approximately its current form, as this represents the most probable scenario. If the plan is significantly revised based on this proposed rule, then incremental costs associated with this revision are not accounted for in this analysis.

CHAPTER 5 | POTENTIAL ECONOMIC IMPACTS TO NON-RESIDENTIAL DEVELOPMENT

152. Non-residential development projects may result in the loss and fragmentation of butterfly habitat and potential disruptions of landscape connectivity. This Chapter first provides an overview of the methodology used to estimate impacts resulting from conservation measures implemented for utility and transportation infrastructure, and for agricultural, industrial or commercial development. Next, it estimates these impacts. Total pre-designation and post-designation baseline, and incremental impacts, as well as discussion of sources of uncertainty in the analysis are provided at the conclusion of the Chapter.

5.1 METHODOLOGY USED TO IDENTIFY AND ESTIMATE IMPACTS

153. The first part of the investigation involved discussions with the Service and review of the consultation history, species recovery plan, 2001 proposal for critical habitat, 2001 economic analysis of proposed critical habitat, and 2002 designation of critical habitat. This research provided a thorough list of many ongoing projects.

154. Next, for San Diego and Riverside counties, queries were made to stakeholders including: County planning departments, County transportation departments, the California Department of Transportation (CALTRANS), several U.S. Bureau of Land Management field offices, Cleveland and San Bernardino National Forests, California Department of Fish and Game, and several environmental consultants working in the area of wildlife preservation.⁹⁶ Stakeholders referenced in the consultation history were also contacted.

155. These sources combined to provide a comprehensive listing of activities that could affect the butterfly in the study area. The location of the activities discussed with stakeholders was then established using GIS mapping tools. Several of the activities, such as the CALTRANS construction of a transportation facility on Interstate Highway 805 were found to not be within the study area. The activities and projects that are likely to have impacts due to conservation of the species and proposed critical habitat are:

- **Transportation:** The widening of State Route 79. This project also involves the construction of a butterfly bridge over Clinton Keith Road,

⁹⁶ Impacts experienced by the Cahuilla Band of Indians and the Campo Band of Kumeyaay Indians are addressed separately in Chapter 6.

- **Utility Infrastructure Development:** Operation of the Otay Mesa Energy Center, Operation of San Diego Gas and Electric facilities, and the potential construction of the Sunrise Powerlink electrical transmission lines.

156. No commercial and industrial development or agricultural development projects could be identified. These activities are discussed qualitatively at the conclusion of this Chapter.

5.2 IMPACT ESTIMATION

157. The primary source for estimating the costs of butterfly conservation efforts is information provided by stakeholders. Cost information was evaluated for plausibility, then proportionately attributed to the appropriate unit based on how much of the activity is or will take place in the study area.
158. Exhibit 5-1 summarizes past project impacts. The exhibit describes the activity, provides a summary of the estimated impacts and when they occurred, and summarizes the estimation methodology. Exhibit 5-2 provides impact estimates for the three identified non-residential projects that are forecast to occur during the time period 2008 through 2030. In both exhibits, costs are presented for each year of impact in undiscounted dollars.
159. This Chapter uses the methodology for identification of baseline and incremental impacts applied in Chapter 4. For the Sunrise Powerlink construction project, the butterfly may not be detected on the entire site. Based on the survey information discussed in Chapters 3 and 4, this analysis assumes that butterflies are detected on 52 percent of the site.⁹⁷

⁹⁷ US Fish and Wildlife Service, Memorandum: Comments on how DEA Should Estimate Incremental Costs for Quino Checkerspot Butterfly Critical Habitat Designation. Received October 24, 2008. Note that the Service recommends detection rates ranging from 44 percent to 59 percent. For simplicity, this analysis uses the average of the two rates.

EXHIBIT 5-1 PRE-DESIGNATION NON-RESIDENTIAL DEVELOPMENT IMPACTS

UNIT	PROJECT	ACTIVITY	PROJECT SUMMARY	ESTIMATION METHODOLOGY	ECONOMIC IMPACTS (UNDISCOUNTED)
8	Construction of Calpine Corporation Otay Mesa Energy Center	Utility Infrastructure, San Diego County	In 2001, Calpine Corporation purchased a power plant project and 40 acres of land in the area of proposed critical habitat from the Pacific Gas and Electric Company. ¹ Calpine is currently building an expanded power plant. In 2000, 2003, 2005, Calpine consulted with the Service for the butterfly as well as other listed species. ^{2,3,4} Calpine purchased approximately 38 acres to compensate for its 46 acre footprint. Calpine purchased the land in 2001 in the San Miguel Ranch Mitigation Bank; this purchase price is estimated to be \$100,000. Calpine paid \$333,333 into a fund with the San Diego Foundation, called the Quino Checkerspot Butterfly Fund, in August, 2001. In lieu of an additional mitigation payment, Calpine transferred \$440,000 to the Friends of the San Diego National Wildlife Refuge in 2007. ⁵ These impacts are divided across the tracts within Unit 8 proportionate to the tract acreage.	Information is from the Riverside County Planning Department. GIS analysis verified the location of the project.	<ul style="list-style-type: none"> ● \$15,000 in 2000 ● \$100,000 in 2001 ● \$333,333 in 2001 ● \$15,000 in 2003 ● \$15,000 in 2005 ● \$440,000 in 2007 <p>In areas not considered for exclusion.</p>
9	San Diego Gas and Electric Operations in Unit 9	SDGE development of low-impact HCP for operations in proximity to habitat.	SDGE prepared a low effect HCP for the butterfly in 2007 because it operates a plant in areas occupied by the butterfly. ⁶ The HCP provided for incidental take as a result of ongoing operations and maintenance activities as well as construction of new facilities in San Diego and Riverside Counties. Implementation of the HCP could result in the loss of up to 33 acres of butterfly habitat over the 50-year term of the permit. ⁷ Up to 30 acres of the total impacts of the HCP would be in critical habitat. In order to mitigate the impacts from the HCP, SDG&E is conducting protocol-level butterfly surveys (like those discussed in Chapter 7) and site specific assessments for butterfly habitat. In addition, SDG&E will mitigate unavoidable impacts to butterfly habitat at a 1:1 ratio in areas where the butterfly is not detected and a 2:1 ratio where it is detected.	Information is from the San Diego Gas and Electric for creating the HCP and from the consultation record.	<ul style="list-style-type: none"> ● \$153,000 per year from 1998-2007 <p>In areas not considered for exclusion.</p>

Notes:

(1) Personal communication with Edward Merrihew, Calpine, on May 8, 2008.

(2) US Fish and Wildlife Service. Biological Opinion on the Otay Mesa Generating Project, East Otay Mesa, San Diego County, California; CFWO Project #783.3 (1-6-00-F-54), November 22, 2000.

(3) US Fish and Wildlife Service. Reinitiation of the Biological Opinion and Conference Opinion for the Calpine Corporation-Otay Mesa Generating Project, East Otay Mesa, San Diego County, California; (1-6-00-F-54R; California Energy Commission License 99-AFC-5), September 02, 2003.

(4) US Fish and Wildlife Service. Biological Opinion on the Otay Mesa Energy Center (Formally Calpine Otay Mesa Generating Project) (FWS File No. 1-6-06-F-783; Corps File No. 200501347-JMB), December 02, 2005.

(5) Personal communication with Edward Merrihew, Calpine, on May 8, 2008.

(6) Personal communication with Representative for Sunrise Powerlink Project, December 6, 2007.

(7) San Diego Gas and Electric Company QCB Low-Effect Habitat Conservation Plan, Prepared for SDG&E by Ebbin, Moser and Skaggs LLP, on May, 2007.

EXHIBIT 5-2 NON-RESIDENTIAL DEVELOPMENT POST-DESIGNATION IMPACTS

UNIT	ACTIVITY	PROJECT SUMMARY	ESTIMATION METHODOLOGY	ECONOMIC IMPACTS (UNDISCOUNTED)
1 CFE	Widening of California State Route 79 in Riverside County	State Route 79 (SR79) is a planned roadway under the Western Riverside County Multiple Species Habitat Conservation Plan within proposed critical habitat. This existing road crosses two habitat areas and may interrupt wildlife movement in these areas. ¹ Widening of SR79 from four to six lanes is expected to be completed in 2010. As mitigation for the SR79 widening, the County is proposing approximately 20 acres of butterfly habitat enhancement and the funding of the Clinton Keith Quino Checkerspot Butterfly Bridge (which would otherwise be the responsibility of the Western Riverside County Regional Conservation Authority). The cost of monitoring and habitat enhancement is approximately \$650,000. The cost of the bridge is \$2.12 million. One formal consultation is forecast in 2009.	Information is from the Riverside County Planning Department. GIS analysis verified the location of the project.	<u>Baseline</u> <ul style="list-style-type: none"> ● \$2.12 Million in 2009 ● \$15,000 in 2009 ● \$625,000 in 2010 <u>Incremental</u> <ul style="list-style-type: none"> ● \$5,000 in 2009 <p>In areas considered for exclusion.</p>
8 CFE	San Diego County Transportation development	Planned road construction projects in proposed critical habitat within the MSCP Preserve Area include Otay Valley Road, Hunte Road, and La Media Road. Otay Valley Road and Hunte Road are expected to be open to traffic in 2015 and La Media Road in 2020. Under the Chula Vista Subarea Plan, roads are mitigated through habitat surveys, and preventative measures during design and construction if butterfly are present. The Plan requires mitigation of construction impacts through restoration or enhancement of at least ten acres of butterfly habitat within the Preserve in the Salt Creek / Otay River Valley area. Costs for restoration stabilize at a approximately \$200 per acre, per year for periodic nonnative plant control activities and other habitat management tasks. Therefore, this analysis applies a \$200 per acre mitigation fee on ten acres of butterfly habitat for all future road and public facility projects in the MSCP.	Road development data provided by SANDAG; cost estimates for mitigation are taken from the Chula Vista Subarea Plan	<u>Baseline</u> <ul style="list-style-type: none"> ● \$4,000 per year from 2015-2030 for La Media and Otay Valley Roads ● \$2,000 per year from 2020-2030 for Hunte Road <p>In areas considered for exclusion.</p>
9 PFD	San Diego Gas and Electric Operations	SDGE purchased land offsets for the low-effect HCP, developed between 1998 and 2007 (see Exhibit 5-1). In order to mitigate the impacts from the HCP, SDG&E is conducting protocol-level butterfly surveys (like those discussed in Chapter 7) and site specific assessments for butterfly habitat. In addition, SDG&E will mitigate unavoidable impacts to butterfly habitat at a 1:1 ratio in habitat where the butterfly is not detected and a 2:1 ratio in habitat where it is detected. Note that because these impacts result from the existing HCP, they are attributed to the baseline regulatory environment.	Information is from SDGE website, HCP report.	<u>Baseline:</u> <ul style="list-style-type: none"> ● 2008: \$1.83 million <p>In areas not considered for exclusion.</p>

UNIT	ACTIVITY	PROJECT SUMMARY	ESTIMATION METHODOLOGY	ECONOMIC IMPACTS (UNDISCOUNTED)
9 PFD	Sunrise Powerlink power line project	<p>The Sunrise Powerlink project is a new electrical transmission line between the Imperial Valley and San Diego. While the preferred route bypasses proposed critical habitat, there is an alternative route within proposed critical habitat. Construction of this line, projected to begin in 2010, would require a consultation. The I-8 Alternative would impact 23.5 acres of the proposed critical habitat (6.9 acres of temporary impact and 16.6 acres of permanent impact through habitat removal). To off-set impacts of the I-8 Alternative, SDG&E would conduct 6.9 acres of on-site restoration and 20.3 acres of off-site acquisition and preservation of acres of critical habitat or other approved habitat.² The on-site remediation is projected to cost \$12,500 per acre and the off-set land purchase is projected to cost \$30,500 per acre.³ Butterflies may not be detected on the entire site; therefore a portion of the costs are considered to be incremental.</p>	<p>Information provided by Sunrise Powerlink during multiple interviews. Impacts are estimated as up to 20 percent of projected costs (The probability of the primary route being adopted is 80%).</p> <p>Survey detection rate used to estimate incremental impacts.</p>	<p><u>Baseline</u></p> <ul style="list-style-type: none"> ● \$9,000 in 2010 ● \$63,900 in 2010 ● \$15,000 in 2010 <p><u>Incremental</u></p> <ul style="list-style-type: none"> ● \$8,400 in 2010 ● \$60,000 in 2010 ● \$5,000 in 2010 <p>In areas not considered for exclusion.</p>
<p>Notes:</p> <p>(1) Western Riverside County MSHCP, available at http://www.rctlma.org/mshcp/volume1/index.html, accessed on May 12, 2008.</p> <p>(2) Draft Environmental Impact Report / Environmental Impact Statement and Proposed Land Use Amendment San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, prepared by Aspen Environmental Group for CPUC and BLM, on January, 2008.</p> <p>(3) Land bank prices are an average of prices provided in written communication from McCollum Associates, May 1, 2008.</p>				

5.3 QUALITATIVE DISCUSSION OF NON-RESIDENTIAL DEVELOPMENT IMPACTS

160. Some of the threats described in the proposed rule and the recovery plan are not quantifiable with readily available data. This section qualitatively reviews pertinent information from the investigation process that was not amenable to generating quantitative estimates of impacts. This information provides context of how non-residential development activities relate to the study area.

TRANSPORTATION DEVELOPMENT IN THE WESTERN RIVERSIDE MSHCP

161. Road maintenance on existing roadways is a “Covered Activity” under the Western Riverside MSHCP. Existing roadways within the MSHCP Criteria Area include interstates, freeways, State highways, city and county maintained roadways, and local roads that provide private property access. Maintenance activities for private roadways will be substantially limited in scope, including only such grading as necessary to restore a smooth driving surface, maintain existing graded shoulders within the existing rights-of-way, and essential weed abatement, excluding the application of any herbicides. Conservation efforts for road construction and for necessary operation and maintenance activities of public roads conducted for safety purposes are addressed in the provisions of the MSHCP.⁹⁸

TRANSPORTATION DEVELOPMENT IN THE CHULA VISTA SUBAREA PLAN

162. To analyze road construction related economic impacts, data on planned road construction was obtained from SANDAG. There are some planned road construction projects in the Chula Vista Preserve Area including Otay Valley Road, Hunte Road, and La Media Road. The Subarea Plan has provisions for road construction relevant to the conservation of the butterfly; however, GIS analysis determined that there are no planned transportation infrastructure projects within the Chula Vista Subarea Plan area. As a result, no transportation development impacts are forecast.

OTAY MESA LANDFILL: UNIT 8

163. Planners from San Diego County indicated that the eastern part of Otay Mesa in proposed critical habitat unit 8 is designated for use as a landfill. Although the designation is not current, there has been interest expressed by private developers to construct a landfill in the area.⁹⁹ It is premature to estimate impacts to a landfill project at this time because the details and timing of such a project have not yet been specified.

COMMERCIAL AND INDUSTRIAL DEVELOPMENT

164. Commercial and industrial development refers to development for business purposes that will serve the public or other businesses. Threats from this type of development may include displacement or habitat fragmentation. There were no publicly available data

⁹⁸ Cost estimates are not currently publicly available.

⁹⁹ Personal communication with Tom Oberbauer, Chief Multiple Species Conservation Planning for the San Diego County Department of Planning and Land Use, on May 8, 2008.

regarding proposed industrial and/or commercial development for the land not covered by HCPs, and there have been no consultations related to this activity. None of the interviewed stakeholders responded that there were industrial or commercial development projects pending. There are provisions for public and private development within the MSHCP.¹⁰⁰ This development may include construction of new schools, universities, City or County administrative facilities, jails, courts, juvenile facilities, parks, libraries, or other structures that serve the public. Local public capital projects would be mitigated under the MSHCP and would utilize a per acre mitigation fee based on the fee in place for private, commercial and industrial development. The Riverside County Planning Department was unable to provide any information about commercial or utility projects planned in the proposed critical habitat.¹⁰¹

AGRICULTURAL DEVELOPMENT

165. When the butterfly was listed, reduction and fragmentation of habitat by agricultural development was thought to be a primary threat.¹⁰² However, farmers in and adjacent to the study area are not expected to modify their activities. It is unlikely that a Federal nexus would be triggered on agricultural lands that would require consultation with the Service. Moreover, there is no evidence from past biological opinions or consultations of agricultural activities having been modified in order to conserve the butterfly or its habitat.

PESTICIDE USE

166. Federal agencies that own or manage land within the habitat do not use pesticides. BLM indicated that they do not currently and do not plan to use any herbicides or insecticides in or adjacent to the proposed critical habitat in the future.¹⁰³ There is also a “no use” policy for pesticides and herbicides on USFS lands.¹⁰⁴ The U.S. Navy indicated that they have not been using pesticides in critical habitat and plan to conduct weed management techniques on their lands in a manner compatible with conservation of the butterfly.¹⁰⁵ Therefore, it is unlikely that changes to pesticide use would result from critical habitat designation.

¹⁰⁰ Western Riverside County MSHCP, available at <http://www.rctlma.org/mshcp/volume1/index.html>, accessed on May 12, 2008.

¹⁰¹ Personal communication with Deputy Director of the Riverside County Planning Department Environmental Programs Department, on May 9, 2008.

¹⁰² 62 FR 2313

¹⁰³ Personal communication with Daniel Steward, BLM Resources Branch Chief, on May 1, 2008.

¹⁰⁴ Personal communication with Kristin Winter, USFS District Wildlife Biologist, on May 2, 2008.

¹⁰⁵ Personal communication with Kim O’Conner, Botanist for the Navy, on May 5, 2008.

5.4 PRE-DESIGNATION IMPACTS

167. Exhibit 5-3 reports the total present value of pre-designation impacts assuming a seven percent discount rate. Pre-designation impacts resulting from the construction of the Calpine Corporation Otay Mesa Energy Center are assigned to proposed Unit 8. These impacts have been divided across the census tracts in that unit proportionate to the area of those tracts.

EXHIBIT 5-3 TOTAL PRE-DESIGNATION IMPACTS TO NON-RESIDENTIAL DEVELOPMENT PROJECTS (1997-2007, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE
2	Skinner/Johnson		\$0
3	Sage		\$0
4	Wilson Valley		\$0
5	Vail Lake/Oak Mountain		\$0
6	Tule Peak		\$0
7	Bautista		\$0
8	Otay	06073010014	\$36,800
		06073010015	\$79,600
		06073013313	\$2,750
		06073021100	\$51,600
		06073021302	\$695,000
		06073021303	\$34,400
		06073021304	\$331,000
9	La Costa / Campo		\$2,260,000
10	Jacumba		\$0
Subtotal			\$3,490,000
CONSIDERED FOR EXCLUSION			
1	Warm Springs		\$0
2	Skinner/Johnson		\$0
3	Sage		\$0
4	Wilson Valley		\$0
5	Vail Lake/Oak Mountain		\$0
6	Tule Peak		\$0
7	Bautista		\$0
8	Otay	06073010014	\$0
		06073013313	\$0
		06073021302	\$0
Subtotal			\$0
TOTAL			\$3,490,000
Note:			
1. Totals may not sum due to rounding.			

5.5 POST-DESIGNATION BASELINE IMPACTS

168. The impacts summarized in Exhibit 5-4 are expected to occur regardless of the designation of critical habitat. These impacts result from the road widening in proposed Unit 1, continuing construction and operation of a power plant in proposed Unit 9, and the potential of a power line construction project to go through proposed Unit 9.

EXHIBIT 5-4 TOTAL POST-DESIGNATION BASELINE IMPACTS TO NON-RESIDENTIAL DEVELOPMENT PROJECTS (2008 - 2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE	ANNUALIZED
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0
6	Tule Peak		\$0	\$0
7	Bautista		\$0	\$0
8	Otay	06073010014	\$0	\$0
		06073010015	\$0	\$0
		06073013313	\$0	\$0
		06073021100	\$0	\$0
		06073021302	\$0	\$0
		06073021303	\$0	\$0
		06073021304	\$0	\$0
9	La Posta/Campo		\$1,910,000	\$158,000
10	Jacumba		\$0	\$0
Subtotal			\$1,910,000	\$158,000
CONSIDERED FOR EXCLUSION				
1	Warm Springs		\$2,520,000	\$209,000
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0
6	Tule Peak		\$0	\$0
7	Bautista		\$0	\$0
8	Otay	06073010014	\$7,730	\$641
		06073013313	\$23,600	\$1,960
		06073021302	\$991	\$82
Subtotal			\$2,550,000	\$212,000
TOTAL			\$4,460,000	\$370,000
Note: 1. Totals may not sum due to rounding.				

