IEc

ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE LAGUNA MOUNTAINS SKIPPER

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prepared for:

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EXECUTIVE SUMMARY

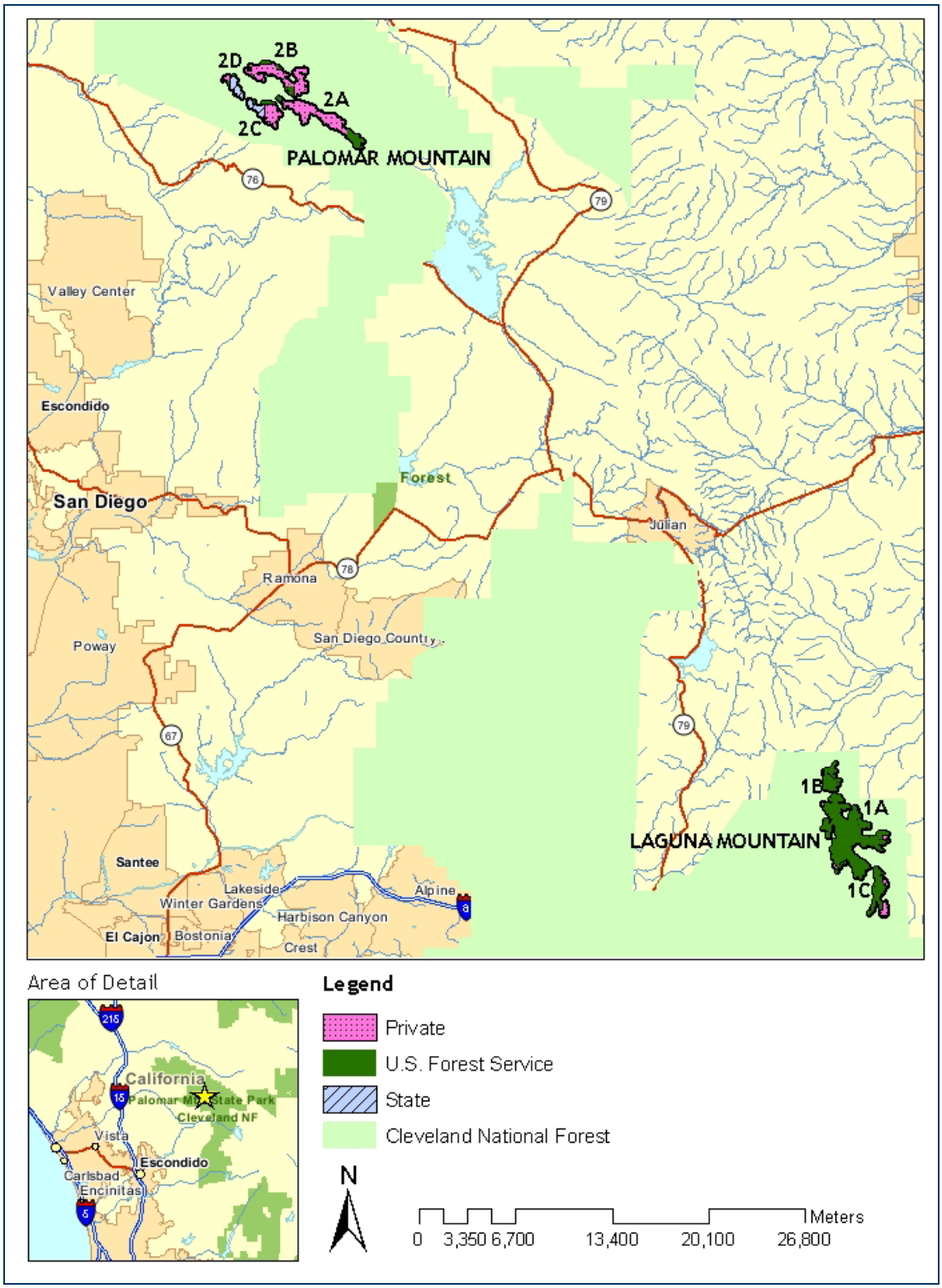
INTRODUCTION

1. The purpose of this report is to identify and analyze the potential economic impacts associated with the proposed critical habitat designation for the *Pyrgus ruralis lagunae* (laguna mountains skipper, referred to as the "skipper"). This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service's (Service) Division of Economics.

2. On January 16, 1997, the Service published the final rule listing the skipper as endangered. On December 13, 2005, the Service published the proposed critical habitat designation ("proposed rule") addressed in this report.[1] The Service proposed 6,662 acres of critical habitat in San Diego County in California across two units (divided into seven subunits). Of the total area proposed for designation, 58 percent are Federal lands, six percent are State lands, and the remaining 36 percent are private lands. Exhibit ES-1 shows the location of each subunit.

[1] 70 FR 73699

EXHIBIT ES-1 PROPOSED CRITICAL HABITAT DESIGNATION FOR THE SKIPPER



3. Exhibit ES-2 summarizes key findings of the economic analysis. Total future impacts are presented by subunit in Exhibit ES-3. Exhibits ES-4 and ES-5 show the distribution of impacts by affected activity. For a summary of past costs by subunit, see Appendix B.

EXHIBIT ES-2

KEY FINDINGS

Total future impacts: Total future impacts for all activities over the next 20 years range from $8.0 to $10.3 million (undiscounted). Present value future costs are estimated to be $4.6 million to $5.9 million over this same time period ($436,000 to $557,000 on an annualized basis) using a real rate of seven percent, or $6.2 million to $7.9 million ($416,000 to $533,000 on an annualized basis) using a real rate of three percent.[2]

In summary:

- Skipper conservation activities are likely to primarily impact recreational camping in Cleveland National Forest (CNF). Significant uncertainty exists regarding the magnitude of impact to this activity resulting from the closure of campgrounds and reduced capacity at other campsites in proposed critical habitat. As a result, the analysis applies two methodologies to bound the range of potential costs. The lower-bound estimate assumes that campers' welfare is unaffected, because numerous, equally valuable substitute campsites exist. The upper-bound estimate assumes that camping trips that would have been taken to closed sites are foregone and not substituted elsewhere. The actual impact likely falls between these two bounds. Assuming the probability distribution of impacts between these bounds is continuous, and the distribution is not skewed toward either bound, the average of the two estimates represents the best estimate of camping impacts.
- The low-end estimate of costs assumes grazing on private lands is not affected and biologists' time onsite during utility repairs and maintenance is limited to one day per project. Costs under this estimate are dominated by welfare losses to campers in Subunits 1A and 1C.
- The high-end estimate of costs assumes grazing activities on private lands in proposed critical habitat will be restricted and that utility projects will last longer than a single day. Costs under this estimate are dominated by lost camping opportunities and to a lesser extent costs to utilities.

Units most impacted: In the low-end estimate, 92 percent of the costs are associated with Subunits 1A and 1C. In the high-end estimate, Subunits 1A and 1C again dominates total costs, accounting for 82 percent of total estimated impacts.

[2] The low and high cost estimates presented for non-camping activities result from analyzing the impacts of two distinct regulatory scenarios (e.g., grazing on private lands either is or is not restricted). Because the probability distribution of costs between scenarios is not likely to be continuous, it is not appropriate to assume that the average of the two estimates represents a best estimate.