5.6 POST-DESIGNATION INCREMENTAL IMPACTS

169. Total incremental post-designation impacts result from administrative costs related to the SR-79 project consultation anticipated in 2009 and administrative and project modification costs related to the Sunrise Powerlink project. Total incremental impacts are presented in Exhibit 5-5.

EXHIBIT 5-5 TOTAL INCREMENTAL IMPACTS TO NON RESIDENTIAL DEVELOPMENT PROJECTS
(2008 - 2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE	ANNUALIZED
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0
6	Tule Peak		\$0	\$0
7	Bautista		\$0	\$0
8	Otay	06073010014	\$0	\$0
		06073010015	\$0	\$0
		06073013313	\$0	\$0
		06073021100	\$0	\$0
		06073021302	\$0	\$0
		06073021303	\$0	\$0
		06073021304	\$0	\$0
9	La Posta/Campo		\$64,000	\$5,310
10	Jacumba		\$0	\$0
Subtotal			\$64,000	\$5,310
CONSIDERED FOR EXCLUSION				
1	Warm Springs		\$4,670	\$387
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0
6	Tule Peak		\$0	\$0
7	Bautista		\$0	\$0
8	Otay	06073010014	\$0	\$0
		06073013313	\$0	\$0
		06073021302	\$0	\$0
Subtotal			\$4,670	\$387
TOTAL			\$68,700	\$5,700
Note: 1. Totals may not sum due to rounding.				

5.7 KEY SOURCES OF UNCERTAINTY

170. The sources of uncertainty in this analysis relate to the difficulty of forecasting future projects in the study area. This analysis queried a wide range of stakeholders to identify non-residential development projects that could be affected by the proposed rule. To the extent that future projects were not identified, impacts may be understated.

CHAPTER 6 | POTENTIAL ECONOMIC IMPACTS TO TRIBES

171. This Chapter provides an analysis of economic impacts associated with butterfly conservation activities on Tribal lands. The Cahuilla Band of Mission Indians of the Cahuilla Reservation, California (Cahuilla Band of Indians) and the Campo Band of Diegueno Mission Indians of the Campo Reservation, California (Campo Band of Kumeyaay Indians) are two Tribes that have lands included in proposed critical habitat. Specifically, the Cahuilla reservation encompasses 1,203 acres in proposed Unit 6 (Tule Peak) in Riverside County, and the Kumeyaay reservation encompasses 3,156 acres in proposed Unit 9 (La Posta/Campo) in San Diego County.
172. This analysis of impacts to Tribal lands relies on:
- Review of the section 7 consultation history, which provides background on past and on-going projects, as well as information on conservation measures taken;
 - Development projections provided by the Campo Band of Kumeyaay Indians for the Campo reservation;
 - Information about the likelihood of detecting butterflies within a proposed critical habitat unit and the average size of development projects discussed in detail in Chapter 4;
 - Information about other, non-development related impacts provided by the Campo Band of Kumeyaay Indians for the Campo reservation; and
 - Information about resident Tribal populations and potential development plans by the Cahuilla Band of Indians.
173. The Chapter first provides socioeconomic data on the Tribes relative to their home counties. This information illustrates the economic vulnerability of the Tribes. Next, the Chapter addresses impacts to the Campo Band of Kumeyaay Indians, followed by discussion of potential impacts to the Cahuilla Band of Indian land. Total pre-designation baseline impacts and post-designation baseline and incremental impacts are provided at the conclusion of the Chapter.
- 6.1 SOCIOECONOMIC BACKGROUND OF THE CAHUILLA BAND OF INDIANS AND THE CAMPO BAND OF KUMEYAAY INDIANS**
174. The Tribes govern their reservations and are responsible for the provision of public services to reservation residents in the same manner as county and city governments serve their constituents. Tribal governments, however, generally have far fewer resources

to draw from and often serve especially disadvantaged populations. As a result, impacts due to critical habitat designation may have a disproportionately negative effect on Tribes. This section provides some information about the overall difference in conditions in the relevant counties and on the reservations.

175. There are nine Indian reservations in Riverside, Imperial, and San Diego counties that are managed by different bands of Cahuilla Indians: Agua Caliente, Augustine, Cabazon, Cahuilla, Los Coyotes, Morongo, Ramona, Santa Rosa, and Torres Martinez.¹⁰⁶ In Riverside County, the Service has proposed as critical habitat 1,203 acres of the Cahuilla Band of Indians Tribal lands in the Tule Peak / Silverado Core Occurrence Complex that contains proposed Unit 6.¹⁰⁷ The Campo reservation includes 3,156 acres within proposed Unit 9 (La Posta / Campo) in San Diego County. The Campo Reservation was established in 1893 and is governed under the authority of a general council comprised of all adult tribe members.¹⁰⁸
176. Socioeconomic data, provided in Exhibit 6-1, demonstrate the economic vulnerability of the Tribes. The Cahuilla Band of Indians and the Campo Band of Kumeyaay Indians have small populations of 330 and 372 people, respectively.¹⁰⁹ The Campo Band of Indians' unemployment rate is almost twice that of San Diego County, while the median household income is less than half of that of San Diego County. The Cahuilla Band of Indians' median household income is lower than that of Riverside County.

EXHIBIT 6-1 COMPARISON OF COUNTY AND TRIBAL SOCIOECONOMIC INDICATORS

ENTITY	POPULATION	PERCENT IN LABOR FORCE AND UNEMPLOYED	MEDIAN HOUSEHOLD INCOME	PERCENT BELOW POVERTY LEVEL	PERCENT BELOW HALF OF THE POVERTY LEVEL	MEDIAN VALUE OF OWNER OCCUPIED HOMES
Riverside County	1,545,387	4.36%	42,887	14.17%	5.92%	\$146,500
Cahuilla Reservation (Riverside County)	168	2.80%	36,364	36.90%	15.48%	\$95,000
San Diego County	2,813,833	3.61%	47,067	12.43%	5.31%	\$227,200
Campo Reservation (San Diego County)	372	6.44%	20,000	41.60%	28.93%	\$78,900

¹⁰⁶ Wikipedia contributors. Cahuilla. Wikipedia, The Free Encyclopedia. May 3, 2008, 03:34 UTC. Available at: <http://en.wikipedia.org/w/index.php?title=Cahuilla&oldid=209837965>. Accessed June 9, 2008.

¹⁰⁷ U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Quino Checkerspot Butterfly (*Euphydras editha quino*); Proposed Rule, 73 *FR* 3351, January 17, 2008.

¹⁰⁸ Campo Kumeyaay Nation. Leadership. Webpage last accessed at <http://www.campo-nsn.gov/leaders.html> on June 09, 2008.

¹⁰⁹ Cahuilla Tribal information provided via written communication September 19, 2008; note that less than 200 tribal members actually reside on the reservation.

177. The proportion of people below the poverty level is substantially higher for the Tribes relative to Riverside and San Diego counties. An even larger disparity concerns the most impoverished. The percentage of people below 50 percent of the poverty line on the Cahuilla reservation is approximately three times that of Riverside County, and the percentage of people below 50 percent of the poverty level on the Campo reservation is more than five times that of San Diego County. Correspondingly for the Tribes, the median value of owner occupied houses is less than half of the median value for owner occupied houses in the Counties where the reservations are located.
178. While the Tribal governments are expected to provide its residents with services similar to those provided by surrounding counties, Tribal governments have substantially fewer means to do so. In 2006, San Diego County was estimated to have a population of 2.9 million and an operating budget of approximately \$898 million.¹¹⁰ The Campo Band of Kumeyaay Indians currently operates on less than \$5 million annually and provides a substantially greater array of supportive services.¹¹¹ County governments can impose taxes and assess fees to generate government revenue. Tribal governments do not have taxing authority. For this reason, the Tribes must generate the majority of government revenues from fees on new business developments.¹¹² This is especially problematic for the Tribes as they have limited reservation lands available to develop. Placing further restrictions on the business development rights in Tribal lands would reduce the Tribal government's ability to raise money through this means and thereby limit the capacity to provide services to its citizens. The location of the Campo Band of Kumeyaay Indians along the U.S.-Mexico border also makes them vulnerable to potential development restrictions from immigration policy interpretation and implementation.¹¹³

6.2 RESIDENTIAL DEVELOPMENT IMPACTS

179. Future impacts related to residential development on Tribal lands are estimated using the following five steps.¹¹⁴
- **Step 1: Forecast development.** Development is forecast according to projections provided by the Campo Band of Kumeyaay Indians. According to the Tribe, 200 houses are expected to be constructed on its land within the area of proposed critical habitat between 2008 and 2030. The gross density for a single family home (including associated roads, utilities, and fire breaks) is approximately seven acres.¹¹⁵ Each new house is forecast to have an average of one quarter mile of

¹¹⁰ San Diego County population provided by U.S. Census, available at:

<http://quickfacts.census.gov/qfd/states/06/06073.html>; San Diego County annual operating budget is the balance of the General Operating Fund, as provided in the 2006 Comprehensive Annual Financial Report, available at: http://www.sdcounty.ca.gov/auditor/annual_report06/pdf/cafr0506bfs.pdf.

¹¹¹ Personal communication, Michael Connolly, Campo Band of Kumeyaay Indians, August 25, 2008.

¹¹² Written communication, Michael Connolly, Campo Band of Kumeyaay Indians, May 20, 2008.

¹¹³ Ibid.

¹¹⁴ No analysis of development impacts to the Cahuilla Band of Indians is possible at this time. Please see Section 6.4.

¹¹⁵ Written communication from Michael Connolly, Campo Band of Kumeyaay Indians, May 20, 2008.

road built as infrastructure.¹¹⁶ There is no residential development forecast within the proposed critical habitat on the Cahuilla Band of Indians Tribal land, therefore no impacts are estimated.¹¹⁷

- **Step 2: Identify whether the butterfly will likely be detected in the unit.** To assess whether the butterfly will be detected at future project sites within proposed critical habitat, the analysis applies the percentage described in Chapter 4.
 - **Step 3: Identify whether a Federal nexus exists.** The vast majority of development projected on Campo Band of Kumeyaay Indian lands in proposed critical habitat is expected to require consultation.¹¹⁸ A Federal nexus will be triggered through consultation with the Bureau of Indian Affairs (BIA), which has oversight over tribal activities
 - **Step 4: Distinguish between incremental and baseline impacts.** Absent critical habitat, BIA is unlikely to initiate section 7 consultation with the Service for projects where no butterflies are present. Therefore, in areas where butterflies are not detected, consultations and the resulting project modifications are attributed to the designation. For projects in areas where the butterfly is detected, section 7 consultations are anticipated even without critical habitat. Therefore, the majority of the costs associated with these latter consultations are attributed to the baseline; administrative costs associated with consideration of the adverse modification standard are the only incremental costs.
 - **Step 5: Estimate impacts.** Impacts of development on Campo Band of Kumeyaay Indian lands are expected to be compensated through purchase and management of land outside of critical habitat at a ratio of 2.5:1, which is the average compensation ratio from recent consultations.¹¹⁹ The cost of compensation land within the Reservation is approximately \$6,000 per acre.¹²⁰ There is also an additional ¼ mile of road that is forecast to be built for each new house.¹²¹ This results in additional 2/3 of an acre per house to be mitigated.
180. The baseline and incremental impacts associated with compensation for residential development conservation offsets are presented in Exhibit 6-2.
181. To estimate the administrative costs of section 7 consultations, the analysis forecasts the number of projects that could take place in the 2,000 acres slated for development. The analysis relies on the range of average project sizes presented in Chapter 4. Specifically, the low scenario assumes that development takes place in 100 acre projects and the high scenario assumes that development takes place in 75 acre projects. The predicted number

¹¹⁶ Personal communication, Michael Connolly, Campo Kumeyaay Nation, August 25, 2008.

¹¹⁷ Written communication from Mary Jupp, Environmental Officer, Cahuilla Band of Indians, September 18, 2008.

¹¹⁸ Ibid. The percentage of projects with consultation is estimated at more than 90 percent.

¹¹⁹ For a detailed discussion of the basis for this compensation ratio, see Chapter 4.

¹²⁰ Written communication from Michael Connolly, Campo Band of Kumeyaay Indians, May 20, 2008.

¹²¹ Personal communication from Michael Connolly, Campo Band of Kumeyaay Indians, August 25, 2008.

of consultations is equal to the projected number of development acres divided by 100 acres and 75 acres, respectively.

EXHIBIT 6-2 PROJECTED IMPACTS OF DEVELOPMENT COMPENSATION TO THE CAMPO BAND OF KUMEYAAY INDIANS (SEVEN PERCENT DISCOUNT RATE, 2008 DOLLARS)

UNIT	FORECAST HOUSING UNITS	FORECAST DEVELOPMENT ACRES	FORECAST COMPENSATION ACRES	COST OF COMPENSATION PER ACRE	FORECAST PRESENT VALUE IMPACTS FROM COMPENSATION (2008 - 2030)	ANNUALIZED IMPACTS
BASELINE						
9. La Posta/Campo ¹	171	1,310	2,279 to 1,678	\$6,000	\$7,170,000 to \$5,280,000	\$594,000 to \$438,000
INCREMENTAL						
9. La Posta/Campo	29	224	1,556 to 2,157	\$6,000	\$4,900,000 to \$6,790,000	\$406,000 to \$563,000

Notes:

- (1) The range of forecasts for baseline impacts appear confusing, since the forecast impacts in the low scenario are greater than the forecast impacts in the high scenario. Total project modification impacts are divided between incremental and baseline impacts. The primary low and high impacts are assigned to the incremental impacts. The low forecasts of baseline impacts are the residuals left over from subtracting the incremental impacts from the total impacts.
- (2) According to the Campo Band of Kumeyaay Indians, 200 houses are projected to be built between 2008 and 2030 in areas proposed for critical habitat designation. The gross density of housing to accommodate fire breaks and future development is approximately seven acres per house. The total forecast acreage also includes ¼ mile of road per house.
- (3) The compensation ratio of 2.5:1 was obtained from a review of relevant biological opinions.
- (4) Lacking more specific information regarding the timing of future development projects, development activity is assumed to be spread uniformly through the time period of analysis (2008 - 2030 for development).

Sources:

- (2) Housing growth forecasts based on written communication from Michael Connolly, Campo Band of Kumeyaay Indians, May 20, 2008.
- (3) Cost of compensation land based on written communication from Michael Connolly, Campo Band of Kumeyaay Indians, May 20, 2008.

182. Administrative costs for consultations in areas of habitat where the butterfly is not detected include the costs of considering whether the project will adversely modify critical habitat and are attributed to the designation. Consultations in critical habitat where the butterfly is detected will consider both jeopardy and adverse modification. Because the consultations are likely to occur even in the absence of critical habitat, most of the administrative costs are attributed to the baseline. Only the incremental costs of considering adverse modification are attributed to the proposed rule. The predicted number of consultations and the net present value of their impacts are presented in Exhibit 6-3.

EXHIBIT 6-3 PROJECTED IMPACTS OF DEVELOPMENT CONSULTATIONS TO THE CAMPO BAND OF KUMEYAAY INDIANS (SEVEN PERCENT DISCOUNT RATE, 2008 DOLLARS)

UNIT	FORECAST NEW CONSULTATIONS	CONSULTATIONS ADDING CONSIDERATION OF ADVERSE MODIFICATION	FORECAST PRESENT VALUE IMPACTS (2008 - 2030)	ANNUALIZED IMPACTS
BASELINE				
9. La Posta/Campo	9		\$71,400	\$5,920
INCREMENTAL				
9. La Posta/Campo	6-12	9	\$71,300 to \$111,000	\$5,900 to \$9,220
Notes:				
(1) Forecast consultations are calculated by dividing the projected acres of development by 100 acres in the low scenario and 75 acres in the high scenario.				
(2) Costs per consultation are presented in Chapter 2.				
(3) Lacking more specific information regarding the timing of future development projects, consultation activity is assumed to occur at regular intervals throughout the time period of analysis (2008 - 2030).				

183. Projects are assumed to experience a delay of six months during the consultation process based on the average delay from the consultation history (see Chapter 4). Development delay impacts are calculated in the same way as described in Chapter 4. The analysis assumes that the value of undeveloped acres is \$6,000 per acre based on information provided by the Tribe.¹²² The opportunity cost of the money tied up in the ownership of the lot that is not developed due to the delay is calculated based on a market rate of return on investment of seven percent, for the period of delay. The delay impacts are presented in Exhibit 6-4.

¹²² Written communication from Michael Connolly, Campo Band of Kumeyaay Indians, May 20, 2008.

EXHIBIT 6-4 PROJECTED IMPACTS OF DEVELOPMENT DELAY TO THE CAMPO BAND OF KUMEYAAY INDIANS (SEVEN PERCENT DISCOUNT RATE, 2008 DOLLARS)

UNIT	FORECAST DELAY IMPACTS (2008 - 2030)	ANNUALIZED IMPACTS
BASELINE		
9. La Posta/Campo ¹	\$91,600 to \$67,500	\$7,600 to \$5,590
INCREMENTAL		
9. La Posta/Campo	\$62,600 to \$86,700	\$5,200 to \$7,190
Notes:		
<p>(1) The range of forecasts for baseline impacts appear confusing, since the forecast impacts in the low scenario are greater than the forecast impacts in the high scenario. Total project modification impacts are divided between incremental and baseline impacts. The primary low and high impacts are assigned to the incremental impacts. The low forecasts of baseline impacts are the residuals left over from subtracting the incremental impacts from the total impacts.</p> <p>(2) Acres of land to be developed are provided in Exhibit 6-2. The value per acre is assumed to be \$6,000 based on information provided by the Campo Band of Kumeyaay Indians. The opportunity cost of capital is assumed to equal to seven percent.</p> <p>(3) Lacking more specific information, delay costs are assumed to be spread uniformly throughout the time period of the analysis (2008 - 2030).</p>		

6.3 NON-RESIDENTIAL DEVELOPMENT IMPACTS

184. The area of the Campo reservation that overlaps with the proposed critical habitat is partially zoned for industrial use. The Tribe has several planned projects including: a municipal solid waste landfill and recycling center; a tourist rail depot; a solar energy facility; and a wind energy facility. Only the details of the landfill and wind energy projects are available at this time. These projects and their associated economic impacts are discussed below.
185. The Campo Band of Kumeyaay Indians completed a Biological Assessment and in 2006 began consultation with the Service for the Campo Solid Waste Disposal Facility Project. The total pre-designation costs are for the consultation that took place in 2006.
186. The proposed project would consist of a landfill waste disposal area, a well field area, an access road, and other support facilities. Approximately 480 acres of lease area are proposed for landfill development to receive solid waste. The landfill area would be developed in approximately 19 phases; an area ranging in size from 15 to 30 acres would be constructed during each phase. The landfill is expected to take approximately 30 years to fill.¹²³
187. Butterfly conservation efforts for the landfill project are currently under consideration. The original proposal to set aside 640 acres for approximately 30 years to offset the impacts of construction and operation of the landfill has been reduced to 480 acres (the

¹²³ Biological Assessment for the Campo Indian Reservation Solid Waste Disposal Facility Project, prepared by Science Applications International Corporation, submitted by the Campo Band of Kumeyaay Indian tribe to the Service, June, 2006.

landfill will disturb 400 acres). The Tribe has proposed an adaptive management re-vegetation plan for restoration of the 19 phases of the landfill in order to create habitat for the butterfly. The Campo Band of Kumeyaay Indians would employ a project biologist, conduct annual monitoring, store and preserve native topsoil from the site, and develop and operate a native seed bank.¹²⁴

188. It is not clear when construction of the landfill will commence. Moreover, consultation with the Service has not concluded and the compensation levels for the effects of the landfill on critical habitat may change. The landfill offset is anticipated to occur in 2010. It is also likely that a consultation would be initiated to address proposed critical habitat specifically after critical habitat is designated.
189. Cost estimates provided by the Tribe are used to estimate impacts for conservation efforts related to the landfill. These costs include: an annual cost of \$50,000 for all future years to conduct surveys; an additional cost of \$50,000 annually to monitor project effects; and an annual cost of \$125,000 to enforce regulations.¹²⁵ To estimate the value of the land set aside, this analysis applies the value of \$6,000 per acre provided by the Tribe for the residential development analysis.¹²⁶ Total potential impacts to the Campo Band of Kumeyaay Indians for landfill project activities are shown in Exhibit 6-5. None of these forecast impacts are incremental because the consultation began before the proposal for critical habitat designation, and there is almost always a Federal nexus for consultation on activities within reservations due to BIA involvement.¹²⁷ However, the anticipated consultation in 2009 to address critical habitat concerns will be incremental.
190. The Tribe also plans to construct a wind energy facility. Construction is expected to begin within the next three years and to be completed within five to ten years. The wind farm project overlaps the proposed critical habitat designation. As proposed, the project will cover a corridor approximately 2.5 miles long with a three hundred foot clearance on either side. The wind farm is expected to disturb approximately 182 acres of the proposed critical habitat.¹²⁸ Additionally, this project would necessitate construction of access roads, which the tribe estimates will disturb another 10 to 20 acres of the proposed critical habitat (this analysis assumes that a total of 197 = (182 + 15) acres will be disturbed).
191. This analysis assumes that a formal consultation will take place in 2009 on effects of the wind energy project on the butterfly. The Campo tribe will likely have to hire a biologist to conduct surveys of the proposed project area. The cost of hiring a biologist is estimated to be equal to the cost estimated by the tribe to hire a biologist for its landfill. Surveys for larvae and adult are assumed to be completed in one year, 2010, between the end of

¹²⁴ Written communication from Michael Connolly, Campo Kumeyaay Nation, May 20, 2008.

¹²⁵ Written communication from H. Paul Cuero, Jr., Chairman, Campo Kumeyaay Nation, May 20, 2008.

¹²⁶ Ibid.

¹²⁷ 90 percent of development projects are assumed to go through the consultation process. Personal communication from Michael Connolly, Campo Kumeyaay Nation, August 25, 2008. The long history of frequent consultation on development projects is unlikely to be affected by critical habitat designation; consultation is likely to continue to occur in most cases as it has in the past.

¹²⁸ Written communication from Michael Connolly, Campo Kumeyaay Nation, September 11 and September 16, 2008.

January and mid-May. Due to the large scale of the project it is anticipated that the Service will consult with the Tribe to address both effects on the butterfly and to the area of proposed critical habitat that will be disturbed. The Service has indicated that given the proposed location of the project, it would recommend compensation for impacts to proposed critical habitat at a ratio similar to that recommended in other development projects (2.5 acres of compensation for every acre disturbed). It is assumed that a total of 492.5 acres of compensation land will have to be purchased. The cost of compensation land is estimated by the tribe as approximately \$6,000 per acre. The offset land purchases are assumed to be made in equal amounts over the eight years necessary to complete the project (2010-2017).¹²⁹ The impacts of the proposed wind energy project are presented below.

EXHIBIT 6-5 POTENTIAL IMPACTS TO THE CAMPO BAND OF KUMEYAAY INDIANS DUE TO THE WIND ENERGY PROJECT (UNDISCOUNTED, 2009-2030)

CONSERVATION EFFORT	TOTAL IMPACTS
BASELINE	
Administrative cost of consultation to address jeopardy (2009)	\$15,000
Set aside 492.5 acres of preserve land (2010-2017)	\$2,955,000
Hire biologist to conduct surveys (2010)	\$50,000
INCREMENTAL	
Administrative cost of consultation to address adverse modification (2009)	\$5,000

6.4 ECONOMIC IMPACT TO CAHUILLA BAND OF INDIANS

192. The Cahuilla Reservation is located in southeastern Riverside County and encompasses 19,000 acres of rolling hills in the Cahuilla/Anza Valley. The governing body of the reservation is the Tribal Council, which oversees the administration of Tribal health, housing, environmental protection, business and education.¹³⁰ Economic activities on the reservation include agriculture, cattle grazing and various tribal businesses including a soil remediation facility, motor cross track, and a casino.¹³¹ The proposed critical habitat overlaps with a portion of the 2,000 acres zoned by the Tribe for economic development; however, no projects are currently planned for this area, so no estimate of future impacts can be made at this time.¹³² The only expected activity in this area is fire management via fuel breaks. The Cahuilla Band maintains fuel breaks with a 200 foot clearance along the southern boundary of the reservation, and along the 2,000 acres set aside for

¹²⁹ The project is forecast to take five to ten years to complete. Written communication from Mike Connolly, Campo Band of Kumeyaay Indians, September 16, 2008. Eight years is used as an average.

¹³⁰ Written communication, Cahuilla Tribal Protection Office. September 19, 2008.

¹³¹ Ibid.

¹³² Ibid.

economic development.¹³³ There is not publicly available information to assess butterfly conservation costs for these fire-breaks.

193. While the proposed critical habitat also encompasses seven Tribal residences, no information on future residential development was provided by the Cahuilla Band. Therefore, residential development was forecast in Cahuilla Band of Indian lands using the revised CURBA model described in Chapter 4 and development projections provided by the Southern California Association of Governments (SCAG). The model results indicate that growth is not expected to exceed one additional house and less than two additional residents in the area of critical habitat owned by the Cahuilla Band of Indians between now and 2030. According to the Western Riverside Council of Governments (WRCOG) GIS data on future road projects, no road construction is forecast in this area.¹³⁴ Therefore, no impacts are estimated for the Cahuilla Band of Indians.
194. While no impacts can be quantified, it should be emphasized that the Cahuilla Band of Indians, like the Campo Band of Kumeyaay Indians, must rely on fees of development within limited Tribal lands to generate government revenue. While there are no development plans for the Cahuilla Band of Indians that can be specified at this time, potential critical habitat based restrictions on development could result in additional constraints to limited Tribal resources.

6.5 TOTAL PRE-DESIGNATION BASELINE IMPACTS

195. Pre-designation impacts for the Campo Band of Kumeyaay Indians result from the 2006 consultation concerning development of the landfill project. The Tribe did not provide information about past residential development projects affected by the listing of the butterfly. Because no information is readily-available about impacts to the Cahuilla Band of Indians, no pre-designation impacts are quantified.
196. Total present value impacts are \$17,200 (\$2,290 annualized) assuming a seven percent discount rate. These impacts are all for the land on the Campo Reservation within the LaPosta/Campo unit (Unit 9).

6.6 TOTAL POST-DESIGNATION BASELINE IMPACTS

197. The post-designation baseline impacts quantified in Exhibit 6-6 are expected to be borne by the Campo Band of Kumeyaay Indians as a result of development-related projects. All quantified baseline impacts are expected to occur in areas in Unit 9 (La Posta/Campo) that are not considered for exclusion. To the extent that the forecasts provided by the Campo Band of Kumeyaay Indians are accurate assessments of costs, the economic analysis should have valid results for that reservation.

¹³³ Ibid.

¹³⁴ WRCOG data on the location of future roads received from Program Manager Western Riverside Council of Governments, May 13, 2008.

EXHIBIT 6-6 TOTAL POST-DESIGNATION BASELINE IMPACTS TO TRIBES
(2008 - 2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	TOTAL PRESENT VALUE LOW ESTIMATE	TOTAL PRESENT VALUE HIGH ESTIMATE	ANNUALIZED IMPACTS LOW ESTIMATE	ANNUALIZED IMPACTS HIGH ESTIMATE
6	Tule Peak	\$0	\$0	\$0	\$0
9	La Posta/Campo ¹	\$14,700,000	\$12,800,000	\$1,220,000	\$1,060,000
TOTAL		\$14,700,000	\$12,800,000	\$1,220,000	\$1,060,000

Note:

(1) The range of forecasts for baseline impacts appear confusing, since the forecast impacts in the low scenario are greater than the forecast impacts in the high scenario. Total project modification impacts are divided between incremental and baseline impacts. The primary low and high impacts are assigned to the incremental impacts. The low forecasts of baseline impacts are the residuals left over from subtracting the incremental impacts from the total impacts.

(2) These totals incorporate the high end administrative costs of consultation.

6.7 TOTAL INCREMENTAL IMPACTS

198. The incremental impacts quantified in Exhibit 6-7 are anticipated to be incurred by the Campo Band of Kumeyaay Indians as a result of the impact of critical habitat designation on development projects. All incremental impacts are expected to occur in areas that are not under consideration for exclusion in Unit 9 (La Posta/Campo).

EXHIBIT 6-7 TOTAL POST-DESIGNATION INCREMENTAL IMPACTS TO TRIBES
(2008 - 2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	TOTAL PRESENT VALUE LOW ESTIMATE	TOTAL PRESENT VALUE HIGH ESTIMATE	ANNUALIZED IMPACTS LOW ESTIMATE	ANNUALIZED IMPACTS HIGH ESTIMATE
6	Tule Peak	\$0	\$0	\$0	\$0
9	La Posta/Campo	\$5,020,000	\$6,990,000	\$418,000	\$580,000
TOTAL		\$5,020,000	\$6,990,000	\$418,000	\$580,000

Note:

These totals incorporate the high end administrative costs of consultation.

6.8 KEY SOURCES OF UNCERTAINTY

199. The key source of uncertainty in this analysis is the lack of development plans for the Cahuilla Band of Indians. No economic impacts could be estimated for the Cahuilla Band of Indians because the Tribal lands proposed for designation are sparsely inhabited and have no formulated development plans. However, as mentioned above, any potential restrictions on development land and Tribal abilities to generate revenues through development fees would act to reduce the opportunities available to the Tribe.

CHAPTER 7 | POTENTIAL ECONOMIC IMPACTS RELATED TO HABITAT MANAGEMENT AND OTHER ACTIVITIES

200. This Chapter quantifies impacts from species and habitat management activities benefiting the butterfly undertaken by Federal, State, and local agencies, and non-governmental organizations. The direct economic impacts associated with these efforts stem from implementation of land and species management plans and monitoring for the butterfly in anticipation of land use projects. The Chapter first addresses habitat management costs from the two operational HCPs within the proposed critical habitat, the Western Riverside County MSHCP and the Chula Vista Sub-area Plan. The rest of the Chapter focuses on actions taken by Federal and State entities. The Federal agencies discussed include BLM, the U.S. Forest Service (USFS), U.S. Customs and Border Protection (CBP), and the U.S. Navy. State agencies include the California Department of Fish and Game (CDFG) and the California State Lands Commission (CSLC). The only private land manager discussed is the Center for Natural Lands Management (CNLM).
201. Following a discussion of HCP impacts, the Chapter is organized by land use activity and/or threat, and then by the agency or organization conducting the activities, in the following order: (1) habitat management; (2) grazing; (3) mining; and (4) climate and atmospheric pollution, including the potential impacts of climate change, increased atmospheric carbon dioxide, and nitrogen deposition. It concludes with a summary of past and future baseline impacts, and future incremental impacts of these activities.
- 7.1 HABITAT MANAGEMENT BY HCPS**
202. The HCPs discussed in Chapter 3 promote conservation through project modifications that affect residential and non-residential development, and through habitat conservation. While many of the HCP costs result from conservation project modifications that concern development, HCP operational and management costs are most appropriately considered in terms of their place within habitat management. Costs for the habitat management portion of the HCPs are available for the MSHCP and the Chula Vista Subarea Plan only; the Quino Amendment to the San Diego County MSCP has not been passed; while the impact of development project modifications are available, habitat management cost estimates cannot be forecast without better data.

7.1.1 MSHCP HABITAT MANAGEMENT

203. In addition to project modifications to development such as avoidance and off-set purchases, the MSHCP also promotes conservation through species management and monitoring. The Plan specifically outlines these activities for the butterfly as follows:

The condition of Quino checkerspot butterfly habitat within each Core Area will be evaluated through an adaptive program which maintains and/or enhances Quino checkerspot butterfly habitat to increase the value of the habitat and viability of the butterfly. This Adaptive Management program will assess the efficacy of various management methods which might enhance unoccupied habitat, preserve habitat quality in occupied areas, or increase connectivity among habitats. This strategy will also include annual documentation of the Butterfly's distribution within the Core Areas. Other management activities will focus on non-native species, farming, grazing, off-road vehicles and human collection. Management for the butterfly is overseen by Reserve Managers who are selected by the Reserve Management Oversight Committee to manage each reserve area.¹³⁵

The costs of these management activities are estimated using the information provided in the MSHCP budget.¹³⁶ The total cost per year is determined using the annual management, monitoring, and public education costs provided in the plan's budget; the cost of the adaptive management fund is also included. These costs are then multiplied by the percent of critical habitat which falls under the plan area, or approximately three percent, to determine the total costs that are relevant to the proposed critical habitat. The total present value impact of these activities from 2002 to 2030 is \$1.4 million, assuming a seven percent discount rate.¹³⁷

7.1.2 THE CHULA VISTA SUB-AREA PLAN AND HABITAT MANAGEMENT

204. The City of Chula Vista developed a conservation program for the butterfly as part of its subarea plan. This program includes conservation measures that mitigate impacts to the species from a variety of activities within the City of Chula Vista. The program also ensures long-term protection and recovery of the butterfly by preserving the area located within the 2002 designated critical habitat, maintaining connectivity between key habitat linkages, and managing the preserve areas for benefit of the species. Other conservation measures specified in the Chula Vista Subarea Plan include restoration and enhancement of butterfly habitat.¹³⁸ The fact that the plan refers to the 2001 draft *Recovery Plan* for the butterfly suggests that this species would have been included in the plan regardless of the designation of critical habitat in 2002. While the designation may have influenced the

¹³⁵ For greater detail, including specific geographic information, see Section 5.2.1 and Table 5-1 of the MSHCP.

¹³⁶ Western Riverside County MSHCP, APPENDIX B-02A - 25 Year Budget. Available at: http://www.rctlma.org/mshcp/volume1/Appendix_B-02Aiii.html

¹³⁷ Note that the costs for plan management are excluded because these are duplicative with mitigation fees paid under this plan. For further discussion of mitigation fees, see Chapter 4.

¹³⁸ Chula Vista Subarea Plan 2003, Section 4, p. 41. As cited in 73 FR 3347.

boundaries of the preserve areas, the Chula Vista subarea plan is unlikely to be revised based on this proposed revision to critical habitat. Therefore, impacts associated with this plan are attributed to the baseline.

205. Approximately 92 percent or 1,681 acres of proposed critical habitat in Unit 8 (Otay) will be preserved by the City of Chula Vista in perpetuity. The preserve will be adaptively managed according to objectives established by the plan, which include long-term goals of species preservation, habitat management and restoration, species monitoring, and general mitigation and avoidance of impacts to endangered species and their habitats.¹³⁹ Costs for these management activities are estimated using information provided in the plan.¹⁴⁰ Per-acre cost figures for preserve maintenance and monitoring, biological monitoring, and program administration are multiplied by the number of acres of proposed critical habitat within the boundaries of the Chula Vista Subarea to provide a total cost of approximately \$110,000 per year between 2003 and 2030.¹⁴¹

7.2 HABITAT MANAGEMENT BY AGENCIES AND ORGANIZATIONS

206. Federal, State, and private entities manage the relevant study area for several purposes. A summary of the agencies managing land within the proposed critical habitat is provided in Exhibit 7-1. In general, the main activities conducted that affect or are affected by butterfly conservation are fire and fuels management, invasive species control, and enforcement activity to counteract illegal off-road vehicle use. These management activities and associated costs will be discussed in more depth in the following sections.

7.2.1 FIRE AND FUELS MANAGEMENT AND THE WILDFIRES OF 2007

207. Prior to discussing land management activities in the proposed critical habitat, an explanation of common fire management practices and recent current events is necessary to provide context for this analysis. In general, the primary federal agencies practicing fire and fuels management are BLM and the USFS. Fire-related management activities include construction of fuel breaks for containment of fires and controlled burns for management of habitat or fuels reduction.¹⁴² These activities are conducted for general maintenance purposes and to protect human life and property. Prior to conducting planned fire projects, surveys for the butterfly and its habitat are often conducted in areas of known occupation or in critical habitat. Therefore, the costs incurred by agencies for protection of the butterfly and its habitat are the costs of these surveys and associated administrative costs, rather than total costs of the fire projects themselves.

¹³⁹ 73 FR 3348.

¹⁴⁰ Chula Vista Subarea Plan 2003, p. 8-3.

¹⁴¹ Note that values provided in the plan were originally reported in 1996 dollars and have been adjusted for inflation to 2008 dollars using the Consumer Price Index.

¹⁴² Personal communication, Joyce Schlacter, San Diego County Biologist, BLM Palm Springs - South Coast Field Office, May 27, 2008.

EXHIBIT 7-1 HABITAT MANAGEMENT ACTIVITIES, BY AGENCY/ORGANIZATION

AGENCY	UNITS	MANAGEMENT ACTIVITY
BLM	2, 3, 4, 5, 6, 7, 8, 9	Fire and fuels management
		ORV use
		Invasive species control
USFS (Cleveland National Forest and San Bernardino National Forest)	5, 7	Fire and fuels management
Navy	9	Invasive species control
CDFG	2, 6, 8	Fire and fuels management
		ORV use
		Invasive species control
US FWS (San Diego National Wildlife Refuge)	8	Species monitoring
		Habitat restoration
CNLM	1, 2, 4	Monitoring
		Weed management
		Patrolling
Riverside County	2	Invasive species control
CSLC	7	None
U.S. CBP	8, 9, 10	None

208. Following the Southern California wildfires of 2007, Federal agencies allocated additional funding for fire projects.¹⁴³ Fire prevention and management has also been identified as a top priority for the State by Governor Arnold Schwarzenegger, who signed an Executive Order May 9, 2008 that provided additional resources and support for firefighting in 2008.¹⁴⁴ The increased funding for fire projects may lead to greater spending on butterfly surveys in certain critical habitat units. Further detail on the impacts of increased fire spending by individual agencies in proposed critical habitat units are provided below.

7.2.2 BUREAU OF LAND MANAGEMENT (UNITS 6, 8, AND 9)

209. The BLM's South Coast Field Office in Palm Springs, California, manages approximately 12,565 acres of proposed critical habitat in San Diego and Riverside counties.¹⁴⁵ Under the Federal Land Policy Management Act of 1976, the BLM developed the South Coast Regional Management Plan (RMP) in 1994, which covers

¹⁴³ Ibid.

¹⁴⁴ "Governor Schwarzenegger Takes Action to Bolster State's Firefighting Resources", as viewed at: <http://gov.ca.gov/index.php?/press-release/9545/>. Accessed June 10, 2008.

¹⁴⁵ U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Quino Checkerspot Butterfly (*Euphydryas editha quino*); Proposed Rule, 73 *FR* 3340, January 17, 2008.

300,000 acres of publicly administered lands.¹⁴⁶ The RMP provides broad land use management objectives, assigns land use classifications to all areas and defines Areas of Critical Environmental Concern where additional or special management is deemed appropriate. The RMP is currently being revised to better align with the Western Riverside MSHCP and afford adequate protection for threatened and endangered species listed after the original South Coast RMP was completed.¹⁴⁷

210. Fire safety and related management activities are currently the highest management priority of BLM.^{148,149} Prior to conducting such fire management activities as fuel break construction, controlled burns, and fuels reduction, BLM conducts surveys for the butterfly. Following listing of the species in 1997, through 2007, approximately two surveys per year were conducted in proposed critical habitat Units 6, 8, and 9 in San Diego County at a cost of \$20,000 per year.¹⁵⁰ This cost estimate includes administrative time, survey costs, and other related project costs.¹⁵¹
211. Increased fire frequency, and in particular the extensive fires in 2007, caused an increase in current spending on fuels management projects by BLM. However, most of the projects occurring in 2008 and planned for the future are not within the proposed critical habitat.¹⁵² There are two fuel breaks planned for completion in 2008, the Shockey Truck Fuel Break, adjacent to Unit 9 and the Beauty Mountain Fuel Break, which is southeast of Unit 6.¹⁵³ Butterfly surveys for these fuel breaks will cost approximately \$12,000.¹⁵⁴ In 2009, BLM will work on the International Fuel break, which abuts units 8 and 9. The cost for butterfly surveys prior to this work is expected to be \$9,000.¹⁵⁵
212. Other costs incurred related to fire management include administrative time and consultations with the Service for planned fuel breaks. BLM consulted formally with the Service for construction of the International Fuel Break between 2000 and 2001, at a total cost of approximately \$30,000.¹⁵⁶ Another formal consultation is expected to occur in

¹⁴⁶ Federal Land Policy and Management Act, Sec. 601. [43 U.S.C. 1781].

¹⁴⁷ Personal communication, Mark Masser, Riverside County Biologist, BLM Palm Springs - South Coast Field Office, May 28, 2008.

¹⁴⁸ Personal communication, Holly Roberts, Associate Field Manger, BLM Palm Springs - South Coast Field Office, May 28, 2008.

¹⁴⁹ The construction of fire breaks by BLM discussed in Chapter 4 will occur if residential housing is constructed adjacent to BLM land. The fire management activities discussed in this chapter will occur regardless of whether new residential development occurs. The costs in this Chapter are additive with the costs presented in Chapter 4.

¹⁵⁰ Personal communication, Joyce Schlacter, San Diego County Biologist, BLM Palm Springs - South Coast Field Office, May 27, 2008.

¹⁵¹ Ibid.

¹⁵² Personal communication, James Gannon, South Coast Fuels Crew, BLM, July 28, 2008.