EXHIBIT ES-3 FUTURE IMPACTS (2006 - 2025) TO ALL ACTIVITIES BY SUBUNIT

UNIT	SUBUNIT	UNDISCOUNTED		PRESENT VALUE, 3%		PRESENT VALUE, 7%	
		LOW	HIGH	LOW	HIGH	LOW	HIGH
1	A. Laguna Meadow	$4,816,000	$5,912,000	$3,712,000	$4,552,000	$2,769,000	$3,390,000
	B. Filaree Flat	$166,000	$174,000	$130,000	$136,000	$99,000	$104,000
	C. Agua Dulce Campground & Horse Meadow	$2,549,000	$2,557,000	$1,958,000	$1,964,000	$1,454,000	$1,458,000
2	A. Mendenhall Valley & Observatory Campground	$223,000	$874,000	$175,000	$678,000	$133,000	$510,000
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	$176,000	$665,000	$136,000	$510,000	$101,000	$378,000
	C. Upper Doane Valley & Girl Scout Camp	$87,000	$87,000	$67,000	$67,000	$50,000	$50,000
	D. Lower French Valley & Lower Doane Valley	$25,000	$25,000	$19,000	$19,000	$14,000	$14,000
TOTAL:		**$8,041,000**	**$10,292,000**	**$6,196,000**	**$7,925,000**	**$4,619,000**	**$5,903,000**

Note: Totals may not sum due to rounding.

EXHIBIT ES-4 RELATIVE FUTURE IMPACT BY ACTIVITY: LOW ESTIMATE (UNDISCOUNTED)[3]

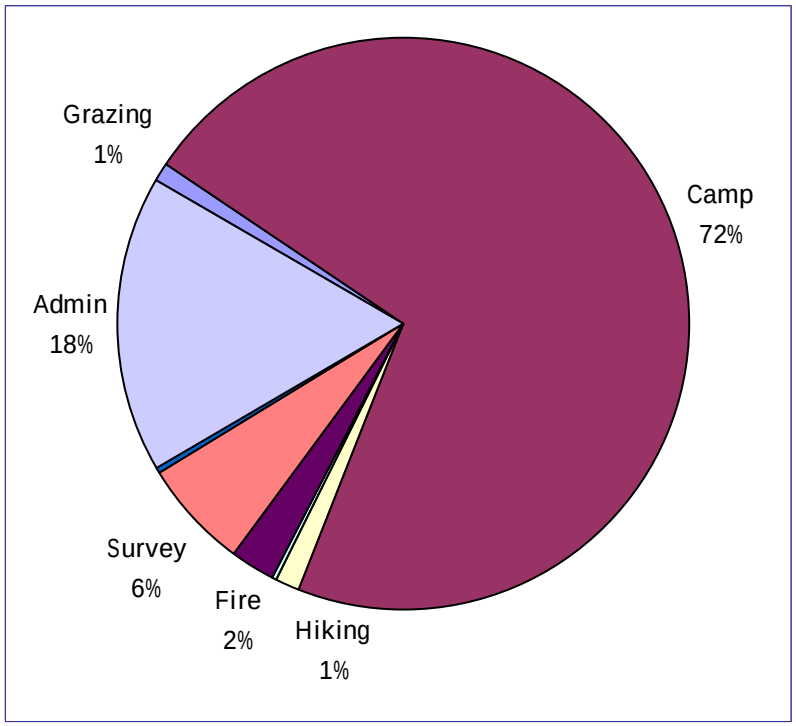
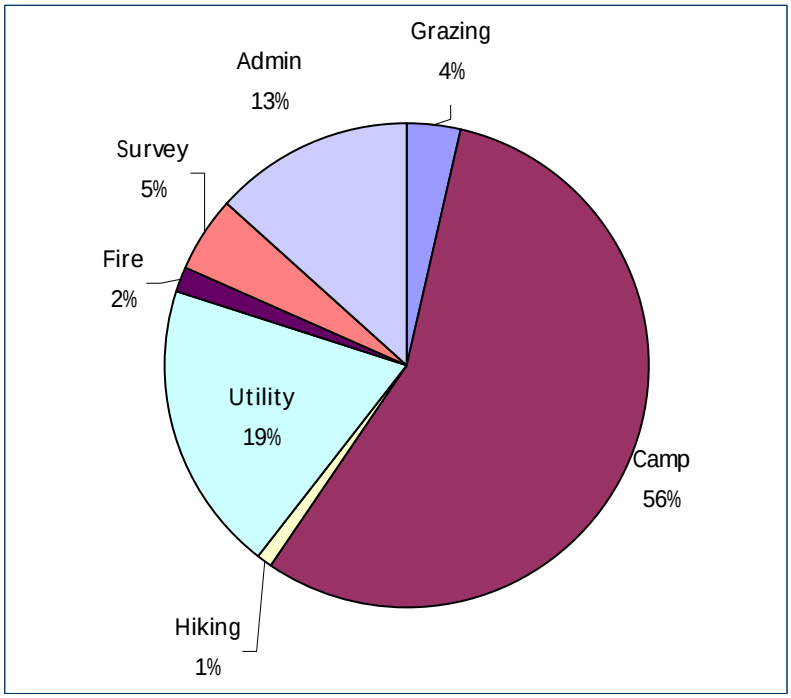


EXHIBIT ES-5 RELATIVE FUTURE IMPACT BY ACTIVITY: HIGH ESTIMATE (UNDISCOUNTED)



[3] The relative magnitude of effect on each type of activity is not significantly different for the low and high present value impact estimates.

Future costs are presented on an annualized basis below in Exhibit ES-6. The remainder of the Executive Summary describes in greater detail the framework for this analysis, the estimation of costs by affected activity, and the designated areas most likely to experience impacts.

EXHIBIT ES-6 ANNUALIZED COSTS OF PROPOSED CRITICAL HABITAT

ANNUALIZED, 3%		ANNUALIZED, 7%	
LOW	HIGH	LOW	HIGH
$416,000	$533,000	$436,000	$557,000

FRAMEWORK FOR THE ANALYSIS AND REGULATORY ALTERNATIVES CONSIDERED

4. Section 4(b)(2) of the Endangered Species Act (Act) requires the Service to designate critical habitat on the basis of the best scientific data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.[4] In addition, this analysis provides information to allow 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)[5] This report also complies with direction from the U.S. 10th Circuit Court of Appeals that, when deciding which areas to designate as critical habitat, the economic analysis informing that decision should include "co-extensive" effects.[6]

5. Executive Order 12866 directs Federal Agencies to evaluate regulatory alternatives. The Service identifies seven subunits for designation as critical habitat. Section 4(b)(2) of the Act allows the Service to exclude areas proposed for designation based on economic impact and other relevant impact. Consideration of impacts at a subunit level may result in alternate combinations of habitat that may or may not ultimately be designated as critical habitat. As a result, the impacts of multiple combinations of proposed critical habitat are available to the Service.

6. This analysis considers the potential economic impacts of efforts to protect the skipper and its habitat (hereinafter referred to collectively as "skipper conservation activities") in potential critical habitat. It does so by taking into account the cost of conservation-related measures that are likely to be associated with future economic activities within or

[4] 16 U.S.C. §1533(b)(2).

[5] Executive Order 12866, "Regulatory Planning and Review," September 30, 1993; 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.

[6] In 2001, the U.S. 10th Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes (*New Mexico Cattle Growers Ass'n v. U.S.F.W.S.*, 248 F.3d 1277 (10th Cir. 2001)).

adjacent to the proposed critical habitat boundaries. Actions undertaken to meet the requirements of other Federal, State, and local laws and policies may afford protection to the skipper and its habitat, and thus contribute to the efficacy of critical habitat-related conservation and recovery efforts. Thus, the impacts of these activities are relevant for understanding the full impact of the proposed designation.

7. This analysis considers both economic efficiency and distributional effects. In the case of habitat conservation, efficiency effects generally reflect the opportunity costs associated with the commitment of resources to comply with habitat protection measures (e.g., lost economic opportunities associated with restrictions on land use). This analysis also addresses how potential economic impacts are likely to be distributed (distributional effects), including an assessment of any local or regional impacts of skipper conservation efforts and the potential effects of conservation efforts on small entities and the energy industry. This information can be used by decision-makers to assess whether the effects of the designation might unduly burden a particular group or economic sector. Also, this analysis looks retrospectively at costs that have been incurred since the date the species was listed and considers those costs that may occur after the designation is finalized.

RESULTS OF THE ANALYSIS

8. A variety of activities taking place in or adjacent to essential habitat may be affected by efforts to protect the skipper and its habitat. These activities include:

- Grazing;
- Camping;
- Hiking;
- Utilities;
- Residential development;
- Fire management;
- Water Diversions;
- Surveying and monitoring efforts; and
- Administrative costs associated with section 7 consultations.[7]

9. For comparison purposes, Exhibits ES-7 to ES-9 present costs by affected activity in undiscounted dollars and present value assuming discount rates of seven and three percent, respectively. As shown in these exhibits, as well as in Exhibits ES-4 and ES-5, lost camping opportunities dominate the costs. The following sections provide additional detail on the future impacts forecast by economic activity.

[7] The proposed rule also identifies logging and paved road construction a threat to the species (70 FR 73708). According to the Cleveland National Forest Supervisor, the forest does not allow commercial logging within Forest boundaries and has no current plans for new road construction (Personal communication with Tina Terrell, Forest Supervisor, Cleveland National Forest, March 8, 2007). Additional information and/or comments are invited on these potential threats, and it is anticipated that any new information received will be included in the final version of this report.

EXHIBIT ES-7 TOTAL FUTURE COSTS (2006 - 2025) BY ACTIVITY, UNDISCOUNTED

SUBUNIT	GRAZING		CAMPING	UTILITY		HIKING	SURVEY	STUDY	FIRE	ADMINISTRATIVE
	LOW	HIGH		LOW	HIGH					
1A	$63,000	$108,000	$3,424,000	$17,000	$1,068,000	$52,000	$212,000	$0	$89,000	$959,000
1B	$8,000	$15,000	$0	$0	$0	$0	$29,000	$0	$0	$130,000
1C	$3,000	$10,000	$2,317,000	$0	$0	$29,000	$41,000	$0	$13,000	$147,000
2A	$20,000	$203,000	$0	$8,000	$476,000	$3,000	$82,000	$10,000	$19,000	$81,000
2B	$0	$40,000	$0	$7,000	$457,000	$23,000	$75,000	$0	$38,000	$33,000
2C	$0	$0	$0	$0	$0	$0	$41,000	$0	$32,000	$14,000
2D	$0	$0	$0	$0	$0	$0	$20,000	$0	$0	$5,000
Total:	**$94,000**	**$377,000**	**$5,741,000**	**$32,000**	**$2,000,000**	**$107,000**	**$500,000**	**$10,000**	**$190,000**	**$1,368,000**

Note: Totals may not add due to rounding.

EXHIBIT ES-8 PRESENT VALUE TOTAL FUTURE COSTS (2006 - 2025) BY ACTIVITY, ASSUMING A SEVEN PERCENT DISCOUNT RATE

SUBUNIT	GRAZING		CAMPING	UTILITY		HIKING	SURVEY	STUDY	FIRE	ADMINISTRATIVE
	LOW	HIGH		LOW	HIGH					
1A	$36,000	$61,000	$1,940,000	$10,000	$605,000	$32,000	$120,000	$0	$50,000	$580,000
1B	$4,000	$9,000	$0	$0	$0	$0	$17,000	$0	$0	$78,000
1C	$2,000	$6,000	$1,313,000	$0	$0	$20,000	$23,000	$0	$7,000	$89,000
2A	$11,000	$123,000	$0	$4,000	$270,000	$2,000	$46,000	$9,000	$11,000	$49,000
2B	$0	$23,000	$0	$4,000	$259,000	$13,000	$42,000	$0	$22,000	$20,000
2C	$0	$0	$0	$0	$0	$0	$23,000	$0	$18,000	$8,000
2D	$0	$0	$0	$0	$0	$0	$11,000	$0	$0	$3,000
Total:	**$53,000**	**$222,000**	**$3,254,000**	**$18,000**	**$1,134,000**	**$67,000**	**$283,000**	**$9,000**	**$108,000**	**$828,000**

Note: Totals may not add due to rounding.

EXHIBIT ES-9 PRESENT VALUE TOTAL FUTURE COSTS (2006 - 2025) BY ACTIVITY, ASSUMING A THREE PERCENT DISCOUNT RATE

SUBUNIT	GRAZING		CAMPING	UTILITY		HIKING	SURVEY	STUDY	FIRE	ADMINISTRATIVE
	LOW	HIGH		LOW	HIGH					
1A	$48,000	$83,000	$2,623,000	$13,000	$818,000	$41,000	$163,000	$0	$68,000	$756,000
1B	$6,000	$12,000	$0	$0	$0	$0	$22,000	$0	$0	$102,000
1C	$2,000	$8,000	$1,775,000	$0	$0	$24,000	$31,000	$0	$10,000	$116,000
2A	$15,000	$160,000	$0	$6,000	$364,000	$2,000	$63,000	$10,000	$14,000	$64,000
2B	$0	$31,000	$0	$6,000	$350,000	$18,000	$57,000	$0	$29,000	$26,000
2C	$0	$0	$0	$0	$0	$0	$31,000	$0	$24,000	$11,000
2D	$0	$0	$0	$0	$0	$0	$15,000	$0	$0	$4,000
Total:	**$72,000**	**$293,000**	**$4,398,000**	**$25,000**	**$1,532,000**	**$85,000**	**$383,000**	**$10,000**	**$146,000**	**$1,078,000**

Note: Totals may not add due to rounding.

IMPACTS TO GRAZING

10. To protect the skipper, past conservation activities have resulted in the exclusion of livestock grazing in areas where the skipper's host plant, *Horkelia clevelandii*, is present (i.e., construction of fencing and grazing exclosures). Exclusion of areas from grazing can result in a reduction in the number of permitted animal unit months (AUMs) (animal unit months: forage for one cow and calf for one month) on the allotment. To estimate the impact of these grazing restrictions, this analysis considers two scenarios to estimate future impacts on grazing activities due to the skipper. The first scenario assumes that grazing activities will not be excluded on any private lands in the future while the second scenario assumes that landowners will restrict grazing activities on private lands to avoid incidental take.