¹⁵³ Ibid.

¹⁵⁴ Ibid.

¹⁵⁵ Ibid.

¹⁵⁶ Ibid.

2008 for the Beauty Mountain fuel break at the same cost.¹⁵⁷ Due to an increase in projects planned in the near future, approximately four consultations are expected in 2009; the baseline cost of these consultations is \$19,000, with an incremental cost of \$9,250 for the consideration of critical habitat.¹⁵⁸ Following the completion of planned fuel breaks, the number of consultations is likely to decrease to two over the next 20 years for a total cost of \$40,000, \$10,000 of which is considered incremental.¹⁵⁹ Administrative costs are expected to remain constant at \$880 per year over this time period.

213. Planned fuel break projects are expected to decrease in the future; instead, fire management activity by BLM in Units 6, 8 and 9 is likely to consist of maintenance of established fuel breaks and monitoring for the butterfly and its host plants.¹⁶⁰ The costs associated with maintenance of the fuel breaks is not directly related to butterfly conservation or critical habitat designation and therefore are not included in this analysis. However, monitoring costs for the species and its host plants is included; monitoring by contractors in fuel breaks is estimated to cost \$96,000 for Units 6, 8, and 9 during the period 2009-2012.¹⁶¹ Research into prevention of invasion of non-native species in fuel breaks may also be conducted, although the cost of this research cannot be determined at this time.¹⁶² All of these impacts are attributed to the baseline because these projects are driven by fire management project modifications, and will be conducted regardless of the proposed habitat designation.¹⁶³
214. BLM lands within proposed critical habitat are also managed for recreation. The main impact of recreational activities to the butterfly and its habitat stems from ORV use, including legal use by CBP for immigration enforcement, and illegal use by recreational users. Roads frequented by ORV users traverse occurrence complexes in proposed critical habitat, and there is also evidence of ORV use outside of designated routes.¹⁶⁴
215. The cost of mitigating this threat to the butterfly is the expense of enforcement activities, which includes a range of activities such as maintaining signage, patrolling, ticketing, and court time.¹⁶⁵ The cost of enforcement in proposed critical habitat Units 8 and 9 for butterfly was approximately \$13,000 a year from 1997 to 2008; future enforcement costs

¹⁵⁷ Personal communication, Joyce Schlacter, Biologist, BLM, August 21, 2008.

¹⁵⁸ Personal communication, James Gannon, South Coast Fuels Crew, BLM, July 9, 2008.

¹⁵⁹ Ibid.

¹⁶⁰ Ibid.

¹⁶¹ Personal communication, James Gannon, South Coast Fuels Crew, BLM, July 28, 2008.

¹⁶² Personal communication, Joyce Schlacter, San Diego County Biologist, BLM Palm Springs -South Coast Field Office, May 29, 2008.

¹⁶³ Ibid. Note that another potential future cost relating to fire and fuels management is the clearance of BLM property abutting private land; this issue and associated costs are discussed in the Development Chapter.

¹⁶⁴ Personal communication, Joyce Schlacter, San Diego County Biologist, BLM Palm Springs - South Coast Field Office, May 27, 2008.

¹⁶⁵ Ibid.

are expected to remain constant.¹⁶⁶ Because enforcement activity would occur absent critical habitat, this cost is considered to be baseline.¹⁶⁷

216. There are currently no designated routes for use of ORVs in any Riverside County critical habitat, Units 2 through 7.¹⁶⁸ However, it is possible that illegal use of ORVs occurs in these units.¹⁶⁹ The designation of critical habitat is likely to elevate the need for increased enforcement activity to deal with this threat. However, the costs of enforcement against illegal ORV use relating directly to the butterfly and its habitat are difficult to identify relative to the overall costs, since enforcement includes protection of multiple threatened and endangered species.¹⁷⁰ Additionally, any increased enforcement expenditures are dependent on increased or reallocated funding. Other recreation in the area is minimal and restricted to casual use by residents; critical habitat in Riverside County is not a “tourist destination” that would provide significant recreational opportunities.¹⁷¹ No specific cost information is available for recreational impacts related to the butterfly and its habitat in Units 2 through 7.
217. While there is currently no invasive species management for enhancement of butterfly habitat, a weed control project is planned for 2009 to enhance existing habitat for the butterfly in Units 8 and 9.¹⁷² The estimated cost of this project is \$30,000; the cost is considered baseline since it would be conducted for conservation of the butterfly independent of critical habitat designation. BLM managers hope that invasive species management and habitat restoration expenditures will remain at this level into the future, although this is dependent on external funding, which may be difficult to predict.¹⁷³ Future expenditures are conservatively assumed to be constant over the next 20 years, but are considered baseline because they would be incurred regardless of critical habitat designation.
218. Ownership of a large portion of BLM land in Unit 9 (La Posta) is currently being transferred from BLM to the Navy Warfare Training Center. This withdrawal has important implications for critical habitat designation because lands owned, controlled, or subject to use by the Navy are exempted from critical habitat designation if there is an Integrated Natural Resources Management Plan (INRMP) in place for protection of the species.¹⁷⁴ Although the withdrawal approval is still pending, for the purposes of this

¹⁶⁶ Written communication, Joyce Schlacter, San Diego County Biologist, BLM Palm Springs -South Coast Field Office, June 3, 2008.

¹⁶⁷ Ibid.

¹⁶⁸ Personal communication, Mark Masser, Riverside County Biologist, Palm Springs - South Coast Field Office, May 28, 2008.

¹⁶⁹ Ibid.

¹⁷⁰ Personal communication, Holly Roberts, Associate Field Manger, Palm Springs - South Coast Field Office, May 28, 2008.

¹⁷¹ Personal communication, Mark Masser, Riverside County Biologist, Palm Springs - South Coast Field Office, May 28, 2008.

¹⁷² Ibid.

¹⁷³ Ibid.

¹⁷⁴ National Defense Authorization Act of 2004, as cited in written communication from Joyce Schlacter, BLM Palm Springs - South Coast Field Office, May 27, 2008.

analysis, the costs of the proposed INRMP would be used to estimate costs incurred related to conservation of the butterfly and its habitat. At this time, no cost information is available for the management of the butterfly and its habitat by the U.S. Navy.¹⁷⁵

219. The Carlsbad FWO also consults with BLM and the California Department of Transportation for the butterfly. One biologist spends approximately 2 weeks each year on consultations with these agencies, at a cost of \$2,464.¹⁷⁶ The same level of effort is expected over the next 23 years.

7.2.3 U.S. FOREST SERVICE (UNITS 5 AND 7)

220. Proposed critical habitat is contained within two national forests, Cleveland National Forest in San Diego County and San Bernardino National Forest in Riverside County. Cleveland National Forest comprises approximately 912 acres of proposed critical habitat in Unit 5; San Bernardino National Forest has 8,420 acres of proposed critical habitat located in Unit 7, along the southern boundary of the forest.¹⁷⁷ Both Forests are administered under the recently revised Southern California Land and Resource Management Plan (SCLRMP) developed by USFS.

Southern California Land and Resource Management Plan

221. USFS revised the regional plan for Southern California Forests in 2005. The revised forest management plan maps out the future management and strategy for four of southern California's national forests and includes individual plans with specific strategies for the Cleveland and San Bernardino National Forests.
222. In 2005, the USFS consulted with the Service on the SCLRMP. In its Biological Opinion, the Service determined that implementation of the SCLRMP is unlikely to jeopardize the butterfly or adversely modify its critical habitat.¹⁷⁸ The Service determined that impacts were likely to be minimal from motorized vehicles, other recreation, and minerals management. However, grazing was identified as a potential impact to the species and its habitat in San Bernardino National Forest. Details about management in each national forest are provided below; grazing is investigated in a subsequent section.
223. Land management in both forests is similar to BLM management practices, in that fire and fuels management is the primary focus. This is also the main area of consultation for USFS regarding conservation of the butterfly and its habitat. Consultations occur

¹⁷⁵ According to Kim O'Connors, Botany Program Manager for the Navy, the INRMP is currently being amended to include provisions for the Quino Checkerspot Butterfly. Specifically, a weed management plan is being developed consistent with the Recovery Plan through consultation with the Service, but costs of implementation have not yet been determined.

¹⁷⁶ Personal communication, Senior Biologist, Carlsbad Fish and Wildlife Office, May 21, 2008. See previous footnote for explanation of how this cost was estimated.

¹⁷⁷ U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Quino Checkerspot Butterfly (*Euphydryas editha quino*); Proposed Rule, 73 FR 3340, January 17, 2008.

¹⁷⁸ U.S. Fish and Wildlife Service. "Biological and Conference Opinions on the Revised Land Management Plans for the Four Southern California National Forests", Formal Consultation # 1-6-05-F-773.9, with the U.S. Forest Service, September 15, 2005.

whenever fuel breaks or controlled burn projects are undertaken in the Forest in occupied habitat. In addition, emergency consultations with the Service are required in case of wildfire and in particular, in relation to the use of flame retardant. Prior to completion of planned fuel and fire management projects, surveys for the butterfly and its habitat in the targeted area are required (some of these consultations take place after completion, if the fuel and fire management projects are in response to threats to human life). Cost information for butterfly surveys and related expenditures for fire and fuels management is summarized in Exhibit 7-2 and discussed in detail below.

EXHIBIT 7-2 ESTIMATES OF ANNUAL EXPENDITURES BY U.S. FOREST SERVICE (1998-2030)

FOREST	UNIT	ACTIVITY DESCRIPTION	YEAR	ESTIMATED ANNUAL COST	
				BASELINE	INCREMENTAL
San Bernardino	7	Butterfly surveys	2000-2006	\$3,400 ¹	-
		Administrative costs ²		\$20,000	-
		Butterfly surveys	2008	\$138,000	-
		Administrative costs ²		\$100,000	-
		Surveys and administration	2009-2030	\$75,000	-
Cleveland	5	General surveys (for butterfly habitat)	1998-2007	\$50,000	-
		Protocol surveys (for butterfly adults/larvae)	2001-2007	\$10,000	-
		Powerline consultation ³	2008 and 2018	\$15,000	\$5,000
		Survey/consultation firefighting ⁴	2008, 2013, 2018, 2023	\$10,000	-
		Fuels treatment project in proposed critical habitat-butterfly survey and administration costs	2010	\$100,000	-

Notes:

1. In total, 8 surveys were conducted from 2000-06 for a total cost of \$24,000, although the number of surveys conducted varied across the years. No cost information is available prior to 2000.

2. Administrative costs are based on time spent by San Bernardino National Forest staff and includes time spent consulting with the Service.

3. Consultation is expected once every ten years; these years have been chosen assuming a 2008 start and are not based on specifically planned dates for these consultations.

4. These years are also based on an expected frequency every 5 years, rather than specific information indicating that a fire event will occur in these years.

San Bernardino costs were provided by Anne Poopatanapong on May 8, 2008 through personal communication; Cleveland costs were provided by Kirsten Winter on May 5, 13, and 22 and July 2, via personal and written communication.

224. San Bernardino National Forest (Unit 7) conducted eight surveys between 2000 and 2006 at a cost of approximately \$3,000 per survey.¹⁷⁹ Including administrative time, SBNF spent an estimated total of \$164,000 (undiscounted) for these activities from 2000 to 2006.¹⁸⁰ Since 2006, there has been an increase in butterfly sightings, which has resulted in a substantial increase in administrative time spent on butterfly management, from approximately \$20,000 for each of the past 7 years, to \$100,000 in 2008. In addition, a large fuel break is currently in development.¹⁸¹ In preparation for this project, SBNF has contracted for surveys of the area at a cost of \$138,000 to be incurred in 2008.
225. Management in the Cleveland National Forest (Unit 5) includes two main components, protocol surveys and general surveys. Protocol surveys for the butterfly have been conducted in CNF since 2001 at a cost of roughly \$10,000 per year and are considered baseline. In addition, the Forest spends approximately \$50,000 per year on Quino surveys in areas of planned fuel projects. The cost for general surveys is also considered baseline.
226. In the future, management costs for protection of the butterfly in San Bernardino National Forest are expected to decrease, but will remain higher than expenditures in the previous ten years. Surveys are dependent on many factors, including drought conditions and unpredictable forest fires. The San Bernardino National Forest is forecast to spend approximately \$75,000 annually over the next 23 years.¹⁸² There are no forecast policy changes in response to critical habitat designation.
227. Future fire management costs could increase in Cleveland National Forest due to critical habitat designation. The newly proposed critical habitat includes an area along a highway that has experienced frequent fire starts, approximately one every five years. The Cleveland National Forest expects to spend approximately \$10,000 per such fire event in the future. This cost includes consultations for fire suppression using bulldozers or other equipment, and flame retardant, along with the costs of carrying out required activities. Costs due to flame retardant use could also increase due to a recently issued Biological Opinion from the Service; details of this decision are discussed below. In addition to emergency consultations, there is likely to be a planned fuel break in this area in the next three years. The anticipated cost is \$100,000 due to the size and nature of the project, however the greater cost is not due specifically to critical habitat considerations therefore it is considered baseline.¹⁸³
228. A consultation with the Service regarding a powerline in proposed critical habitat is also expected to occur every 10 years.¹⁸⁴ The total baseline cost associated with these three

¹⁷⁹ Personal communication, Anne Poopatanapong, Wildlife Biologist, SBNF, May 8, 2008.

¹⁸⁰ Ibid.

¹⁸¹ Ibid.

¹⁸² Ibid.

¹⁸³ Written communication, Kirsten Winter, Forest Biologist, Cleveland National Forest, July 2, 2008.

¹⁸⁴ Personal communication, Kirsten Winter, Forest Biologist, Cleveland National Forest, May 5, 2008.

consultations is estimated to be \$45,000, while the incremental cost associated with critical habitat designation is expected to be \$15,000.¹⁸⁵

Use of Flame Retardant for Wildfire Suppression

229. In February 2008, the Service issued a Biological Opinion regarding the use of flame retardants in national forests and impacts to endangered species. It was determined that 45 threatened or endangered species, including the butterfly, are in jeopardy due to use of this chemical.¹⁸⁶
230. The Service found that use of flame retardant was likely to negatively impact both the butterfly and its habitat by encouraging the invasion of non-native plant species and potentially causing direct mortality to adult and juvenile butterflies. Given these effects, the Service determined that flame retardant use could “reduce appreciably the likelihood of the species’ survival and recovery in the wild and is likely to jeopardize its continued existence.”¹⁸⁷
231. While this Biological Opinion “in no way limits the actions that are deemed necessary to undertake during a fire emergency response...at a minimum, if fire retardant is used in the vicinity of listed species or critical habitat, the USFS must conduct consultation...”.¹⁸⁸ Therefore, the minimum impacts of this opinion will be increased consultations for both Forests. As discussed previously, additional costs in San Bernardino National Forest are expected to be \$10,000 per consultation for flame retardant use.¹⁸⁹ However, specific cost figures were not provided by CNF. Resource managers in both Forests indicated that it was very difficult to predict the total costs of this opinion, although they acknowledged that additional costs are likely to be incurred as a result of requirements established by the Service.

7.2.4. CALIFORNIA DEPARTMENT OF FISH AND GAME (UNITS 2, 6 AND 8)

232. CDFG does not actively manage habitat for the butterfly. However, the Agency does conduct fire management for another endangered species, the Stephens’ kangaroo rat. Management for this species includes controlled burns, fuel breaks, and mowing to eliminate exotic grass species. While this activity could have ancillary benefits for the butterfly by protecting its habitat, this activity is entirely attributable to the Stephens’ kangaroo rat, therefore costs are not attributed to listing or habitat designation for the butterfly.¹⁹⁰

¹⁸⁵ Costs of consultations are estimated using the Section 7 Administrative consultation model presented in section 2 (see Exhibit 2-2).

¹⁸⁶ U.S. Fish and Wildlife Service. “Final Biological and Conference Opinion on the USDA Forest Service’s Proposed *Guidelines for Aerial Application of Fire Retardant and Foams in Aquatic Environments*”

¹⁸⁷ *Ibid*, pg. 70.

¹⁸⁸ *Ibid*, page 1.

¹⁸⁹ Written and personal communication, Kirsten Winter, CNF Forest Biologist, May 5, 2008.

¹⁹⁰ Personal communication, Eddy Konno, Lands Program Manger, CDFG, May 23, 2008.

233. Use of off-road vehicles (ORVs) is not allowed in CDFG lands; however there has been some evidence of illegal use in proposed Unit 2, including cut barbwire fences and vehicle tracks. Enforcement costs associated with illegal ORV use generally include fence repair and patrolling, but these practices are part of general lands management and cannot be directly attributed to conservation of the butterfly and its habitat.¹⁹¹
234. If critical habitat is designated as proposed, active habitat management for the butterfly could be instituted, although any activity in this regard would be dependent on outside funding. Due to lack of historical management experience, the future management activities and associated costs cannot be assessed at this time.¹⁹²
235. Other management activities occurring in CDFG parcels include invasive species management and a proposal to allow hunting in the French Valley wildlife area located in Unit 2. The CDFG actively removes eucalyptus and restores habitat, including the creation of vernal pools. Neither of these management activities relates to butterfly nor are they expected to affect the species and its habitat.¹⁹³

7.2.5 SAN DIEGO NATIONAL WILDLIFE REFUGE (UNIT 8)

236. The San Diego National Wildlife Refuge (NWR) is managed jointly for conservation of the butterfly by the Service and CDFG.¹⁹⁴ Management activities for the butterfly include monitoring surveys, nursery production of host plants, habitat restoration, and conservation research for the butterfly and its habitat. Surveys were conducted by the Service staff in 2001 and project-based surveys were conducted in 2003, both of which recorded the expansion of occurrence complexes.¹⁹⁵ Funding for the Refuge during this time remained at approximately \$3 million a year.¹⁹⁶
237. Management for the butterfly currently includes annual monitoring for the species and its host plants, in addition to habitat restoration. Monitoring is conducted by a refuge biologist; therefore costs for this activity are based on time spent in the field.¹⁹⁷ From 2005-2007, approximately \$1,584 was spent on monitoring.¹⁹⁸ Monitoring activities increased in 2008 and are expected to remain stable over the next 5 years at an annual

¹⁹¹ Ibid.

¹⁹² Ibid.

¹⁹³ Ibid.

¹⁹⁴ U.S. Fish and Wildlife Service, Recovery Plan for the Quino Checkerspot Butterfly (*Euphydryas editha quino*). August 11, 2003.

¹⁹⁵ Ibid. Discussion with the Refuge Manager occurred too late for inclusion in this draft but will appear in subsequent versions of this report.

¹⁹⁶ Individual costs associated with the butterfly are not included in this analysis because a breakdown is not provided in the Recovery Plan.

¹⁹⁷ Monitoring costs are estimated using information provided by Refuge biologist John Martin and the GS Level 9 hourly rate.

¹⁹⁸ Personal communication, John Martin, Biologist, San Diego National Wildlife Refuge. June 11, 2008.

cost of \$2,310. Projection of monitoring activity beyond this date is not possible at this time since management planning at the refuge does not go beyond this time period.¹⁹⁹

238. In addition to monitoring, habitat restoration is conducted at the refuge for several endangered species. Two habitat restoration projects are currently underway that may provide ancillary benefits to the Butterfly, although they are not specifically designed for this species. For the Otay Tarplant, 67 acres are being restored which may also provide habitat for the California Gnatcatcher as well as the butterfly. In addition, a 30-acre vernal pool restoration project under construction is likely to provide habitat for the San Diego Fairy Shrimp, Burrowing Owl, spreading navarettia, Otay tarplant and the butterfly. The costs of these projects are not included in this analysis as they are not intended to specifically benefit the butterfly. However, a project is currently in development to be carried out in 2008 which specifically targets this species.
239. The habitat restoration proposed for the butterfly involved invasive nonnative plant removal and long-term control in the Harris Fire area.²⁰⁰ This area is part of the approximately 4,000 acres of the refuge lost to the 2007 wildfires. The refuge applied for state funds to compensate for this loss through the Burned Area Emergency Rehabilitation (BAER) program. It is expected that the refuge will receive \$292,000 in 2008.²⁰¹ Only 24 percent of the land area to be restored falls within critical habitat; therefore, the cost included for Unit 8 is \$71,000 in 2008.²⁰²
240. Future management for the butterfly may include habitat restoration targeting other endangered species but with benefits to the butterfly. Applications have been submitted to the California Department of Transportation for \$1.1 million over 6 years to restore 100 acres to native clay-soil grassland and for \$308,000 over 5 years to continue the aforementioned vernal pool project.²⁰³ Both of these projects are broad land management actions that benefit multiple species, including the butterfly. Additionally, there is no guarantee that the funding will be received and projects carried out since they are still in the initial stages of securing funding. Other management activities in the future may include a butterfly reintroduction program, although this would likely occur outside of critical habitat.²⁰⁴ The cost and likelihood of implementation for these projects is dependent on staffing and funding at the refuge, therefore estimates cannot be provided.