11. The potential future loss resulting from a reduction in AUMs grazing on Federal lands is expected to range from 664 to 1,363 AUMs annually over the next 20 years. Note welfare losses estimated on public lands result from conservation measures implemented in the past to protect the skipper and its habitat (for more detail, see Chapter 3). Future reductions in grazing activity on private lands could range from zero to 618 AUMs annually, depending on the extent to which the designation limits grazing on these lands. Total future costs associated with grazing activity are estimated to be $94,000 to $377,000 (undiscounted) over twenty years. Present value future costs are estimated to be $53,000 to $222,000 over this same time period ($5,000 to $21,000 on an annualized basis) using a real rate of seven percent discount rate, or $72,000 to $293,000 ($5,000 to $20,000 on an annualized basis) using a real rate of three percent.

IMPACTS TO CAMPING

12. According to the proposed rule, camping can lead to encroachment of exotic vegetation and can cause direct mortality of skipper larvae by trampling. Protection measures to implemented by the Cleveland National Forest (CNF) to mitigate the impact of camping activities on the skipper populations and habitat, include:

- Capacity reductions at campsites located adjacent to recreation exclosures; and
- Closure of campgrounds with large distributions of the skipper's host plant, *Horkelia clevelandii*.

13. Specifically, since the listing of the species in 1997, CNF reduce capacity at two campsites (Laguna and El Prado campgrounds) and closed one campsite (Agua Dulce campground). Potential costs associated with the impacts of skipper conservation on camping include the lost social welfare to campers resulting from diminished or lost camping opportunities.[8] The welfare that campers derive from camping activity is measured in terms of consumer surplus, which refers to the sum of an individual's maximum willingness to pay for services provided by a given natural resource, net of any costs associated with consuming those services. If a particular campsite becomes

[8] This analysis does not include the revenue losses from overnight camping fees no longer collected by the U.S. Forest Service (USFS) where campsites are closed or capacity is reduced. The revenue loss borne by the USFS is not a welfare loss, because campers retain the fees to spend at other sites or on other activities.

unavailable to a camper, the welfare loss suffered by the camper is his consumer surplus derived from that site, net of the surplus derived from visiting the next best alternative location or undertaking the next most preferred alternative activity.

14. To estimate campers' preferences for different camping experiences within an individual's choice set of camping opportunities, and to understand how campers might substitute between campsites, economists survey campers to obtain information about where and how often they camp and use the resulting data to construct econometric models (e.g., site choice models) of behavior. The existing environmental economics literature was searched for publicly-available economic models estimating campers' responses to the elimination of campsites in similar geographic settings that could be transferred to this analysis. No applicable model was identified. As a result, this analysis uses a simplified approach to bound the potential losses.

15. The lower-bound estimate assumes that adequate, equally desirable substitute camping sites exist to offset recreational camping opportunities lost within proposed critical habitat. Therefore, campers' welfare is unchanged. This assumption is valid if the substitute locations offer exactly the same attributes as the current campgrounds (e.g., the areas are equally easy to access, crowd levels are similar, the aesthetic enjoyment gained from experiencing the natural landscape is the same). This estimate likely understates the impacts, because the availability of perfect substitutes is unlikely.

16. The upper-bound estimate makes the simplifying assumption that all camping trips that normally would have been taken to sites in proposed critical habitat are foregone (i.e., not taken). It accounts for the possibility that campers will experience welfare losses (i.e., losses occurring when trips are diminished, because either campers decide to go to a second-best location in the area that does not have the same attributes as the current campgrounds or because they take fewer camping trips). The analysis transfers welfare values for similar types of camping trips obtained from a technical report prepared for the U.S. Forest Service (USFS) entitled *Updated Outdoor Recreation Use Values on National Forests and Other Public Lands* to value these lost trips.[9] The upper-bound estimate likely overstates impacts, because given the availability of alternate campsite locations, not all trips are likely to be lost.

17. The actual impact likely falls between these two bounds; however information allowing for further refinement of the methodology presented in the chapter is not readily available. Under the assumption that the probability distribution of potential impacts between the two bounds is continuous and not skewed toward either estimate, the average of the two bounds represents a reasonable best estimate of impacts. Therefore, the best estimate of camping impacts is estimated to be $5.7 million (undiscounted) over twenty years. Present value future costs are estimated to be $3.3 million over this same time period ($307,000 on an annualized basis) using a real rate of seven percent, or $4.4 million ($296,000 on an annualized basis) using a real rate of three percent. Welfare losses occur in two subunits: Laguna Meadows (Subunit 1A) and Agua Dulce

[9] Loomis, J., *Updated Outdoor Recreation Use Values on National Forests and Other Public Lands*, prepared for the U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-658, October 2005.

Campground & Horse Meadow (Subunit 1C). Note that welfare losses occurring in these subunits result from capacity reductions and campsite closures implemented in the past by CNF to protect the skipper and its habitat (for more detail, see Chapter 4).

IMPACTS TO HIKING ACTIVITIES

18. According to the proposed rule, protection measures to mitigate the impact of recreational hiking on the skipper and its habitat include installing interpretive signs to educate recreators and constructing recreation exclosures to keep recreators outside of skipper habitat.

19. This analysis calculates a low estimate of hiking-related impacts based on the cost of installing interpretive signs and constructing and maintaining recreation exclosures. For a high estimate, it also includes additional costs for installing two additional recreation exclosures in Subunit 1C and 2B based on spatial data of the distribution of the skipper's host plant, *Horkelia clevelandii*. Because of the availability of many alternate trails, and the fact that all of the current trails will remain open, this analysis does not estimate social welfare losses to hikers.

20. Future impacts to recreational hiking are forecast to be $107,000 (undiscounted) over twenty years. Present value future costs are estimated to be $67,000 over this same time period ($6,000 on an annualized basis) using a real rate of seven percent, or $85,000 ($6,000 on an annualized basis) using a real rate of three percent. The majority (48 percent) of the estimated future impacts is the result of ongoing conservation activities in Subunit 1A.

IMPACTS TO UTILITY ACTIVITIES

21. According to the U.S. Fish and Wildlife Service, potential impacts to utilities include the cost of conducting pre-surveys and maintaining an approved biologist on-site during utility construction and maintenance activities. These future impacts to utilities are forecast to range from $32,000 to $2.0 million (undiscounted) over twenty years. Present value future costs are estimated to be $18,000 to $1.1 million over this same time period ($2,000 to $107,000 on an annualized basis) using a real rate of seven percent, or $25,000 to $1.5 million ($2,000 to $103,000 on an annualized basis) using a real rate of three percent.[10] This range in forecast costs is primarily driven by the fact that the length of the utility project can vary from one day to well over a month.

IMPACTS TO DEVELOPMENT ACTIVITIES

22. Approximately 1,136 acres of private, potentially developable lands occur within proposed critical habitat. This analysis does not anticipate that skipper conservation activities will substantially affect or limit private development in these areas, primarily due to two factors. First, private lands within the proposed critical habitat are located in remote areas that are generally unsuitable for large-scale development. Second, typical

[10] According to the Service, "it is highly unlikely that listing of the skipper or proposed designation of critical habitat would ever require the utilities companies to relocate 'existing' facilities. Critical habitat does not require a return to pre-project conditions. Such relocation has never been required in any previous consultation with the Service, nor is it likely to be required by CNF." FWS comments submitted April 17, 2006.

measures to protect skipper habitat include avoiding patches of the skipper's host plant, *Horkelia clevelandii*, which is likely to be easily incorporated in site development designs given the size of affected parcels and existing density restrictions. Overall, existing conditions discourage the type of development that could threaten the skipper. However, to further describe the economic value of these private lands, Chapter 6 includes a summary of the reported assessed value of these acres.

IMPACTS TO FIRE MANAGEMENT ACTIVITIES

23. Most fire management activities occur outside of the skipper's primary habitat (i.e., open meadows where the skipper's host plant, *Horkelia clevelandii*, is present). However, impacts on fire management activities are likely to be greatest in proposed critical habitat areas that overlap with Wildland and Urban Interface (WUI) areas. WUI are areas "where human life, property, and natural resources are in imminent danger from catastrophic wildfire," where houses meet or intermingle with undeveloped wildland vegetation. This makes the WUI a focal area for human-environment conflicts such as wildland fires. As illustrated in Appendix C, proposed critical habitat overlaps with 1,852 WUI acres, or approximately 28 percent of the total 6,662 acres included in the proposed designation.

24. CNF will be conducting forest health and fuels treatment activities across the forest over the next five to 10 years. As part of these efforts, trees will be removed from partially forested areas within proposed critical habitat. According to CNF staff, additional costs due to the skipper in these areas include additional survey and flagging and additional planning, analysis and treatment costs to ensure that skipper habitat is avoided. Note that the use of these methods will not decrease the effectiveness of fire management activities, and thus increase the risk of a catastrophic fire; it will only make the activities more expensive.

25. The total future impacts associated with fire management activities are estimated to be approximately $190,000 (undiscounted) over twenty years. Present value future costs are estimated to be $108,000 over this same time period ($10,000 on an annualized basis) using a real rate of seven percent, or $146,000 ($10,000 on an annualized basis) using a real rate of three percent.

WATER DIVERSIONS

26. Surface and groundwater management practices are listed among the threats to the essential features that define critical habitat for the skipper. Drying of meadows results in vegetation changes that could eliminate primary constituent elements within skipper habitat (e.g. host plants and surface moisture). The proposed rule recommends monitoring of the potential changes in hydrology caused by stream and groundwater diversions as well as any necessary management to prevent habitat conversion.

27. According to the proposed rule, commercial drinking water projects and private stream alterations are currently diverting stream and groundwater resources to an unknown extent on Palomar Mountain (Unit 2). To understand the impacts of stream and groundwater diversions on local hydrology and the skipper's meadow habitats would require a detailed system-wide model that incorporates withdrawal data for all water

projects in the area with local hydrologic pathways and conditions. Such models do not exist for the Palomar Mountain region. As a result, this analysis is limited to providing a qualitative description of the existing water projects operating on Palomar Mountain in Section 8.2. Additional information and/or comments are invited on these water entities and the potential threats, if any. It is anticipated that any new information received will be included in the final version of this report.

COSTS OF SURVEY AND MONITORING

28. CNF currently conducts annual skipper survey and monitoring at a cost of $25,000 per year. The total future costs of survey and monitoring is approximately $500,000 (undiscounted) over twenty years. Present value future costs are estimated to be $283,000 over this same time period ($27,000 on an annualized basis) using a real rate of seven percent, or $383,000 ($26,000 on an annualized basis) using a real rate of three percent.

ADMINISTRATIVE COSTS OF SECTION 7 CONSULTATIONS

29. This analysis estimates the past and future costs associated with section 7 consultations for the skipper. Since the listing of the species in 1997, there have been three formal consultations, and one informal consultation. Over the next 20 years, CNF staff expect the need to revisit 14 existing consultations in various activities, including grazing, recreation, and fuels management.[11] In addition, CNF anticipate the need to undertake seven new consultations per year for various special use permits, recreation activities and fuels management projects. According to CNF, the extent of the areas proposed for critical habitat are "much greater than then the area previously considered/evaluated as potential skipper habitat." As a result, although CNF has only undertaken a total of four consultations in prior years, the forest expects an increase in the number of consultations due to the larger geographic extent of the proposed designation.[12] The total costs of future section 7 consultations are estimated to be $1.4 million (undiscounted) over twenty years. Present value future costs are estimated to be $828,000 22,000 to $94,000 over this same time period ($78,000 on an annualized basis) using a real rate of seven percent, or $1.1 million ($72,000 on an annualized basis) using a real rate of three percent.

DISTRIBUTIONAL EFFECTS

30. Pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA), the analysis also considers potential future impacts to small entities. Potentially affected small entities include ranchers and recreational campers. Over the next 20 years, two ranchers could be affected by reductions in AUMs: one operating in Subunit 1A and another operating in Subunit 2A.

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[11] For example, page 4-60 of the FWS consultation manual states: "Section 7 regulations outline four general conditions for reinitiating formal consultation … 4) a new species is listed or critical habitat designated that may be affected by the action." Email communication with Kirsten Winter, Forest Biologist, Cleveland National Forest on September 14, 2006.

[12] Email communication with Kirsten Winter, Forest Biologist, Cleveland National Forest on September 14, 2006.

Closure of campgrounds or reduction in campground capacity may result in fewer camping trips to the region. Local establishments providing services to the campers may be indirectly affected, however the impact of these lost expenditures measured using an input-output model is too small to be identified when the results are rounded to significant figures.

AREAS MOST LIKELY TO EXPERIENCE IMPACTS

31. Exhibits ES-10 to ES-12 illustrates those proposed critical habitat subunits that account for the greatest share of forecast costs under the low and high estimates, respectively. As discussed earlier, costs in both estimates are driven by lost camping opportunities (Subunits 1A and 1C). The relative rankings of these subunits, by cost, do not change significantly when present value future costs are considered.

EXHIBIT ES-10 RANKING OF SUBUNITS USING FUTURE UNDISCOUNTED COSTS

SUBUNIT	LOW END	HIGH END
1A	$4,816,000	$5,912,000
1C	$2,549,000	$2,557,000
2A	$223,000	$874,000
2B	$176,000	$665,000
1B	$166,000	$174,000
2C	$87,000	$87,000
2D	$25,000	$25,000
Total:	**$8,041,000**	**$10,292,000**