¹⁹⁹ Ibid.

²⁰⁰ Ibid.

²⁰¹ Note that this project is still under review by BAER personnel and subject to change. However, the certainty of completion in 2008 is greater than 50 percent and therefore included in the costs incurred by the refuge for protection of the butterfly (Written communication, John Martin, Biologist, SDNWR, July 2, 2008).

²⁰² Based on GIS sent by John Martin, Refuge Manager.

²⁰³ Personal communication, John Martin, Biologist, SDNWR, June 11, 2008.

²⁰⁴ Ibid.

7.2.6 CENTER FOR NATURAL LANDS MANAGEMENT (UNITS 1, 2, 4)

241. CNLM is a private organization focused on planning and management of mitigation and conservation lands in California.²⁰⁵ It manages several preserves and works toward conservation of multiple species found in these preserves. CNLM manages conservation programs for the butterfly in Riverside County in proposed Units 1, 2, and 4. Based on GIS analysis of lands owned by the CNLM, and information provided by the Service in the Proposed Rule, it was determined that all CNLM owned are within areas considered for exclusion. According to the CNLM, all lands currently managed for the butterfly also lie within existing critical habitat designated in 2002, so management for this species has already been integrated into activities carried out by the organization.²⁰⁶
242. CNLM is funded primarily through mitigation banks that are supported by conservation related fees collected from development projects. Part of these resources are spent on butterfly related conservation measures such as species monitoring, weed control and herbicide application, and patrolling and maintenance of fences to prevent unauthorized entry of people into the preserves. In the future, the agency also expects to be involved in a routine consultation (technical assistance) with the Service regarding weed management in approximately 3 of every 5 years. The annual expenditure incurred by CNLM for these conservation efforts is summarized in Exhibit 7-3. Because these conservation efforts are already in place, these impacts are considered as baseline economic impacts in this analysis.

EXHIBIT 7-3 ESTIMATES OF ANNUAL EXPENDITURES BY CNLM- AREAS CONSIDERED FOR EXCLUSION (2001-2030)

UNIT	UNIT NAME	ACTIVITY TYPE	AVERAGE ANNUAL COST
1	Warm Springs	Monitoring	\$2,000
		Weed management	\$2,000
		Patrolling	\$2,000
2	Skinner/Johnson	Monitoring	\$1,100
		Weed management	\$3,000
		Patrolling	\$5,000
4	Wilson Valley	Monitoring	\$4,000
		Patrolling	\$1,500
In addition to the above costs, CNLM expects to spend about \$1,130 annually in 60 % of future years on consultations regarding conservation efforts in Units 1, 2 and 4, or approximately \$20,700 over 23 years (\$900 annually).			

²⁰⁵ Center for Natural Lands Management. About CNLM. Last accessed at <http://www.cnlm.org> on May 30, 2008.

²⁰⁶ Personal communication. Eliza Maher, Preserve Manager, Center for Natural Lands Management, May 27, 2008.

7.2.7 RIVERSIDE COUNTY (UNIT 2)

243. Riverside County is involved in butterfly related conservation efforts within a 14,000 acre Multi-Species Reserve that overlaps with proposed Unit 2 (Skinner/Johnson). The County is responsible for habitat enhancement that consists of weed abatement and herbicide application, and expects to conduct annual surveys starting this year (2008). The habitat enhancement program began in 2004 and costs \$1,100 annually. The County expects to spend approximately 60 staff hours annually on surveys; the expected hourly cost of the surveys is \$35. All these costs are expected to occur in all future years. Because these efforts have been planned regardless of the proposed critical habitat designation, these impacts are attributed to the baseline.

7.2.8 CALIFORNIA STATE LANDS COMMISSION (UNIT 7)

244. CSLC manages two types of land in California: sovereign lands, which are navigable waterways, and school lands, or properties given to the State by the Federal government for use in the educational system.²⁰⁷ CSLC lands are open to the public and generally allow for such activities as recreation, grazing, agriculture, and pipeline development. The Commission does not actively manage habitat for wildlife or conduct maintenance of the land in any way; it also does not conduct enforcement of any environmental or other laws.²⁰⁸ According to a review of CSLC files, the Commission has no jurisdiction over lands in proposed critical habitat.²⁰⁹

7.2.9 U.S. CUSTOMS AND BORDER PROTECTION (UNITS 8, 9 AND 10)

245. The Department of Homeland Security (DHS) and CBP are currently constructing a fence and associated infrastructure along the U.S.-Mexico border. DHS Secretary Chertoff has waived all of the environmental regulatory requirements associated with this project.²¹⁰ As a direct result of this waiver, no conservation measures developed in consultation with the Service have been enacted and no conservation expenditures have been made.²¹¹ A total of \$50 million may be made available for conservation across all environmental concerns, but this potential sum has not, to date, been authorized.²¹² The only measurable cost incurred thus far is the administrative cost of consultation.²¹³ Consultations with

²⁰⁷ Personal communication, Barbara Dugal, Division Chief of Land Management, California State Lands Commission, May 14, 2008.

²⁰⁸ Ibid.

²⁰⁹ Written communication, Jim Porter, Public Land Management Specialist, CSLC, June 3, 2008.

²¹⁰ Marosi, Richard and Nicole Gauette, "Environmental Rules Waived for Mexican Border Fence," Los Angeles Times, April 2, 2008.

²¹¹ Prior to establishment of the waiver, the DHS and Army Corps of Engineers developed Best Management Practices relating to the butterfly and other species' protection. These Agencies have expressed interest in implementation of these BMPs, although the nature and likelihood of this occurrence is uncertain. (Written communication, Joyce Schlacter, BLM Biologist for San Diego County, June 2, 2008.)

²¹² Personal communication with Joyce Schlacter, BLM Biologist for San Diego County, May 27, 2008.

²¹³ Personal communication, Senior Biologist, Carlsbad Fish and Wildlife Office, May 21, 2008.

DHS are based out of the Service's Carlsbad Fish and Wildlife Office. Current administrative expenditures by this office for the butterfly relating to DHS projects are estimated to be \$2,464 per year.²¹⁴ This level of effort is consistent with historical administration of the species and is expected to continue over the next 23 years.

7.3 GRAZING

246. Grazing can pose a threat to the butterfly and its habitat through direct mortality, or through disturbance of topsoils, which hastens the dispersal of invasive species that do not support the butterfly. Grazing may occur within the study area on lands managed by USFS and BLM. Potential impacts associated with this activity are discussed below.

7.3.1 USFS (UNITS 5 AND 7)

247. There is no grazing in Cleveland National Forest, within proposed critical habitat Unit 5.²¹⁵ However, USFS allows grazing in proposed critical habitat Unit 7, within the boundary of San Bernardino National Forest. In San Bernardino National Forest, USFS is in the process of implementing its 2005 Land Management Plan, which includes provisions to continue grazing on three allotments in the San Jacinto Ranger District. Of the three active grazing allotments, only the Rouse allotment overlaps with the proposed critical habitat.²¹⁶ Approximately 3,600 acres of proposed critical habitat are contained within this allotment.²¹⁷

248. The grazing plan currently takes into consideration the conservation of the butterfly; therefore any impacts to grazing are considered baseline and designation of critical habitat is not expected to alter management of this activity.²¹⁸ Management for the butterfly may include restricted grazing from February to June in areas of known populations, to avoid the breeding season.²¹⁹ The current plan allows for 150 head

²¹⁴ One Carlsbad Fish and Wildlife Biologist spends approximately two weeks annually on this species for DHS projects. The administrative costs are based on his time. Note that consultations relating to the butterfly often include other threatened and endangered species, so these estimates may overstate costs for this species individually. Cost estimated using mean hourly rate for GS Level 9 for 2008, which is \$22 per hour.

²¹⁵ Personal communication, Kirsten Winter, CNF Forest Biologist, May 5, 2008.

²¹⁶ USDA Forest Service, "Proposed Action and Purpose and Need San Jacinto Ranger District Range Allotments", San Bernardino National Forest, no date provided. Accessed at: http://www.fs.fed.us/r5/sanbernardino/documents/sjrd_allotments_proposed_action.pdf. Note that critical habitat falls within the Rouse allotment and the Jim Burn pasture, which is currently part of the Paradise pasture, but will be integrated into this allotment in the future. The Paradise allotment also contains about 384 acres of critical habitat, but no information is provided in the plan regarding management of this area.

²¹⁷ This value is based on GIS analysis provided through personal communication with Dawn Peterka, GIS Biologist, SBNF, June 2, 2008. Note that these values do not include areas considered for exclusion, since SBNF has no jurisdiction over private lands and therefore has no control over grazing in these areas

²¹⁸ Note that this plan is currently under review by the Service, but it is likely to be implemented as currently proposed. (Personal communication, Anne Poopatanapong, Wildlife Biologist, SBNF, June 2, 2008.)

²¹⁹ USDA Forest Service, "Proposed Action and Purpose and Need San Jacinto Ranger District Range Allotments", San Bernardino National Forest, no date provided. Accessed at: http://www.fs.fed.us/r5/sanbernardino/documents/sjrd_allotments_proposed_action.pdf.

months on the Rouse allotment for 12 months and restricted grazing on the Jim Burn pasture (part of the Rouse allotment) during butterfly breeding season.²²⁰ Therefore, costs associated with butterfly management are based on lost seasonal use of the Jim Burn pasture, which is estimated at \$75 annually.²²¹

7.3.2 BUREAU OF LAND MANAGEMENT

249. There is no active grazing on BLM lands within proposed critical habitat. There are open leases in Units 6, 8, and 9, but the owners of these allotments are currently accepting “nonuse” payments and have no foreseeable plans to reinstate grazing in the near future.²²² These nonuse payments are not related to butterfly conservation or critical habitat designation.

7.4 MINING

250. Although mining is listed as a potential threat to proposed critical habitat, this activity is not currently taking place in any of the proposed units. This section considers the potential for new mines on USFS and BLM lands.

7.4.1 US FOREST SERVICE

251. There is no mining activity within USFS lands that are proposed for critical habitat designation.²²³ The potential for future mining in proposed critical habitat cannot be determined at this time.²²⁴

7.4.2 BUREAU OF LAND MANAGEMENT

252. There are no active mining claims on BLM lands in any critical habitat units. However, the entire area is still open to mining and any proposed activity would require full consultation with the Service and thorough review of impacts to butterfly and its habitat. If mining were proposed within the bounds of critical habitat, there is potential for

²²⁰ Ibid.

²²¹ According to the Proposed Action, the Jim Burn pasture holds approximately 10 calves and cows. This value is multiplied by the percentage of lost months (5/12 or about 42%) and the estimated market value of AUMs, (\$18/year) to determine the lost value of pasture not grazed during butterfly breeding season. (USDA Forest Service, “Proposed Action and Purpose and Need San Jacinto Ranger District Range Allotments”, San Bernardino National Forest, no date provided. Accessed at: http://www.fs.fed.us/r5/sanbernardino/documents/sjrd_allotments_proposed_action.pdf).

²²² Potential future grazing costs are currently being further assessed in conjunction with BLM staff using GIS data and standard methods. Any additional costs will be integrated into future drafts of this report.

²²³ Personal communication, Kirsten Winter, CNF Forest Biologist, May 5, 2008; Personal communication, Anne Poopatanapong, SBNF Wildlife Biologist, May 8, 2008.

²²⁴ USFS has been contacted to determine expectations for future mining activity in the proposed habitat. As new information becomes available, this analysis will be updated.

restriction of these activities, depending on the determination made through the consultation process.²²⁵

7.5 CLIMATE CHANGE AND ATMOSPHERIC POLLUTION

253. Several threats related to climatic or atmospheric conditions are identified in the proposed rule, including climate change, increased atmospheric carbon dioxide, and nitrogen deposition.²²⁶ These threats are broad and regional in nature and therefore have the potential to affect the entire study area.

7.5.1 CLIMATE CHANGE

254. Substantial scientific evidence suggests that the world's climate is being affected by anthropogenic emissions of carbon dioxide and other green house gases, causing a warming of global temperatures and myriad ecological impacts.²²⁷ One such impact is a shift in the local climate and range-wide distribution of the butterfly. The most recent sub-species evidence indicates an on-going range shift at the northern edge of the butterfly's range to northern areas with greater precipitation.²²⁸ In addition, recent surveys indicate colonization of higher elevation habitat from areas of lower elevation over the past 10-15 years, resulting in population growth in previously unoccupied northern regions.²²⁹ One explanation for this shift is increased mortality of prediapuse larvae due to early host plant aging in the southern portion of the butterfly's range.²³⁰ These observations suggest that regional warming and drying associated with global climate change pose a substantial threat to the species' survival.²³¹
255. The impacts of climate change necessitate "prudent design of reserves and other managed habitats."²³² Specifically, future management should preserve the highest quality and density occupied habitats at leading edges of range shift (i.e. higher elevations, and northern edge).²³³ Preserves should also provide habitat and landscape connectivity

²²⁵ Personal communication, Holly Roberts, Associate Field Manger, Palm Springs - South Coast Field Office, May 28, 2008.

While it is unlikely that mining will occur within the proposed critical habitat in the next 23 years, additional information is anticipated from the Minerals Manager at BLM Palm Springs South Coast.

²²⁶ 73 FR 3336.

²²⁷ Intergovernmental Panel on Climate Change, 2007. "Climate Change 2007: Synthesis Report Summary for Policymakers." Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

²²⁸ 73 FR 3332.

²²⁹ Ibid.

²³⁰ Parmesan, 1996 as cited in the U.S. Fish and Wildlife Service, Recovery Plan for the Quino Checkerspot Butterfly (*Euphydras editha quino*). August 11, 2003.

²³¹ U.S. Fish and Wildlife Service, Recovery Plan for the Quino Checkerspot Butterfly (*Euphydras editha quino*). August 11, 2003, pg. 63.

²³² Ibid.

²³³ Written communication, Biologist, Carlsbad Fish and Wildlife Field Office, May 15, 2008.

between occupied habitats at the leading edge of the range shift with unoccupied potential habitat where new colonization is expected to occur.²³⁴

256. A new critical habitat unit has been specifically proposed to address this issue. Unit 7 has been added because it contains higher elevation habitat in an area where the butterflies are expected to migrate.²³⁵ Conservation costs associated with this unit are included with the activities affected and are summarized in the Executive Summary.

7.5.2 INCREASED ATMOSPHERIC CARBON DIOXIDE

257. A closely related but distinct impact of climate change is the effect of increased carbon dioxide on growth of host plant species and the physiology of the butterfly. As carbon dioxide concentrations in the atmosphere increase, photosynthesis and plant growth rates increase. An indirect result of increased growth rates in the chaparral and scrub communities is increased canopy cover and reduction of habitat favored by the butterfly.²³⁶ Other chemical changes in plants resulting from increased carbon dioxide include reduced food quality for leaf-eating insects such as the butterfly.²³⁷
258. A parallel and potentially more destructive impact of carbon dioxide increase is impaired development and increased mortality of butterflies. In experiments of a closely related butterfly species, larval mortality increased by 36 percent when the carbon dioxide concentration doubled.²³⁸ Other potential impacts include extended prediapause development, which could increase the risk of mortality from early host plant decline and predation.
259. Future costs associated with mitigating this threat include research and development costs for determining the species-specific impacts and appropriate management techniques.²³⁹ At this time there are no data available concerning costs or impacts related to addressing this threat.

7.5.3 NITROGEN DEPOSITION AND ENHANCED SOIL NITROGEN

260. Nitrogen deposition occurs when excess nitrogen from activities such as burning of fossil fuels and production of fertilizer is released into the atmosphere. This nitrogen is then available for fixation in the soil, where increased nitrogen levels can exacerbate the invasion of non-native plant species. Specifically, increased nitrogen can lead to an increase in exotic grass biomasses that may increase fire frequency and compete directly

²³⁴ Ibid.

²³⁵ Personal communication, Biologist, Carlsbad Fish and Wildlife Field Office, May 13, 2008.

²³⁶ U.S. Fish and Wildlife Service, Recovery Plan for the Quino Checkerspot Butterfly (*Euphydras editha quino*). August 11, 2003, pg. 63.

²³⁷ Ibid.

²³⁸ Fajer 1989; Fajer *et al.* 1989, 1991, as cited in the U.S. Fish and Wildlife Service, Recovery Plan for the Quino Checkerspot Butterfly (*Euphydras editha quino*). August 11, 2003.. pg. 63.

²³⁹ U.S. Fish and Wildlife Service, Recovery Plan for the Quino Checkerspot Butterfly (*Euphydras editha quino*). August 11, 2003.

with a host plant (*Plantago*) of the butterfly.²⁴⁰ Research in this area is ongoing, although preliminary results suggest that the habitat of the butterfly and thus the butterfly itself, are at risk.

261. Weed control and invasive species management is the primary method for addressing the effects of nitrogen deposition and soil enhancement. More detailed information, including the cost of such programs is currently unavailable.²⁴¹

7.6 PRE-DESIGNATION BASELINE IMPACTS

262. Exhibit 7-4 presents total pre-designation impacts of habitat management and other activities discussed in this Chapter.

EXHIBIT 7-4 TOTAL PRE-DESIGNATION IMPACTS OF HABITAT MANAGEMENT AND OTHER ACTIVITIES (1997 - 2007, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE
2	Skinner/Johnson		\$0
3	Sage		\$0
4	Wilson Valley		\$0
5	Vail Lake/Oak Mountain		\$832,000
6	Tule Peak		\$16,300
7	Bautista		\$232,000
8	Otay	06073010014	\$133
		06073010015	\$32,900
		06073013313	\$10
		06073021100	\$1,860
		06073021302	\$358,000
		06073021303	\$124
		06073021304	\$11,600
9	La Costa / Campo		\$95,500
10	Jacumba		\$2,640
Subtotal			\$1,580,000
CONSIDERED FOR EXCLUSION			
1	Warm Springs		\$78,700
2	Skinner/Johnson		\$147,000
3	Sage		\$22,100
4	Wilson Valley		\$88,400
5	Vail Lake/Oak Mountain		\$55,600
6	Tule Peak		\$42,200
7	Bautista		\$37,700

²⁴⁰ Written communication, Edith Allen, Professor of Plant Ecology, University of California Riverside, May 20, 2008.

²⁴¹ While weed control programs are currently in place at such locations as the San Diego National Wildlife Refuge (Unit 8) and a plan is proposed for use by the Navy (Unit 9), these programs do not relate to nitrogen deposition. More information would be needed to determine whether a program to address this threat would be similar to invasive species programs already in place.

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE
8	Otay	06073010014	\$162,000
		06073013313	\$494,000
		06073021302	\$20,800
Subtotal			\$1,150,000
TOTAL			\$2,730,000
Note:			
1. Totals may not sum due to rounding.			
2. Totals include the cost of relevant HCPs presented in Chapter 3, section 3.2.2.			

7.7 POST-DESIGNATION BASELINE IMPACTS

263. Exhibit 7-5 presents total post-designation baseline impacts of habitat management and other activities discussed in this Chapter.

EXHIBIT 7-5 TOTAL POST-DESIGNATION BASELINE IMPACTS OF HABITAT MANAGEMENT AND OTHER ACTIVITIES (2008 - 2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE	ANNUALIZED
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$142,000	\$11,800
6	Tule Peak		\$29,900	\$2,480
7	Bautista		\$1,070,000	\$88,600
8	Otay	06073010014	\$3,370	\$279
		06073010015	\$48,500	\$4,020
		06073013313	\$251	\$21
		06073021100	\$6,830	\$566
		06073021302	\$512,000	\$42,500
		06073021303	\$3,140	\$261
		06073021304	\$43,400	\$3,600
9	La Costa / Campo		\$124,000	\$10,300
10	Jacumba		\$29,700	\$2,460
Subtotal			\$2,010,000	\$167,000
CONSIDERED FOR EXCLUSION				
1	Warm Springs		\$125,000	\$10,300
2	Skinner/Johnson		\$278,000	\$23,000
3	Sage		\$48,000	\$3,980
4	Wilson Valley		\$151,000	\$12,500
5	Vail Lake/Oak Mountain		\$121,000	\$10,000
6	Tule Peak		\$91,600	\$7,590

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE	ANNUALIZED
7	Bautista		\$81,700	\$6,770
8	Otay	06073010014	\$317,000	\$26,300
		06073013313	\$968,000	\$80,300
		06073021302	\$40,700	\$3,370
Subtotal			\$2,220,000	\$184,000
TOTAL			\$4,230,000	\$351,000
Note:				
1. Totals may not sum due to rounding				
2. Totals include the cost of relevant HCPs presented in Chapter 3, section 3.2.2.				