EXHIBIT ES-11 RANKING OF SUBUNITS BASED ON FUTURE UNDISCOUNTED COSTS: LOW ESTIMATE

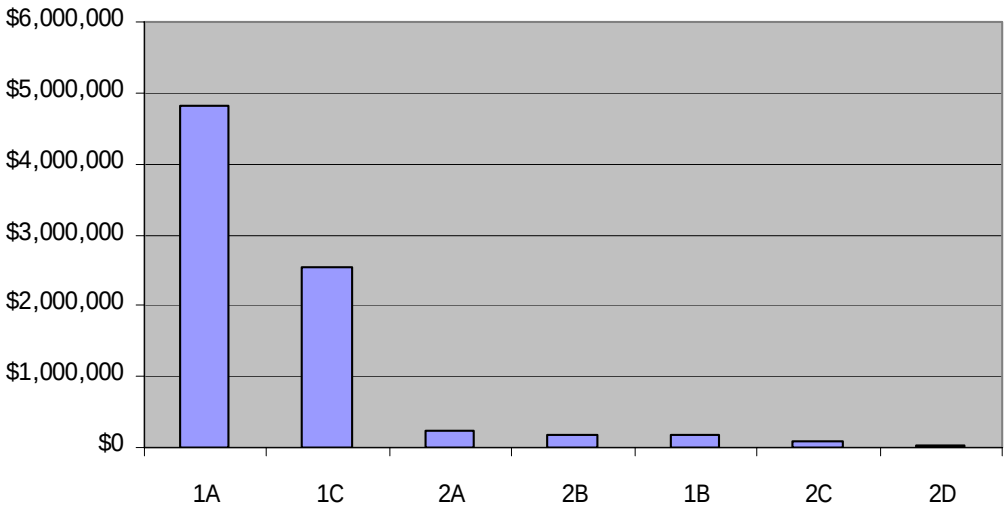
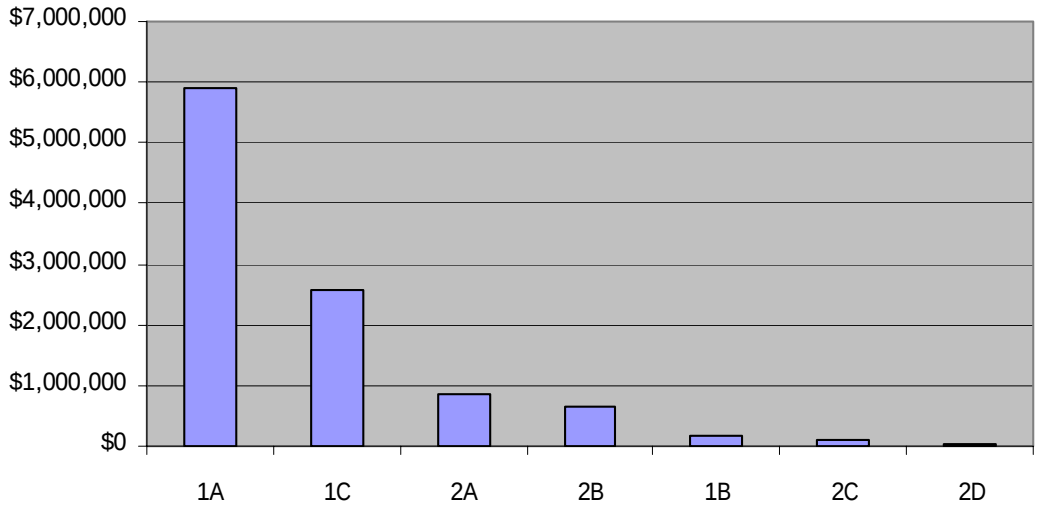


EXHIBIT ES-12 RANKING OF SUBUNITS BASED ON FUTURE UNDISCOUNTED COSTS: HIGH ESTIMATE



CHAPTER 1 | FRAMEWORK FOR ANALYSIS

32. The purpose of this report is to estimate the economic impact of actions taken to protect the federally listed *Pyrgus ruralis lagunae* (laguna mountains skipper, referred to as "the skipper" in this report) and its habitat. It attempts to quantify the economic effects associated with the proposed designation of critical habitat. It does so by taking into account the cost of skipper-related conservation measures that are likely to be associated with future economic activities within the proposed boundaries of critical habitat. The analysis looks retrospectively at costs incurred since the skipper was listed, and forecasts future costs likely to occur after the proposed critical habitat designation (CHD) is finalized.

33. 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[13] In addition, this information allows the U.S. Fish and Wildlife Service (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).[14] This report also complies with direction from the U.S. Court of Appeals for the 10th Circuit that "co-extensive" effects should be included in the economic analysis to inform decision-makers regarding which areas to designate as critical habitat.[15]

34. This section describes the framework of the analysis. First, it describes the general analytic approach to estimating economic effects, including a discussion of both efficiency and distributional effects. Next, this section discusses the scope of the analysis, including the link between existing and critical habitat-related protection efforts and economic impacts. Then, it presents the analytic time frame used in the report. Finally, this section lists the information sources relied upon in the analysis.

[13] 16 U.S.C. §1533(b)(2)

[14] Executive Order 12866, Regulatory Planning and Review, September 30, 1993; 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.

[15] In 2001, the U.S. Court of Appeals for the 10th Circuit instructed the Service to conduct a full analysis of all of the economic impacts of proposed CHD, regardless of whether those impacts are attributable co-extensively to other causes (New Mexico Cattle Growers Ass'n v. U.S.F.W.S., 248 F.3d 1277 (10th Cir. 2001)).

1.1 APPROACH TO ESTIMATING ECONOMIC EFFECTS

35. This economic analysis considers both the economic efficiency and distributional effects that may result from activities to protect the skipper and its habitat (hereinafter referred to collectively as "skipper conservation activities"). Economic efficiency effects generally reflect "opportunity costs" associated with the commitment of resources required to accomplish species and habitat conservation. For example, if activities that can take place on a parcel of land are 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 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 skipper conservation activities.

36. 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 activities on small entities and the energy industry. This information may be used by decision-makers to assess whether the effects of skipper conservation activities unduly burden a particular group or economic sector. For example, while conservation activities 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 difference between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

1.1.1 EFFICIENCY EFFECTS

37. At the guidance of the Office of Management and Budget (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 skipper 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.[16]

38. 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 US Forest Service, 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

[16] 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.

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.

39. 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, a designation that precludes the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market.

40. This analysis begins by measuring costs associated with measures taken to protect the skipper and its habitat. As noted above, in some cases, compliance costs can provide a reasonable estimate of changes in economic efficiency. However, if the cost of conservation activities is expected to significantly impact markets, the analysis will consider potential changes in consumer and/or producer surplus in affected markets.

1.1.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

41. Measurements of changes in economic efficiency focus on the net impact of conservation activities, 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.[17] 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

42. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the Regulatory Flexibility Act, might be affected by future skipper conservation activities.[18] 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 activities on the energy industry and its customers.[19]

[17] 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.

[18] 5 U.S.C. § 601 *et seq*.

[19] Executive Order 13211, *Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,* May 18, 2001.

CALCULATING PRESENT VALUE AND ANNUALIZED IMPACTS

For each land use activity, this analysis compares 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 economic impacts of past or future costs to present value terms requires the following: a) past or projected future costs of skipper conservation activities; 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 skipper conservation efforts from year t to T is measured in 2006 dollars according to the following standard formula:[a]

$$PV_c = \sum_{t}^{T} \frac{C_t}{(1+r)^{t-2005}}$$

C_t = cost of skipper conservation efforts in year t

r = discount rate[b]

Impacts of conservation efforts for each activity in each unit are also expressed as annualized values. Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods (T). For this analysis, however, all activities employ a forecast period of 20 years, 2006 through 2025. Annualized impacts of future skipper conservation activities (APV_c) are calculated by the following standard formula:

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

N = number of years in the forecast period (in this analysis, 20 years)

[a] To derive the present value of past conservation activities for this analysis, t is 1997 and T is 2005; to derive the present value of future conservation efforts, t is 2006 and T is 2025.