7.8 POST-DESIGNATION INCREMENTAL IMPACTS

264. Exhibit 7-6 presents total future incremental impacts of habitat management and other activities discussed in this Chapter.

EXHIBIT 7-6 TOTAL POST-DESIGNATION INCREMENTAL IMPACTS OF HABITAT MANAGEMENT AND OTHER ACTIVITIES (2008 - 2030, 2008 DOLLARS)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE (SEVEN PERCENT DISCOUNT RATE)	ANNUALIZED (SEVEN PERCENT DISCOUNT RATE)
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$8,830	\$732
6	Tule Peak		\$458	\$38
7	Bautista		\$0	\$0
8	Otay	06073010014	\$0	\$0
		06073010015	\$873	\$72
		06073013313	\$0	\$0
		06073021100	\$45	\$4
		06073021302	\$9,510	\$789
		06073021303	\$0	\$0
		06073021304	\$278	\$23
9	La Costa / Campo		\$2,550	\$212
10	Jacumba		\$0	\$0
Subtotal			\$22,600	\$1,870
CONSIDERED FOR EXCLUSION				
1	Warm Springs		\$0	\$0
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE (SEVEN PERCENT DISCOUNT RATE)	ANNUALIZED (SEVEN PERCENT DISCOUNT RATE)
6	Tule Peak		\$0	\$0
7	Bautista		\$0	\$0
8	Otay	06073010014	\$0	\$0
		06073013313	\$0	\$0
		06073021302	\$0	\$0
Subtotal			\$0	\$0
TOTAL			\$22,600	\$1,870
Note:				
1. Totals may not sum due to rounding				
2. Totals include the cost of relevant HCPs presented in Chapter 3, section 3.2.2.				

7.9 KEY SOURCES OF UNCERTAINTY

265. The sources of uncertainty in the estimates provided in this Chapter primarily concern currently available data. In several cases, data have been requested from stakeholders but has not been forthcoming. Total impact estimates may increase as information becomes available.

- This analysis estimates probable impacts based on currently available funding for management activities on Federal lands. To the extent that budget allocations change, this Chapter may over- or under-state management costs.
- The threats of climate change, nitrogen deposition, and increased atmospheric carbon dioxide may impose substantial impacts. However, given existing uncertainty regarding management goals and their implementation, these impacts are difficult to assess. As a result, this analysis may understate the full costs of butterfly conservation.

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APPENDIX A | SMALL BUSINESS ANALYSIS AND ENERGY IMPACTS ANALYSIS

266. This appendix considers the extent to which incremental impacts from critical habitat designation may be borne by small entities and the energy industry. The analysis presented in Section A.1 is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. Information for this analysis was gathered from the Small Business Administration (SBA), the Service, and from interviews with stakeholders contacted in the development of the economic analysis. The energy analysis in Section A.2 is conducted pursuant to Executive Order No. 13211.
267. The analyses of impacts to small entities and the energy industry rely on the estimated incremental impacts resulting from the proposed critical habitat designation. The incremental impacts of the rulemaking are most relevant for the small business and energy impacts analyses, because they reflect costs that may be avoided or reduced based on decisions regarding the composition of the final rule. The post-designation baseline impacts associated with the listing of the butterfly and other State and local regulations and policies, as quantified in Chapters 4 through 7 of this report, are expected to occur regardless of the outcome of this rulemaking.
- A.1 SBREFA ANALYSIS**
268. When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).²⁴² No initial regulatory flexibility analysis (IRFA) 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 RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities. To assist in this process, this appendix provides a screening level analysis of the potential for butterfly critical habitat to affect small entities.
269. To ensure broad consideration of impacts on small entities, the U.S. Fish and Wildlife Service has prepared this small business analysis without first making the threshold determination whether the proposed critical habitat designation could be certified as not having a significant economic impact on a substantial number of small entities.

²⁴² 5 U.S.C. § 601 et seq.

A.1.1 SUMMARY OF IMPACTS TO SMALL ENTITIES

270. This screening analysis is based on the estimated incremental impacts associated with the proposed rulemaking as described in Chapters 4 through 7 of this analysis. The analysis evaluates the potential for economic impacts related to the following activity categories:

- Residential development;
- Non-residential development (including transportation, utilities construction and management, commercial and industrial development, and agriculture);
- Development and habitat management activities undertaken by Tribes; and
- Other Habitat Management activities.

This analysis concludes that the only incremental impacts for small businesses are associated with residential development, with the only potentially significant costs occurring in Units 9 and 10. Because there is some uncertainty regarding the number of future residential development projects, the impacts to small businesses are presented as a range.²⁴³

A.1.2 DETAILED ANALYSIS OF IMPACTS TO SMALL BUSINESSES

271. This analysis is intended to improve the Service's understanding of the potential effects of the proposed rule on small entities and to identify opportunities to minimize these impacts in the final rulemaking. The Endangered Species Act (Act) requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable. Section 4(b)(2) of the Act requires that the Service designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impact, of specifying any particular areas as critical habitat." The Secretary's discretion is limited as (s)he may not exclude areas if so doing "will result in the extinction of the species."

272. Three types of small entities are defined in the RFA:

- **Small Business** - Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently owned and operated and is not dominant in its field of operation. The U.S. Small Business Administration (SBA) has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR 121.201. The size standards are matched to North American Industry Classification System (NAICS) industries. The SBA definition of a small business applies to a firm's parent company and all affiliates as a single entity.
- **Small Governmental Jurisdiction** - Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special

²⁴³ See Chapter 4 for more details.

districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.

- **Small Organization** - Section 601(4) defines a small organization as any not-for-profit enterprise that is independently owned and operated and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc.

273. The courts have held that the RFA/SBREFA requires Federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy Regulatory Commission (FERC)*, FERC proposed regulations affecting the manner in which generating utilities incorporated construction work in progress in their rates. The generating utilities that expected to be regulated were large businesses; however, their customers -- transmitting utilities such as electric cooperatives -- included numerous small entities. In this case, the court agreed that FERC simply authorized large electric generators to pass these costs through to their transmitting and retail utility customers, and FERC could therefore certify that small entities were not directly impacted within the definition of the RFA.²⁴⁴
274. Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency (EPA)* addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and particulate matter.²⁴⁵ The basis of EPA's RFA/SBREFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of state plans that incorporated the standards. The court found that, while EPA imposed regulation on states, it did not have authority under this rule to impose regulations directly on small entities and therefore small entities were not directly impacted within the definition of the RFA.
275. The Small Business Administration (SBA) in its guidance on how to comply with the RFA recognizes that consideration of indirectly affected small entities is not required by the RFA, but encourages agencies to perform a regulatory flexibility analysis even when the impacts of its regulation are indirect.²⁴⁶ "If an agency can accomplish its statutory mission in a more cost-effective manner, the Office of Advocacy [of the SBA] believes that it is good public policy to do so. The only way an agency can determine this is if it does not certify regulations that it knows will have a significant impact on small entities

²⁴⁴ 773 F. 2d 327 (D.C. Cir. 1985).

²⁴⁵ 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

²⁴⁶ Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act. pg. 20.

even if the small entities are regulated by a delegation of authority from the Federal agency to some other governing body."²⁴⁷

276. The regulatory mechanism through which critical habitat protections are enforced is section 7 of the Act, which directly regulates only those activities carried out, funded, or permitted by a Federal agency. By definition, Federal agencies are not considered small entities, although the activities they may fund or permit may be proposed or carried out by small entities. Given the SBA guidance described above, this analysis considers the extent to which this designation could potentially affect small entities, regardless of whether these entities would be directly regulated by the Service through the proposed rule or by a delegation of impact from the directly regulated entity.
277. This screening analysis focuses on small entities that may bear the incremental impacts of this rulemaking quantified in Chapters 4 through 7 of this economic analysis. Although businesses affected indirectly are considered, this analysis considers only those entities for which impact would not be measurably diluted. This analysis concludes that the only incremental impacts associated with this rulemaking are administrative costs associated with section 7 consultations to address adverse modification and potential project modifications and time delays anticipated for a small number of development projects in areas where the butterfly is not detected during surveys. All or a portion of these incremental costs may be borne by small entities (third parties to the consultation) associated with residential development in the region.

Residential Development

278. The largest impacts of the proposed rule result from section 7 consultations with the Service on development projects likely to occur in areas where surveys are unable to detect the butterfly. In the high estimate scenario, five projects in Unit 9 and nine projects in Unit 10 are likely to require consultation with the Service as a result of the proposed rule. Conservatively assuming that each project is undertaken by a separate entity, as many as 14 developers are likely to be affected over the 23-year time frame of the analysis. At the high-end, the one-time costs resulting from the consultation process, including administrative time spent by the businesses, compensation costs, and the value of time delays, total approximately \$16.1 million for the projects in Unit 9 and \$26.8 million for the projects in Unit 10.
279. In addition, over the 23-year time frame, a high-end estimate of 131 projects (approximately six projects per year) will experience additional administrative costs as a result of the consultation. These costs result from the need to address adverse modification in a consultation that would occur even in the absence of critical habitat. These additional administrative costs are estimated to be \$1,000 per project.
280. The median revenues from the sale of a single new home in the census tracts within the study area range from \$369,000 to \$775,000. As a result, depending on the density of development, costs incurred by the two developers in Units 9 and 10 could represent a

²⁴⁷ *Ibid.*, pg. 21.

significant portion of revenues. For the six developers per year bearing only additional administrative costs, the impacts relative to revenues is less than one percent.

281. In summary, 14 developers in the 23-year time frame for the analysis may experience significant impacts. Furthermore, approximately six developers per year will experience impacts that likely represent less than one percent of the value of a new home. No information regarding the probability that these businesses are small entities is available.
282. Note that this analysis may overstate impacts to small developers, depending on who bears the costs of section 7 consultations resulting from the designation. Understanding the regulatory implications for land in critical habitat, the developer may compensate by purchasing the raw land from the current landowner at a lower price. The reduction in land value is not likely to exceed the consultation costs. However, in this situation, the local landowner, rather than the developer, will experience the impact.
283. Other entities experiencing costs associated with residential development projects include the Service, various Federal Action agencies, and BLM (fire break construction). None of these agencies meet the definition of small entities.

Non-Residential Development

284. As discussed in Chapter 5, incremental costs of section 7 consultations related to the Clinton Keith Road construction project are expected for the Riverside County Transportation Department. Section 7 consultation related incremental impacts are also expected for San Diego Gas & Electric (SDG&E) for the Sunrise Powerlink project. As of 2006, the population of Riverside County was over 2 million, therefore it does not meet the definition of a small entity. SDG&E is a publicly-regulated utility company, employing over 3,000 people. Firms defined as providing natural gas distribution (NAICS 2212) are considered to be small entities if they have fewer than 500 employees, therefore SDG&E is not a small entity.²⁴⁸

Tribes

285. As discussed in Chapter 6, incremental costs related to future development activities are expected for the Campo Band of Kumeyaay Indians. However, the Tribe is an independent nation and therefore is not considered a small entity.

Habitat Management and Other Activities

286. The only incremental impacts related to habitat management and other activities are expected to be incurred by Cleveland National Forest. The forest manager is USFS, a Federal Agency. Therefore, no small entities are affected.

²⁴⁸ San Diego Gas & Electric Company. "About Us" webpage, last accessed on June 17, 2008 at <http://www.sdge.com/aboutus>.

A.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

287. Pursuant to Executive Order No. 13211, “Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,” issued May 18, 2001, Federal agencies must prepare and submit a “Statement of Energy Effects” for all “significant energy actions.” The purpose of this requirement is to ensure that all Federal agencies “appropriately weigh and consider the effects of the Federal Government’s regulations on the supply, distribution, and use of energy.”²⁴⁹
288. The Office of Management and Budget provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute “a significant adverse effect” when compared with the regulatory action under consideration:
- Reductions in crude oil supply in excess of 10,000 barrels per day;
 - Reductions in fuel production in excess of 4,000 barrels per day;
 - Reductions in coal production in excess of 5 million tons per year;
 - Reductions in natural gas production in excess of 25 million Mcf per year;
 - Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
 - Increases in energy use required by the regulatory action that exceed the thresholds above;
 - Increases in the cost of energy production in excess of one percent;
 - Increases in the cost of energy distribution in excess of one percent; or
 - Other similarly adverse outcomes.²⁵⁰
289. Calpine Corporation owns land in proposed critical habitat Unit 8, where it is currently undergoing construction of the Otay Mesa Energy Center. Calpine does not plan to expand its facilities nor construct new facilities in this area and has previously consulted on the projects’ effect on the butterfly critical habitat.²⁵¹
290. SDG&E operates in the critical habitat units in San Diego County. It has a low effect HCP for its ongoing maintenance and operations activities in the proposed critical habitat area.²⁵² SDG&E has proposed two alternative plans for a project known as Sunrise Powerlink Project. Under the preferred alternative, Sunrise Powerlink would not be located in the proposed critical habitat area. The alternative to the preferred plan will however route the power line through the proposed critical habitat. However, the

²⁴⁹ Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.

²⁵⁰ Ibid.

²⁵¹ Personal communication with Calpine’s Otay Energy Center Compliance Manager, on May 9, 2008.

²⁵² San Diego Gas and Electric Company QCB Low-Effect Habitat Conservation Plan, Prepared for SDG&E by Ebbin, Moser and Skaggs LLP, on May, 2007.

specified butterfly conservation measures for the alternative include off-site habitat acquisition and restoration, with incremental costs totaling \$26,190 in 2010.²⁵³ Therefore, no measurable impacts to the quantity or cost of energy production and distribution are foreseen.

²⁵³ Draft Environmental Impact Report / Environmental Impact Statement and Proposed Land Use Amendment San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, prepared by Aspen Environmental Group for CPUC and BLM, on January, 2008.

**APPENDIX B | DETAILED TABLES PROVIDING ALTERNATIVE IMPACT
ESTIMATES APPLYING A THREE PERCENT DISCOUNT RATE**

Appendix B provides detailed tables for impacts discussed in the Chapters. Present values and annualized costs are estimated based on a discount rate of three percent.

Calculating Present Value and Annualized Impacts

For each land use activity, this analysis presents economic impacts incurred in different time periods in present value terms. The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in today's dollars. Translation of the economic impacts of past or future impacts to present value terms requires the following: a) past or projected future impacts of species conservation efforts; and b) the specific years in which these impacts have been or are expected to be incurred. With these data, the present value of the past or future stream of impacts (PV_c) of bighorn sheep conservation efforts from year t to T is measured in 2008 dollars according to the following standard formula:^a

$$PV_c = \sum_{t=t_0}^{t=T} \frac{C_t}{(1+r)^{t-2008}}$$

C_t = cost of species conservation efforts in year t

r = discount rate^b

Impacts of conservation efforts for each land use activity in each unit are also expressed as annualized values (i.e., the series of equal annual costs over some defined time period that have the same present value as estimated total impacts). Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods (T). This analysis employs a forecast period of 23 years, 2008 through 2030. Annualized impacts of future conservation efforts (APV_c) are calculated using the following standard formula:

$$APV_c = PV_c \left[\frac{r}{1 - (1+r)^{-N}} \right]$$

N = number of years in the forecast period

^a To derive the present value of pre-designation conservation efforts for this analysis, t is 1997 and T is 2007; to derive the present value of post-designation conservation efforts, t is 2008 and T is 2030.

^b To discount and annualize costs, guidance provided by the OMB specifies the use of a real rate of seven percent. In addition, OMB recommends sensitivity analysis using other discount rates such as three percent, which some economists believe better reflects the social rate of time preference. (U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 *Federal Register* 5492, February 3, 2003.)

EXHIBIT B-1 TOTAL PRE-DESIGNATION IMPACTS TO RESIDENTIAL DEVELOPMENT (1997 - 2007, 2008 DOLLARS, THREE PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE
2	Skinner/Johnson		\$0
3	Sage		\$0
4	Wilson Valley		\$0
5	Vail Lake/Oak Mountain		\$0
6	Tule Peak		\$0
7	Bautista		\$0
8	Otay	06073010014	\$5,130,000
		06073010015	\$11,100,000
		06073013313	\$382,000
		06073021100	\$7,190,000
		06073021302	\$96,800,000
		06073021303	\$4,790,000
		06073021304	\$46,100,000
9	La Costa / Campo		\$0
10	Jacumba		\$2,340,000
Subtotal			\$174,000,000
CONSIDERED FOR EXCLUSION			
1	Warm Springs		\$11,700,000
2	Skinner/Johnson		\$30,400,000
3	Sage		\$0
4	Wilson Valley		\$0
5	Vail Lake/Oak Mountain		\$0
6	Tule Peak		\$0
7	Bautista		\$0
8	Otay	06073010014	\$1,960,000
		06073013313	\$6,000,000
		06073021302	\$252,000
Subtotal			\$50,200,000
TOTAL			\$224,000,000
Note: Totals may not sum due to rounding.			

**EXHIBIT B-2 TOTAL POST-DESIGNATION BASELINE IMPACTS TO RESIDENTIAL DEVELOPMENT
(2008 - 2030, 2008 DOLLARS, THREE PERCENT DISCOUNT RATE)**

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE (LOW ESTIMATE)	TOTAL PRESENT VALUE (HIGH ESTIMATE)	ANNUALIZED (LOW ESTIMATE)	ANNUALIZED (HIGH ESTIMATE)
2	Skinner/Johnson		\$23,600	\$23,600	\$1,400	\$1,400
3	Sage		\$27,800	\$27,800	\$1,640	\$1,640
4	Wilson Valley		\$103,000	\$103,000	\$6,110	\$6,110
5	Vail Lake/Oak Mountain		\$182,000	\$182,000	\$10,700	\$10,700
6	Tule Peak		\$72,500	\$72,500	\$4,280	\$4,280
7	Bautista		\$270,000	\$270,000	\$16,000	\$16,000
8	Otay	06073010014	\$76,000,000	\$76,000,000	\$4,490,000	\$4,490,000
		06073010015	\$9,750,000	\$9,750,000	\$575,000	\$575,000
		06073013313	\$57,400	\$57,400	\$3,390	\$3,390
		06073021100	\$7,090,000	\$7,090,000	\$419,000	\$419,000
		06073021302	\$627,000,000	\$627,000,000	\$37,000,000	\$37,000,000
		06073021303	\$9,630,000	\$9,630,000	\$569,000	\$569,000
		06073021304	\$25,200,000	\$25,200,000	\$1,490,000	\$1,490,000
9	La Costa / Campo ²		\$6,420,000	\$18,100,000	\$379,000	\$1,070,000
10	Jacumba ¹		\$2,370,000	\$0	\$140,000	\$0
Subtotal			\$764,000,000	\$773,000,000	\$45,100,000	\$45,600,000
CONSIDERED FOR EXCLUSION						
1	Warm Springs		\$35,100,000	\$35,100,000	\$1,060,000	\$1,060,000
2	Skinner/Johnson		\$2,070,000	\$2,070,000	\$62,500	\$62,500
3	Sage		\$1,070,000	\$1,070,000	\$32,100	\$32,100
4	Wilson Valley		\$4,690,000	\$4,690,000	\$141,000	\$141,000
5	Vail Lake/Oak Mountain		\$3,080,000	\$3,080,000	\$92,900	\$92,900
6	Tule Peak		\$2,070,000	\$2,070,000	\$62,400	\$62,400
7	Bautista		\$4,900,000	\$4,900,000	\$148,000	\$148,000
8	Otay	06073010014	\$3,640,000	\$3,640,000	\$118,000	\$118,000
		06073013313	\$117,000,000	\$117,000,000	\$3,520,000	\$3,520,000
		06073021302	\$37,800	\$37,800	\$2,230	\$2,230
Subtotal			\$173,000,000	\$173,000,000	\$5,240,000	\$5,240,000
TOTAL			\$937,000,000	\$946,000,000	\$50,300,000	\$50,900,000

Note: Totals may not sum due to rounding

(1) The range of forecasts for impacts in Unit 10 appear confusing, since the forecast impacts in the low scenario are greater than the forecast impacts in the high scenario. Total project modification impacts are divided between incremental and baseline impacts. The primary low and high impacts are assigned to the incremental impacts. The low forecasts of baseline impacts are the residuals left over from subtracting the incremental impacts from total impacts.