[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.)

Regional Economic Effects

43. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation activities. 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., 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.

44. The use of regional input/output models in an analysis of the impacts of species and habitat conservation activities 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.

45. 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.

1.2 SCOPE OF THE ANALYSIS

46. This analysis identifies those economic activities believed to most likely threaten the listed species and its habitat and, where possible, quantifies the economic impact to avoid, mitigate, or compensate for such threats within the boundaries of the CHD. In instances where critical habitat is being proposed after a species is listed, some future impacts may be unavoidable, regardless of the final designation and exclusions under 4(b)(2). However, due to the difficulty in making a credible distinction between listing and critical habitat effects within critical habitat boundaries, this analysis considers all future conservation-related impacts to be co-extensive with the designation.[20,21]

47. Coextensive effects may also include impacts associated with overlapping protective measures of other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation. In past instances, some of these measures have been precipitated by the listing of the species and impending designation of critical habitat. Because habitat conservation efforts affording protection to a listed species likely contribute to the efficacy of the CHD efforts, the impacts of these actions are considered

[20] In 2001, the U.S. Court of Appeals for the 10th Circuit instructed the Service to conduct a full analysis of all of the economic impacts of proposed CHD, regardless of whether those impacts are attributable co-extensively to other causes (New Mexico Cattle Growers Assn v. U.S.F.W.S., 248 F.3d 1277 (10th Cir. 2001)).

[21] In 2004, the U.S. Ninth Circuit invalidated the Service's regulation defining destruction or adverse modification of critical habitat (Gifford Pinchot Task Force v. United States Fish and Wildlife Service). The Service is currently reviewing the decision to determine what effect it (and to a limited extent Center for Biological Diversity v. Bureau of Land Management (Case No. C-03-2509-SI, N.D. Cal.)) may have on the outcome of consultations pursuant to section 7 of the Act.

relevant for understanding the full effect of the proposed CHD. Enforcement actions taken in response to violations of the Act, however, are not included.

1.2.1 SECTIONS OF THE ACT RELEVANT TO THE ANALYSIS

48. This analysis focuses on activities that are influenced by the Service through sections 4, 7, 9, and 10 of the Act. Section 4 of the Act focuses on the listing and recovery of endangered and threatened species, as well as CHD. In this section, the Secretary is required to list species as endangered or threatened "solely on the basis of the best available scientific and commercial data.[22] Section 4 also requires the Secretary to designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat.[23]

49. The protections afforded to threatened and endangered species and their habitat are described in sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections are the focus of this analysis:

- Section 7 of the Act 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 or result in the destruction or adverse modification of critical habitat. The administrative costs of these consultations, along with the costs of project modifications resulting from these consultations, represent compliance costs associated with the listing of the species and CHD.[24]
- 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, or collect, or to attempt to engage in any such conduct.[25] 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 an endangered 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.[26] The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately minimized and mitigated. The designation of critical habitat does not require completion of an

[22] 16 U.S.C. 1533.

[23] 16 U.S.C. 1533.

[24] The Service notes, however, the Ninth Circuit judicial opinion, *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, invalidated the Service's regulation defining destruction or adverse modification of critical habitat. The Service is currently reviewing the decision to determine what effect it (and to a limited extent *Center for Biological Diversity v. Bureau of Land Management* (Case No. C-03-2509-SI, N.D. Cal.)) may have on the outcome of consultations pursuant to section 7 of the Act.

[25] 16 U.S.C. 1532.

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

HCP; however, the designation may influence conservation measures provided under HCPs.

1.2.2 OTHER RELEVANT PROTECTION EFFORTS

50. 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.[27] For the purpose of this analysis, such protective efforts are considered to be co-extensive with the protection offered by critical habitat, and costs associated with these efforts are included in this report. In addition, under certain circumstances, the CHD 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 costs would not have been triggered absent the designation of critical habitat, they are included in this economic analysis.

1.2.3 BENEFITS

51. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.[28] 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.[29]

52. In the context of CHD, 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 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.[30] *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.*

53. 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

[27] For example, the Sikes Act Improvement Act (Sikes Act) of 1997 requires Department of Defense (DoD) military installations to develop Integrated Natural Resources Management Plans (INRMPs) that provide for the conservation, protection, and management of wildlife resources (16 U.S.C. §§ 670a - 670o). These plans must integrate natural resource management with the other activities, such as training exercises, taking place at the facility.

[28] Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993.

[29] 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.

[30] Ibid.

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.

54. 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.

55. This analysis is unable to quantify ancillary benefits associated with skipper conservation activities. Such benefits may include increased water quality resulting from fewer recreators impacting streams (e.g., reduced siltation), improved biological information resulting from surveys of skipper habitat, and reduced threat of catastrophic fire related to increased fire suppression activities. Data required to quantify and monetize these benefits (e.g., incremental changes in water quality resulting from changes in the number of recreators wading in streams) are not readily available.

1.2.4 GEOGRAPHIC SCOPE OF THE ANALYSIS

56. The geographic scope of the analysis includes areas proposed for CHD and areas proposed for exclusion under section 4(b)(2) of the Act. The economic impacts of potential designation are estimated for each of these two categories of land identified in the proposed rule. The analysis focuses on activities within or affecting these areas.

57. Impacts are presented at the finest level of resolution feasible given available data. For the skipper, impacts are reported for each subunit identified in the proposed rule. Chapter 2 presents maps showing the location of the subunits relative to major cities, national forest land, and wilderness lands.

1.3 ANALYTIC TIME FRAME

58. 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. This analysis estimates economic impacts to activities from 1997 (year of the species' final listing) to 2025 (20 years from the year of final designation). Forecasts of economic conditions and other factors beyond the next 20 years would be speculative.

1.4 INFORMATION SOURCES

59. The primary sources of information for this report were communications with and data provided by personnel from the Service, Federal action agencies, affected private parties,

and local and State governments within California. Specifically, the analysis relies on data collected in communication with personnel from the following entities:

- US Forest Service;
- Skipper biologists;
- Palomar State Park;
- Palomar Observatory;
- Utilities, including San Diego Gas &Electric and AT&T;
- San Diego County Assessor's Offices;
- San Diego County Department of Public Health and Environment;
- Local realtors operating in the Palomar Mountain area;
- Local ranchers;
- Palomar Mountain Spring Water Company; and
- County and city planning departments.

60. In addition, this analysis relies upon the Service's section 7 consultation records, public comments, and published journal sources. The reference section at the end of this document provides a full list of information sources.

1.5 STRUCTURE OF THE REPORT

61. The remainder of this report is organized as follows:

- Section 2: Background;
- Section 3: Impacts to Grazing Activities;
- Section 4: Impacts to Camping
- Section 5: Impacts to Hiking Activities;
- Section 6: Impacts to Utility Activities;
- Section 7: Impacts to Rural Development Activities;
- Section 8: Impacts to Other Activities on Federal and State Lands;
- Appendix A: SBREFA Screening Analysis and Impacts to the Energy Industry;
- Appendix B: Summary of Past Impacts to all Activities by Subunit;
- Appendix C: WUI Areas in Proposed Critical Habitat; and
- References.