**EXHIBIT B-3 TOTAL POST-DESIGNATION INCREMENTAL IMPACTS TO RESIDENTIAL
DEVELOPMENT (2008 - 2030, 2008 DOLLARS, THREE PERCENT DISCOUNT
RATE)**

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE (LOW ESTIMATE)	TOTAL PRESENT VALUE (HIGH ESTIMATE)	ANNUALIZED (LOW ESTIMATE)	ANNUALIZED (HIGH ESTIMATE)
2	Skinner/Johnson		\$0	\$0	\$0	\$0
3	Sage		\$0	\$0	\$0	\$0
4	Wilson Valley		\$0	\$0	\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0	\$0	\$0
6	Tule Peak		\$0	\$0	\$0	\$0
7	Bautista		\$0	\$0	\$0	\$0
8	Otay	06073010014	\$0	\$0	\$0	\$0
		06073010015	\$0	\$0	\$0	\$0
		06073013313	\$0	\$0	\$0	\$0
		06073021100	\$0	\$0	\$0	\$0
		06073021302	\$0	\$0	\$0	\$0
		06073021303	\$0	\$0	\$0	\$0
	06073021304	\$0	\$0	\$0	\$0	
9	La Costa / Campo		\$4,120,000	\$22,800,000	\$243,000	\$1,350,000
10	Jacumba		\$7,110,000	\$38,000,000	\$420,000	\$2,240,000
Subtotal			\$11,200,000	\$60,800,000	\$663,000	\$3,590,000
CONSIDERED FOR EXCLUSION						
1	Warm Springs		\$0	\$0	\$0	\$0
2	Skinner/Johnson		\$0	\$0	\$0	\$0
3	Sage		\$0	\$0	\$0	\$0
4	Wilson Valley		\$0	\$0	\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0	\$0	\$0
6	Tule Peak		\$0	\$0	\$0	\$0
7	Bautista		\$0	\$0	\$0	\$0
8	Otay	06073010014	\$0	\$0	\$0	\$0
		06073013313	\$0	\$0	\$0	\$0
		06073021302	\$0	\$0	\$0	\$0
Subtotal			\$0	\$0	\$0	\$0
TOTAL			\$11,200,000	\$60,800,000	\$663,000	\$3,590,000
Note: Totals may not sum due to rounding						

EXHIBIT B-4 TOTAL PRE-DESIGNATION IMPACTS TO NON-RESIDENTIAL DEVELOPMENT (1997
- 2007, 2008 DOLLARS, THREE PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE
2	Skinner/Johnson		\$0
3	Sage		\$0
4	Wilson Valley		\$0
5	Vail Lake/Oak Mountain		\$0
6	Tule Peak		\$0
7	Bautista		\$0
8	Otay	06073010014	\$31,100
		06073010015	\$67,200
		06073013313	\$2,320
		06073021100	\$43,500
		06073021302	\$586,000
		06073021303	\$29,000
		06073021304	\$279,000
9	La Costa / Campo		\$1,810,000
10	Jacumba		\$0
Subtotal			\$2,850,000
CONSIDERED FOR EXCLUSION			
1	Warm Springs		\$0
2	Skinner/Johnson		\$0
3	Sage		\$0
4	Wilson Valley		\$0
5	Vail Lake/Oak Mountain		\$0
6	Tule Peak		\$0
7	Bautista		\$0
8	Otay	06073010014	\$0
		06073013313	\$0
		06073021302	\$0
Subtotal			\$0
TOTAL			\$2,850,000
Note: Totals may not sum due to rounding.			

EXHIBIT B-5 TOTAL POST-DESIGNATION BASELINE IMPACTS TO NON-RESIDENTIAL DEVELOPMENT (2008 - 2030, 2008 DOLLARS, THREE PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE	ANNUALIZED
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0
6	Tule Peak		\$0	\$0
7	Bautista		\$0	\$0
8	Otay	06073010014	\$0	\$0
		06073010015	\$0	\$0
		06073013313	\$0	\$0
		06073021100	\$0	\$0
		06073021302	\$0	\$0
		06073021303	\$0	\$0
		06073021304	\$0	\$0
9	La Costa / Campo		\$1,910,000	\$113,000
10	Jacumba		\$0	\$0
Subtotal			\$1,910,000	\$113,000
CONSIDERED FOR EXCLUSION				
1	Warm Springs		\$2,640,000	\$156,000
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0
6	Tule Peak		\$0	\$0
7	Bautista		\$0	\$0
8	Otay	06073010014	\$13,300	\$783
		06073013313	\$40,500	\$2,390
		06073021302	\$1,700	\$100
Subtotal			\$2,700,000	\$159,000
TOTAL			\$4,610,000	\$272,000
Note: Totals may not sum due to rounding				

EXHIBIT B-6 TOTAL POST-DESIGNATION INCREMENTAL IMPACTS TO NON-RESIDENTIAL DEVELOPMENT (2008 - 2030, 2008 DOLLARS, THREE PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE	ANNUALIZED
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0
6	Tule Peak		\$0	\$0
7	Bautista		\$0	\$0
8	Otay	06073010014	\$0	\$0
		06073010015	\$0	\$0
		06073013313	\$0	\$0
		06073021100	\$0	\$0
		06073021302	\$0	\$0
		06073021303	\$0	\$0
		06073021304	\$0	\$0
9	La Costa / Campo		\$69,100	\$4,080
10	Jacumba		\$0	\$0
Subtotal			\$69,100	\$4,080
CONSIDERED FOR EXCLUSION				
1	Warm Springs		\$4,850	\$287
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0
6	Tule Peak		\$0	\$0
7	Bautista		\$0	\$0
8	Otay	06073010014	\$0	\$0
		06073013313	\$0	\$0
		06073021302	\$0	\$0
Subtotal			\$4,850	\$287
TOTAL			\$74,000	\$4,370
Note: Totals may not sum due to rounding				

EXHIBIT B-7 TOTAL PRE-DESIGNATION IMPACTS TO TRIBES
(1997 - 2007, 2008 DOLLARS, THREE PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	TOTAL PRESENT VALUE
9	La Posta/Campo	\$15,900
TOTAL		\$15,900

EXHIBIT B-8 TOTAL POST-DESIGNATION BASELINE IMPACTS TO TRIBES
(2008 - 2030, 2008 DOLLARS, THREE PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	TOTAL PRESENT VALUE (LOW ESTIMATE)	TOTAL PRESENT VALUE (HIGH ESTIMATE)	ANNUALIZED IMPACTS (LOW ESTIMATE)	ANNUALIZED IMPACTS (HIGH ESTIMATE)
6	Tule Peak	\$0	\$0	\$0	\$0
9	La Posta/Campo ¹	\$19,400,000	\$16,700,000	\$1,150,000	\$987,000
TOTAL		\$19,400,000	\$16,700,000	\$1,150,000	\$987,000

(1) The range of forecasts for impacts in Unit 9 may appear confusing, since the forecast impacts in the low scenario are greater than the forecast impacts in the high scenario. Total project modification impacts are divided between incremental and baseline impacts. The primary low and high impacts are assigned to the incremental impacts. The low forecasts of baseline impacts are the residuals left over from subtracting the incremental impacts from total impacts.

EXHIBIT B-9 TOTAL POST-DESIGNATION INCREMENTAL IMPACTS TO TRIBES
(2008 - 2030, 2008 DOLLARS, THREE PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	PRESENT VALUE (LOW ESTIMATE)	PRESENT VALUE (HIGH ESTIMATE)	ANNUALIZED IMPACTS (LOW ESTIMATE)	ANNUALIZED IMPACTS (HIGH ESTIMATE)
6	Tule Peak	\$0	\$0	\$0	\$0
9	La Posta/Campo	\$7,070,000	\$9,810,000	\$417,000	\$579,000
TOTAL		\$7,070,000	\$9,810,000	\$417,000	\$579,000

EXHIBIT B-10 TOTAL PRE-DESIGNATION IMPACTS TO HABITAT MANAGEMENT AND OTHER ACTIVITIES (1997 - 2007, 2008 DOLLARS, THREE PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE
2	Skinner/Johnson		\$0
3	Sage		\$0
4	Wilson Valley		\$0
5	Vail Lake/Oak Mountain		\$669,000
6	Tule Peak		\$13,000
7	Bautista		\$190,000
8	Otay	06073010014	\$126
		06073010015	\$26,300
		06073013313	\$9
		06073021100	\$1,510
		06073021302	\$286,000
		06073021303	\$118
		06073021304	\$9,420
9	La Costa / Campo		\$76,100
10	Jacumba		\$2,540
Subtotal			\$1,270,000
CONSIDERED FOR EXCLUSION			
1	Warm Springs		\$67,700
2	Skinner/Johnson		\$127,000
3	Sage		\$19,400
4	Wilson Valley		\$76,300
5	Vail Lake/Oak Mountain		\$48,900
6	Tule Peak		\$37,100
7	Bautista		\$33,100
8	Otay	06073010014	\$144,000
		06073013313	\$439,000
		06073021302	\$18,400
Subtotal			\$1,010,000
TOTAL			\$2,290,000
Note: Totals may not sum due to rounding.			

EXHIBIT B-11 TOTAL POST-DESIGNATION BASELINE IMPACTS TO HABITAT MANAGEMENT AND OTHER ACTIVITIES (2008 - 2030, 2008 DOLLARS, THREE PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE	ANNUALIZED
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$167,000	\$9,850
6	Tule Peak		\$37,500	\$2,210
7	Bautista		\$1,430,000	\$84,700
8	Otay	06073010014	\$3,760	\$222
		06073010015	\$64,000	\$3,780
		06073013313	\$280	\$17
		06073021100	\$8,130	\$480
		06073021302	\$679,000	\$40,100
		06073021303	\$3,510	\$207
		06073021304	\$51,600	\$3,050
9	La Costa / Campo		\$166,000	\$9,820
10	Jacumba		\$41,700	\$2,460
Subtotal			\$2,660,000	\$157,000
CONSIDERED FOR EXCLUSION				
1	Warm Springs		\$175,000	\$10,300
2	Skinner/Johnson		\$390,000	\$23,000
3	Sage		\$67,300	\$3,970
4	Wilson Valley		\$212,000	\$12,500
5	Vail Lake/Oak Mountain		\$169,000	\$9,990
6	Tule Peak		\$128,000	\$7,590
7	Bautista		\$115,000	\$6,760
8	Otay	06073010014	\$445,000	\$26,300
		06073013313	\$1,360,000	\$80,300
		06073021302	\$57,100	\$3,370
Subtotal			\$3,120,000	\$184,000
TOTAL			\$5,780,000	\$341,000
Note: Totals may not sum due to rounding				

EXHIBIT B-12 TOTAL POST-DESIGNATION INCREMENTAL IMPACTS TO HABITAT MANAGEMENT AND OTHER ACTIVITIES (2008 - 2030, 2008 DOLLARS, THREE PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	CENSUS TRACT (2000)	TOTAL PRESENT VALUE	ANNUALIZED
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$11,500	\$678
6	Tule Peak		\$547	\$32
7	Bautista		\$0	\$0
8	Otay	06073010014	\$0	\$0
		06073010015	\$1,040	\$62
		06073013313	\$0	\$0
		06073021100	\$53	\$3
		06073021302	\$11,300	\$670
		06073021303	\$0	\$0
		06073021304	\$332	\$20
9	La Costa / Campo		\$3,050	\$180
10	Jacumba		\$0	\$0
Subtotal			\$27,900	\$1,640
CONSIDERED FOR EXCLUSION				
1	Warm Springs		\$0	\$0
2	Skinner/Johnson		\$0	\$0
3	Sage		\$0	\$0
4	Wilson Valley		\$0	\$0
5	Vail Lake/Oak Mountain		\$0	\$0
6	Tule Peak		\$0	\$0
7	Bautista		\$0	\$0
8	Otay	06073010014	\$0	\$0
		06073013313	\$0	\$0
		06073021302	\$0	\$0
Subtotal			\$0	\$0
TOTAL			\$27,900	\$1,640
Note: Totals may not sum due to rounding				

APPENDIX C | DETAILED IMPACTS TO ACTIVITIES BY UNIT

This appendix provides details of the undiscounted impacts by year for each activity. These details are provided in accordance with OMB guidelines for developing benefit and cost estimates. OMB directs the analysis to: “include separate schedules of the monetized benefits and costs that show the type and timing of benefits and costs, and express the estimates in this table in constant, undiscounted dollars.”²⁵⁴ For this analysis, this applies to the cost estimates for future years. Circular A-4 directs that future estimates of value should be presented in undiscounted terms. This is an important way to clarify future costs. For example, if a program will cost \$10,000 ten years in the future, that future cost estimate should be noted as such to clarify what the cost estimate is in that year.

²⁵⁴ Office of Management and Budget, Circular A-4, September 17, 2003, p. 18). The reference to “constant” dollars indicates that the effects of general price level inflation (the tendency of all prices to increase over time) should be removed through the use of an inflation adjustment index.

EXHIBIT C-1. UNDISCOUNTED IMPACTS BY ACTIVITY AND YEAR, UNITS NOT CONSIDERED FOR EXCLUSION

YEAR	RESIDENTIAL DEVELOPMENT IMPACTS		NON-RESIDENTIAL DEVELOPMENT IMPACTS		TRIBAL IMPACTS		HABITAT MANAGEMENT IMPACTS		TOTAL IMPACTS	
	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE
PRE-DESIGNATION UNDISCOUNTED IMPACTS										
1998	\$0	\$0	\$153,000	\$153,000	\$0	\$0	\$83,000	\$83,000	\$236,000	\$236,000
1999	\$0	\$0	\$153,000	\$153,000	\$0	\$0	\$83,000	\$83,000	\$236,000	\$236,000
2000	\$0	\$0	\$168,000	\$168,000	\$0	\$0	\$106,000	\$106,000	\$274,000	\$274,000
2001	\$14,315	\$14,315	\$586,333	\$586,333	\$0	\$0	\$131,000	\$131,000	\$717,333	\$717,333
2002	\$0	\$0	\$153,000	\$153,000	\$0	\$0	\$116,000	\$116,000	\$283,315	\$283,315
2003	\$148,065,253	\$148,065,253	\$168,000	\$168,000	\$0	\$0	\$116,000	\$116,000	\$284,000	\$284,000
2004	\$1,519,731	\$1,519,731	\$153,000	\$153,000	\$0	\$0	\$116,000	\$116,000	\$148,334,253	\$148,334,253
2005	\$1,519,731	\$1,519,731	\$168,000	\$168,000	\$0	\$0	\$119,528	\$119,528	\$1,807,259	\$1,807,259
2006	\$3,787,731	\$3,787,731	\$153,000	\$153,000	\$15,000	\$15,000	\$116,528	\$116,528	\$1,804,259	\$1,804,259
2007	\$0	\$0	\$593,000	\$593,000	\$0	\$0	\$98,456	\$98,456	\$4,479,187	\$4,479,187
POST-DESIGNATION UNDISCOUNTED BASELINE IMPACTS										
2008	\$3,570,680	\$4,120,279	\$1,830,000	\$1,830,000	\$842,010	\$683,283	\$382,162	\$382,162	\$6,624,851	\$7,015,723
2009	\$5,070,239	\$5,619,838	\$0	\$0	\$842,010	\$683,283	\$195,713	\$195,713	\$6,107,962	\$6,498,833
2010	\$130,842,472	\$131,392,071	\$87,776	\$87,776	\$4,126,385	\$3,967,658	\$259,622	\$259,622	\$135,316,255	\$135,707,127
2011	\$45,065,930	\$45,630,529	\$0	\$0	\$1,211,385	\$1,052,658	\$159,622	\$159,622	\$46,436,936	\$46,842,808
2012	\$45,065,930	\$45,615,529	\$0	\$0	\$1,196,385	\$1,037,658	\$127,622	\$127,622	\$46,389,936	\$46,780,808
2013	\$45,065,930	\$45,615,529	\$0	\$0	\$1,196,385	\$1,037,658	\$137,622	\$137,622	\$46,399,936	\$46,790,808
2014	\$45,065,930	\$45,615,529	\$0	\$0	\$1,211,385	\$1,052,658	\$125,312	\$125,312	\$46,402,626	\$46,793,498
2015	\$45,065,930	\$45,615,529	\$0	\$0	\$1,196,385	\$1,037,658	\$125,312	\$125,312	\$46,387,626	\$46,778,498
2016	\$45,065,930	\$45,630,529	\$0	\$0	\$1,196,385	\$1,037,658	\$125,312	\$125,312	\$46,387,626	\$46,793,498
2017	\$45,065,930	\$45,615,529	\$0	\$0	\$1,211,385	\$1,052,658	\$125,312	\$125,312	\$46,402,626	\$46,793,498
2018	\$45,065,930	\$45,615,529	\$0	\$0	\$827,010	\$668,283	\$150,312	\$150,312	\$46,043,251	\$46,434,123
2019	\$45,080,930	\$45,615,529	\$0	\$0	\$842,010	\$683,283	\$125,312	\$125,312	\$46,048,251	\$46,424,123
2020	\$45,065,930	\$45,615,529	\$0	\$0	\$827,010	\$668,283	\$125,312	\$125,312	\$46,018,251	\$46,409,123
2021	\$45,065,930	\$45,615,529	\$0	\$0	\$842,010	\$683,283	\$125,312	\$125,312	\$46,033,251	\$46,424,123
2022	\$45,065,930	\$45,630,529	\$0	\$0	\$827,010	\$668,283	\$125,312	\$125,312	\$46,018,251	\$46,424,123
2023	\$45,065,930	\$45,615,529	\$0	\$0	\$827,010	\$668,283	\$135,312	\$135,312	\$46,028,251	\$46,419,123
2024	\$45,065,930	\$45,615,529	\$0	\$0	\$842,010	\$683,283	\$125,312	\$125,312	\$46,033,251	\$46,424,123

YEAR	RESIDENTIAL DEVELOPMENT IMPACTS		NON-RESIDENTIAL DEVELOPMENT IMPACTS		TRIBAL IMPACTS		HABITAT MANAGEMENT IMPACTS		TOTAL IMPACTS	
	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE
2025	\$45,065,930	\$45,615,529	\$0	\$0	\$827,010	\$668,283	\$125,312	\$125,312	\$46,018,251	\$46,409,123
2026	\$45,065,930	\$45,615,529	\$0	\$0	\$827,010	\$668,283	\$125,312	\$125,312	\$46,018,251	\$46,409,123
2027	\$45,065,930	\$45,630,529	\$0	\$0	\$842,010	\$683,283	\$125,312	\$125,312	\$46,033,251	\$46,439,123
2028	\$45,065,930	\$45,615,529	\$0	\$0	\$827,010	\$668,283	\$150,312	\$150,312	\$46,043,251	\$46,434,123
2029	\$45,065,930	\$45,615,529	\$0	\$0	\$827,010	\$668,283	\$125,312	\$125,312	\$46,018,251	\$46,409,123
2030	\$45,065,930	\$45,615,529	\$0	\$0	\$842,010	\$683,283	\$125,312	\$125,312	\$46,033,251	\$46,424,123
POST-DESIGNATION UNDISCOUNTED INCREMENTAL IMPACTS										
2008	\$660,965	\$3,596,132	\$0	\$0	\$416,207	\$589,935	\$5,000	\$5,000	\$1,082,172	\$4,191,066
2009	\$660,965	\$3,576,132	\$0	\$0	\$431,207	\$574,935	\$9,520	\$9,520	\$1,101,692	\$4,160,586
2010	\$660,965	\$3,596,132	\$73,304	\$73,304	\$411,207	\$584,935	\$476	\$476	\$1,145,952	\$4,254,846
2011	\$660,965	\$3,601,132	\$0	\$0	\$416,207	\$574,935	\$476	\$476	\$1,077,648	\$4,176,543
2012	\$660,965	\$3,576,132	\$0	\$0	\$411,207	\$584,935	\$476	\$476	\$1,072,648	\$4,161,543
2013	\$660,965	\$3,576,132	\$0	\$0	\$426,207	\$569,935	\$476	\$476	\$1,087,648	\$4,146,543
2014	\$660,965	\$3,616,132	\$0	\$0	\$416,207	\$589,935	\$476	\$476	\$1,077,648	\$4,206,543
2015	\$660,965	\$3,576,132	\$0	\$0	\$411,207	\$569,935	\$476	\$476	\$1,072,648	\$4,146,543
2016	\$660,965	\$3,581,132	\$0	\$0	\$411,207	\$569,935	\$476	\$476	\$1,072,648	\$4,151,543
2017	\$660,965	\$3,596,132	\$0	\$0	\$431,207	\$589,935	\$476	\$476	\$1,092,648	\$4,186,543
2018	\$660,965	\$3,596,132	\$0	\$0	\$411,207	\$569,935	\$5,476	\$5,476	\$1,077,648	\$4,171,543
2019	\$705,965	\$3,596,132	\$0	\$0	\$416,207	\$589,935	\$476	\$476	\$1,122,648	\$4,186,543
2020	\$660,965	\$3,576,132	\$0	\$0	\$411,207	\$569,935	\$476	\$476	\$1,072,648	\$4,146,543
2021	\$660,965	\$3,596,132	\$0	\$0	\$431,207	\$574,935	\$476	\$476	\$1,092,648	\$4,171,543
2022	\$660,965	\$3,601,132	\$0	\$0	\$411,207	\$584,935	\$476	\$476	\$1,072,648	\$4,186,543
2023	\$660,965	\$3,576,132	\$0	\$0	\$411,207	\$569,935	\$476	\$476	\$1,072,648	\$4,146,543
2024	\$660,965	\$3,596,132	\$0	\$0	\$416,207	\$589,935	\$476	\$476	\$1,077,648	\$4,186,543
2025	\$660,965	\$3,576,132	\$0	\$0	\$426,207	\$569,935	\$476	\$476	\$1,087,648	\$4,146,543
2026	\$660,965	\$3,596,132	\$0	\$0	\$411,207	\$584,935	\$476	\$476	\$1,072,648	\$4,181,543
2027	\$660,965	\$3,601,132	\$0	\$0	\$416,207	\$574,935	\$476	\$476	\$1,077,648	\$4,176,543
2028	\$660,965	\$3,576,132	\$0	\$0	\$411,207	\$584,935	\$5,476	\$5,476	\$1,077,648	\$4,166,543
2029	\$660,965	\$3,576,132	\$0	\$0	\$426,207	\$569,935	\$476	\$476	\$1,087,648	\$4,146,543
2030	\$660,965	\$3,596,132	\$0	\$0	\$416,207	\$589,935	\$476	\$476	\$1,077,648	\$4,186,543

EXHIBIT C-2. UNDISCOUNTED IMPACTS BY ACTIVITY AND YEAR, UNITS CONSIDERED FOR EXCLUSION

YEAR	RESIDENTIAL DEVELOPMENT IMPACTS		NON-RESIDENTIAL DEVELOPMENT IMPACTS		TRIBAL IMPACTS		HABITAT MANAGEMENT IMPACTS		TOTAL IMPACTS	
	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE
PRE-DESIGNATION UNDISCOUNTED IMPACTS										
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$32,430,800	\$32,430,800	\$0	\$0	\$0	\$0	\$0	\$0	\$32,430,800	\$32,430,800
2001	\$200,000	\$200,000	\$0	\$0	\$0	\$0	\$20,600	\$20,600	\$220,600	\$220,600
2002	\$200,685	\$200,685	\$0	\$0	\$0	\$0	\$54,719	\$54,719	\$255,405	\$255,405
2003	\$200,000	\$200,000	\$0	\$0	\$0	\$0	\$158,683	\$158,683	\$358,683	\$358,683
2004	\$7,289,119	\$7,289,119	\$0	\$0	\$0	\$0	\$162,095	\$162,095	\$7,451,215	\$7,451,215
2005	\$72,762	\$72,762	\$0	\$0	\$0	\$0	\$165,605	\$165,605	\$238,368	\$238,368
2006	\$72,762	\$72,762	\$0	\$0	\$0	\$0	\$183,597	\$183,597	\$256,359	\$256,359
2007	\$72,762	\$72,762	\$0	\$0	\$0	\$0	\$172,794	\$172,794	\$245,556	\$245,556
POST-DESIGNATION UNDISCOUNTED BASELINE IMPACTS										
2008	\$10,225,715	\$10,225,715	\$0	\$0	\$0	\$0	\$174,534	\$174,534	\$10,400,249	\$10,400,249
2009	\$10,225,715	\$10,225,715	\$2,115,000	\$2,115,000	\$0	\$0	\$183,348	\$183,348	\$12,524,063	\$12,524,063
2010	\$10,225,715	\$10,225,715	\$625,000	\$625,000	\$0	\$0	\$187,365	\$187,365	\$11,038,080	\$11,038,080
2011	\$10,225,715	\$10,225,715	\$0	\$0	\$0	\$0	\$197,183	\$197,183	\$10,422,897	\$10,422,897
2012	\$10,225,715	\$10,225,715	\$0	\$0	\$0	\$0	\$176,480	\$176,480	\$10,402,194	\$10,402,194
2013	\$10,225,715	\$10,225,715	\$0	\$0	\$0	\$0	\$179,948	\$179,948	\$10,405,662	\$10,405,662
2014	\$10,225,715	\$10,225,715	\$0	\$0	\$0	\$0	\$182,210	\$182,210	\$10,407,924	\$10,407,924
2015	\$10,225,715	\$10,225,715	\$4,000	\$4,000	\$0	\$0	\$192,164	\$192,164	\$10,421,878	\$10,421,878
2016	\$10,225,715	\$10,225,715	\$4,000	\$4,000	\$0	\$0	\$192,183	\$192,183	\$10,421,898	\$10,421,898
2017	\$10,225,715	\$10,225,715	\$4,000	\$4,000	\$0	\$0	\$181,002	\$181,002	\$10,410,717	\$10,410,717
2018	\$10,225,715	\$10,225,715	\$4,000	\$4,000	\$0	\$0	\$177,726	\$177,726	\$10,407,441	\$10,407,441
2019	\$10,225,715	\$10,225,715	\$4,000	\$4,000	\$0	\$0	\$184,704	\$184,704	\$10,414,419	\$10,414,419
2020	\$10,225,715	\$10,225,715	\$6,000	\$6,000	\$0	\$0	\$197,112	\$197,112	\$10,428,827	\$10,428,827
2021	\$10,225,715	\$10,225,715	\$6,000	\$6,000	\$0	\$0	\$195,929	\$195,929	\$10,427,644	\$10,427,644
2022	\$10,225,715	\$10,225,715	\$6,000	\$6,000	\$0	\$0	\$181,007	\$181,007	\$10,412,722	\$10,412,722
2023	\$10,225,715	\$10,225,715	\$6,000	\$6,000	\$0	\$0	\$179,327	\$179,327	\$10,411,042	\$10,411,042
2024	\$10,225,715	\$10,225,715	\$6,000	\$6,000	\$0	\$0	\$184,646	\$184,646	\$10,416,361	\$10,416,361

YEAR	RESIDENTIAL DEVELOPMENT IMPACTS		NON-RESIDENTIAL DEVELOPMENT IMPACTS		TRIBAL IMPACTS		HABITAT MANAGEMENT IMPACTS		TOTAL IMPACTS	
	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE	LOW ESTIMATE	HIGH ESTIMATE
2025	\$10,225,715	\$10,225,715	\$6,000	\$6,000	\$0	\$0	\$183,032	\$183,032	\$10,414,747	\$10,414,747
2026	\$10,225,715	\$10,225,715	\$6,000	\$6,000	\$0	\$0	\$180,377	\$180,377	\$10,412,092	\$10,412,092
2027	\$10,225,715	\$10,225,715	\$6,000	\$6,000	\$0	\$0	\$180,377	\$180,377	\$10,412,092	\$10,412,092
2028	\$10,225,715	\$10,225,715	\$6,000	\$6,000	\$0	\$0	\$180,377	\$180,377	\$10,412,092	\$10,412,092
2029	\$10,225,715	\$10,225,715	\$6,000	\$6,000	\$0	\$0	\$180,377	\$180,377	\$10,412,092	\$10,412,092
2030	\$10,225,715	\$10,225,715	\$6,000	\$6,000	\$0	\$0	\$180,377	\$180,377	\$10,412,092	\$10,412,092
POST-DESIGNATION UNDISCOUNTED INCREMENTAL IMPACTS										
2008	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2009	\$0	\$0	\$5,000	\$5,000	\$0	\$0	\$0	\$0	\$5,000	\$5,000
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2011	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2012	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2013	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2016	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2017	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2018	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2020	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2021	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2024	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2025	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2027	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2028	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2029	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2030	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

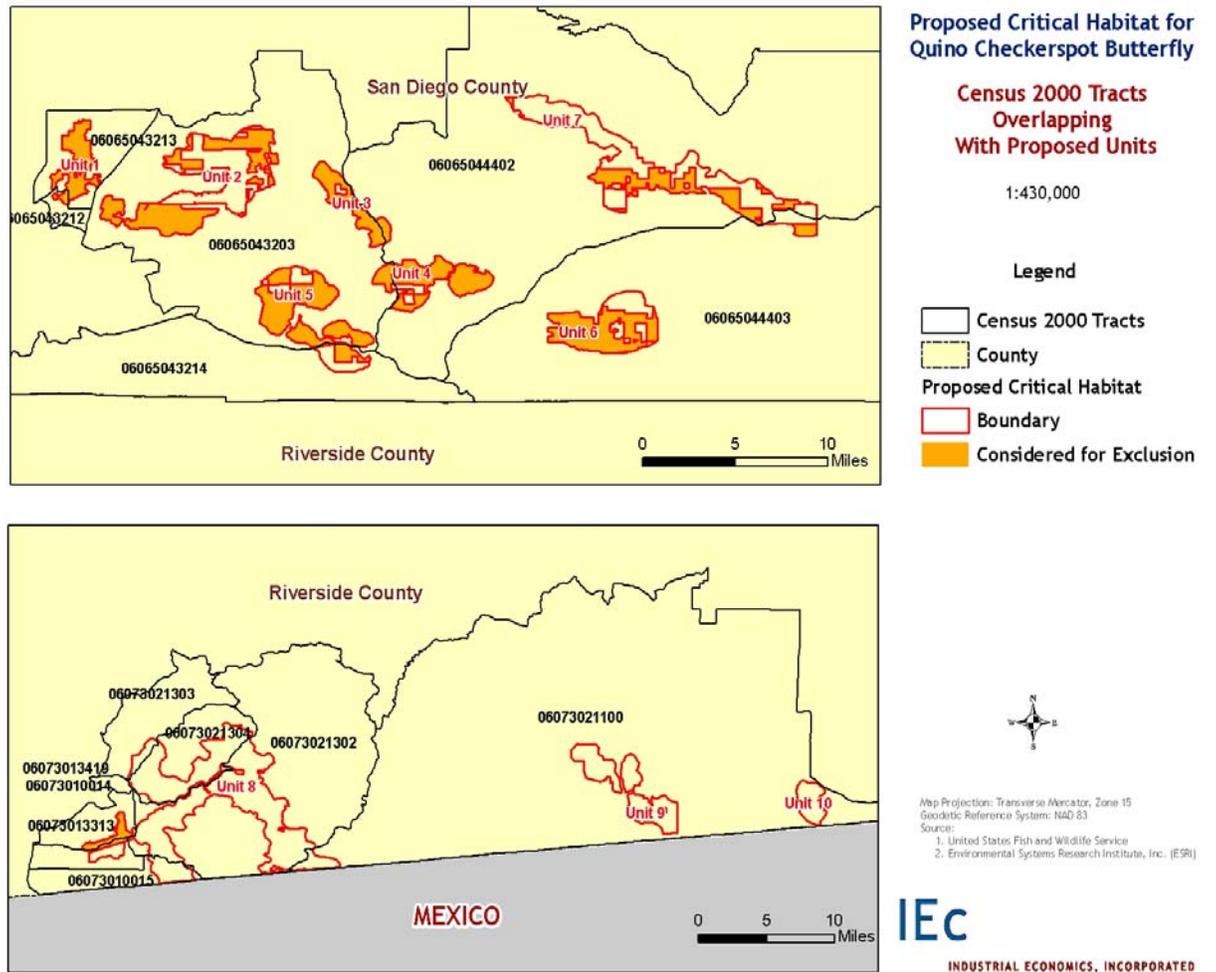
APPENDIX D | SELECTION OF LEVEL OF DISAGGREGATION FOR REPORTING RESULTS

D.1 CRITICAL HABITAT UNITS VERSUS TRACTS

291. This appendix explains why the report presents impacts for units 1-7, 9, and 10 at the unit level and reports impacts for unit 8 at the census tract level. Impacts are presented in this way in order to specify the smallest geographic area possible for which impacts can be estimated, consistent with the Act.²⁵⁵ This provides the Service with more finely delineated data with which it can make decisions regarding designation and exclusion.
292. The analysis presents impacts geographically by critical habitat unit, except for Unit 8, which is broken down into smaller subunits using census tracts. Exhibit D-1 is a map of the proposed critical habitat, showing the boundaries for units and census tracts. Units 1, 2, 6, 9, and 10 are smaller than the census tracts that contain them; therefore a finer spatial resolution is provided by presenting results at the unit level. Units 3, 4, 5, and 7 each span two tracts that contain other units; presentation of results at the unit level for these units provides a finer scale of resolution and avoids the potential confusion of attributing impacts among shared tracts. Impacts for Unit 8, which is larger than the other units and spans several census tracts can be broken down by tract. Breaking this unit down by tract makes it possible to provide a smaller unit of analysis for the land within unit 8. A finer level of scale resolution provides greater site-specific cost information and thus greater regulatory flexibility. This method is particularly suited to development impacts which are estimated at the census tract level as a result of the development modeling tools used.
293. Specific tract-level estimates are not available for other activities. Therefore, impacts that affect Unit 8 in general are distributed across the tracts, weighted by the relative size of the habitat within the tract. For example, the tract with the most proposed critical habitat in Unit 8 is assigned the greatest share of habitat management costs. Tract area percentages and corresponding economic impacts are estimated separately for areas proposed for designation and areas considered for exclusion.

²⁵⁵ Section 4(b)(2) of the Act allows the Service to exclude areas proposed for designation based on economic and other relevant impacts. Consideration of impacts at the tract and unit level may result in alternate combinations of potential habitat that may or may not ultimately be designated as critical habitat. As a result, the impacts of multiple combinations of potential habitat are also available to the Service.

EXHIBIT D-1 PROPOSED CRITICAL HABITAT UNITS AND OVERLAPPING CENSUS TRACTS



APPENDIX E | TECHNICAL INFORMATION FOR IMPACTS ON URBAN DEVELOPMENT

294. This appendix is provided to give more detail concerning the estimated residential development impacts. The first section explains the procedure for projecting household, population, and acre growth in the areas of critical habitat. Next, the analysis explains how economic values were forecast based on these projections.

E.1 PROJECTED DEVELOPMENT IN PROPOSED CRITICAL HABITAT

295. This section of the appendix explains how the analysis projects household, population, and acreage growth in the areas of critical habitat. Specifically, this section of the report explains the analysis behind Exhibit 4-3.

E.1.1 SCAG AND SANDAG PROJECTIONS

296. To determine the increase in the number of new houses within critical habitat, census tracts are used as the geographic unit of analysis. The census tract is the finest level of distinction at which the applicable data are published. Predicting growth at the smallest geographic unit possible is important because local or even neighborhood-level characteristics can be responsible for a high degree of heterogeneity in the effects of habitat conservation. A unit-level analysis may not be sensitive enough to discern any noticeable effects even though the effects are large on a smaller scale.

297. The primary sources for the estimates of future housing and population were the study area's federally designated Metropolitan Planning Organizations (MPOs). The MPO demographic forecasts are widely recognized as one of the best sources for growth estimates because they are created using detailed knowledge about local growth trends and characteristics. Due to their use inclusion of highly localized information, these forecasts may be more accurate than those obtained with mathematical forecasting models. The MPOs that created the estimates used in this analysis are SCAG, the Southern California Association of Governments, and SANDAG, the San Diego Association of Governments.

E.1.2 BEC GROWTH ALLOCATION MODEL

298. While SCAG and SANDAG provide growth projections for each census tract, it is also necessary to spatially allocate this growth within the census tract. It is important not to assume growth will occur uniformly within each census tract because such an assumption, which is almost always untrue would cause a mis-attribution of development

for the proposed critical habitat. This would happen because the boundary of critical habitat does not usually match that of census tracts. Certain areas of proposed critical habitat may be unsuitable for development; conserving this habitat will not result in any additional costs. The assumption of uniform development would erroneously attribute development (and conservation costs) to these areas. Conversely, conserved habitat may occupy the last portions of undeveloped land within a tract, meaning the majority of future development in a census tract will be projected to occur within the species' habitat. These scenarios illustrate the need for more precise growth allocation.

299. Allocating growth within each census tract requires modeling the process of the conversion of undeveloped land into an urban landscape (which the analysis refers to as “Greenfield development”). This analysis utilizes a growth allocation model created by Berkeley Economic Consulting.
300. This statistical model incorporates both spatial and non-spatial data to project urban growth in California. Its explanatory variables include demand variables, pertaining to job accessibility and income level; location-specific variables, such as freeway proximity, whether the land is classified as farmland, and whether it lies in a flood-plain; neighborhood variables, modeling the geography of a location's neighbors; and regulatory variables, such as whether a location is in an incorporated city.
301. The land use forecasting model analyzes the state by dividing it into a matrix of grid cells. It outputs a probabilistic score (between 0 and 1) that a given cell will be converted from undeveloped to developed within the next 23 years. For each census tract, the sum of the probabilistic scores within the critical habitat area is divided by the sum of the probabilistic scores within the census tract to determine the share of development within the tract that is projected to occur within the area of critical habitat.

E.2 VALUE OF DEVELOPED LAND

302. The next step for estimating conservation impacts for residential development involves using the current value of developed land to estimate a value for undeveloped land, and then applying these values to the development forecast in the previous section.
303. The current value of developed land is estimated by evaluating the following equation:

$$v = \frac{p - k}{\lambda}$$

This equation implies that the value of developed land (v) is equal to the difference between the selling price of a new house (p) and the cost of developing the new house (k), divided by (λ), the inverse density (acres per house). The result is the per acre dollar value of the lot with no structures on it. This value is called the extensive margin value.

304. Data on the selling prices of new homes were obtained from DataQuick Information Systems, which maintains a database of new home transactions in the study area. Based on information gathered from county recorders and assessors, the database provides a rich

set of house descriptors, including assessor's parcel number, census tract, home size, lot size, number of stories, number of bedrooms, number of bathrooms, build year, sale price, and sale date for all transactions dating back to 1997. Each observation is spatially referenced by census tract using a geographic information system (GIS).

305. Because California home prices have roughly tripled in the past decade, the nominal sale prices reported by DataQuick are not directly comparable across time. The prices were inflated to real dollars using the Office of Federal Housing Enterprise Oversight's home price index. This index provides quarterly data on price inflation for detached, single-family dwellings by metropolitan statistical area (MSA).
306. The cost of development includes construction costs, design costs, and local development impact fees. Construction costs include labor and materials. Design costs include architecture, grading, utilities, provision of common space. Development impact fees include utility hookup charges and other local charges. Data on the cost of construction was obtained from Marshall & Swift, which publishes a quarterly guide to building cost per square foot indexed by region, construction quality (average, good, very good, or excellent), and home size. New homes were assumed to be one story, stud-framed with stucco siding and of either average or good construction quality, which is typical for newly constructed tract homes. The design cost is assumed to be equal to twenty percent of the cost of construction. Development impact fees (which include local fees such as utility hookups and are included in the cost of house development, "k") were collected from the engineering and planning departments of the closest cities to where critical habitat is proposed.
307. The inverse density of development (acres per house) was estimated in each census tract to be the number of acres projected for development divided by the number of houses projected to be built. Both of these variables were obtained from the SCAG and SANDAG projections.
308. All of this information was then used to calculate the extensive margin value of a lot in each tract. These values were then used in Chapter 4 to calculate the opportunity costs of development delays waiting for regulatory approval and the opportunity cost of avoidance, where no structures are allowed to be built. Since extensive margin values can be calculated from observations on existing houses and price information for vacant lots is much more difficult to obtain, the extensive margin values were used to predict land values in the future. The future extensive margin values for projected development were forecast to be equal to the current values, but discounted across the number of years before that development is projected to take place. In that way, projected development was given its appropriate price, but discounted to make the future development values comparable to current values.

Annualized Impacts

309. Annualizations take the total amount of expenditure over a period of time and calculates a yearly amount that, when summed and discounted, will equal the total amount. For conservation expenditures over 23 years this is straightforward. The annualized amount is specific to the time period of the expenditures.
310. For property value impacts, annualization is more complicated. The current price of property is a perpetuity that captures the market's summation of the total stream of benefits a property may produce in the future. There is not set time for a perpetuity. An annualized value, calculated like the annualized value for expenditures, above, would assign a fixed time horizon for a market value, which is an incorrect approximation of the value the market assigns.
311. To correctly address the annualized values due to property value losses (due to development avoidance in the Chula Vista Subarea Plan and the MSHCP), this analysis uses the annuity value for the property value perpetuity to capture the annual value associated with a property value loss. This annuity value is then added to the annualized value for expenditures for activities like species management (where the annualized value is correctly used). The sum of the annualized values are reported in the Executive Summary and Appendix B, for the proposed critical habitat units that are considered for exclusion and subject to development avoidance under their respective HCPs.