Sections 3 through 7 are organized by affected activity. For each of these activities, the analysis discusses impacts by proposed critical habitat subunit.

CHAPTER 2 | BACKGROUND

62. This chapter summarizes information about the skipper's regulatory history and habitat taken from the final listing rule and the proposed rule designating critical habitat.

2.1 REGULATORY HISTORY

63. On January 16, 1997, the Service published the final rule listing the skipper as endangered.[31] In the final rule, the Service determined that designation of critical habitat for the skipper was "not prudent." At the time of the listing, the Service determined that publication of maps and descriptions of critical habitat for the skipper could result in "increased collection of specimens by collectors," and "increase demand for these taxa once they are listed as endangered and critical habitat maps could lead unscrupulous collectors to endangered populations. Additional habitat destruction through trampling, discing, grading, and vandalism could result as well." On January 10, 2003, the Center for Biological Diversity filed a lawsuit against the Service challenging the Service's failure to designate critical habitat for the skipper. On July 29, 2003, the Service entered into a stipulated settlement agreement and agreed to reconsider its "not prudent" finding and propose critical habitat, if prudent, on or before November 30, 2005 and to publish a final critical habitat rule, if prudent, on or before November 30, 2006. On December 13, 2005, the Service published the proposed critical habitat designation ("proposed rule") for the skipper in the Federal Register.[32] For a description of the skipper and the primary constituent elements that are essential to the conservation of the species, refer to the proposed rule.

2.2 PROPOSED CRITICAL HABITAT DESIGNATION[33]

64. The Service proposes to designate 6,662 acres of critical habitat in San Diego County. Exhibit 2-1 summarizes landownership by subunit. Exhibit 2-2 provides information on the primary threats to the species within each critical habitat unit and subunit. Exhibit 2-3 shows the location of each subunit of critical habitat.

[31] 62 FR 2313

[32] 70 FR 73699

[33] Information in this section comes from the proposed rule (70 FR 73699).

EXHIBIT 2-1 SUMMARY OF LANDOWNERSHIP BY SUBUNIT (ACRES)

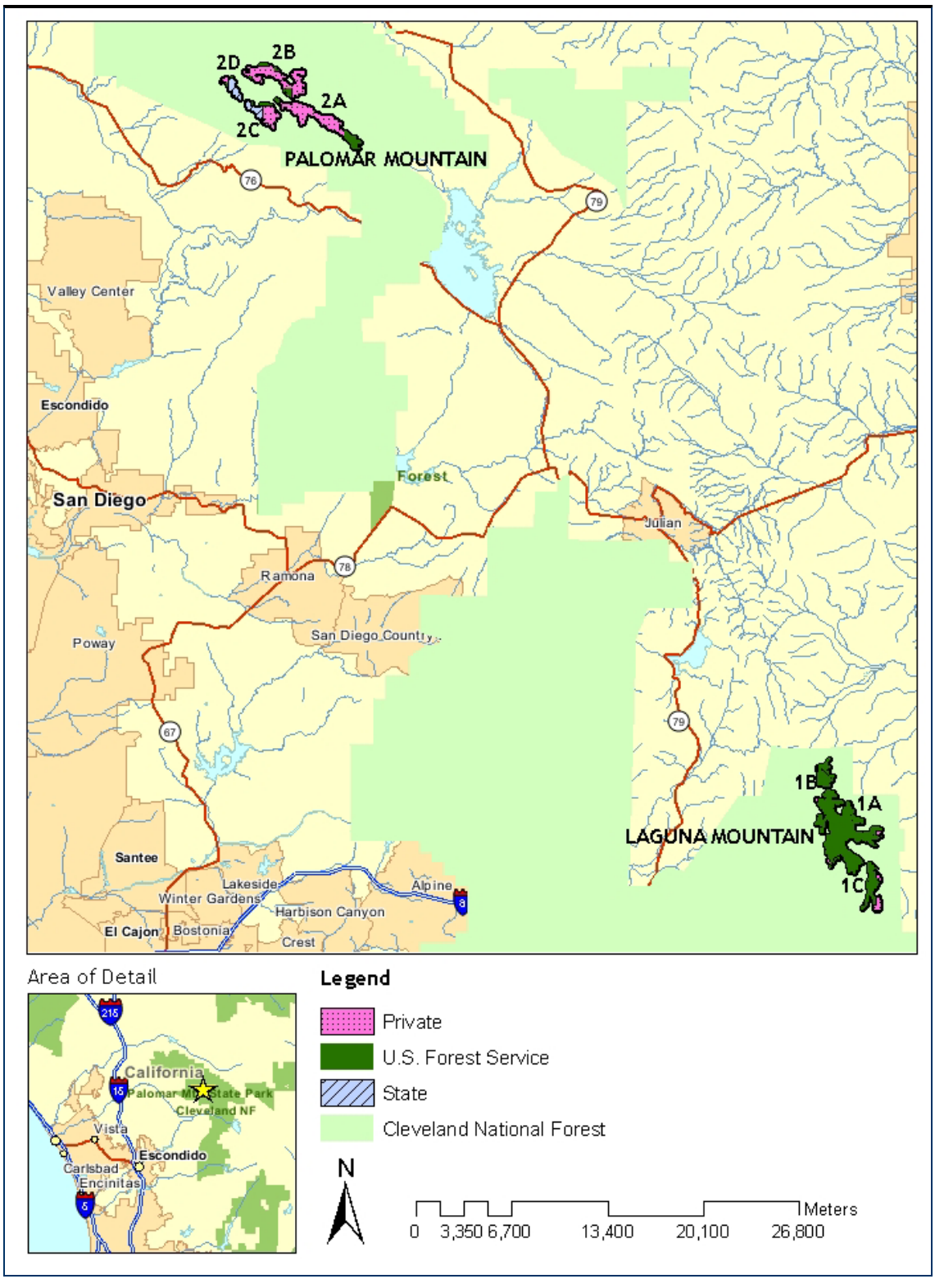
UNIT	SUBUNITS	COUNTY	LANDOWNER(S)/ LAND MANAGER(S)	LANDOWNERS (ACRES)			
				FEDERAL	STATE	PRIVATE	TOTAL
1: Laguna Mountain	A. Laguna Meadow	San Diego	Cleveland National Forest Private	2,724	-	106	2,829
	B. Filaree Flat	San Diego	Cleveland National Forest Private	368	-	20	388
	C. Agua Dulce Campground & Horse Meadow	San Diego	Cleveland National Forest Private	417	-	130	546
2: Palomar Mountain	A. Mendenhall Valley & Observatory Campground	San Diego	Cleveland National Forest Private Palomar Observatory	231	-	861	1,092
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	San Diego	Cleveland National Forest Private Palomar Observatory	93	-	906	998
	C. Upper Doane Valley & Girl Scout Camp	San Diego	Cleveland National Forest Palomar State Park Private Girl Scouts, San Diego-Imperial Council, Inc.	40	191	316	546
	D. Lower French Valley & Lower Doane Valley	San Diego	Cleveland National Forest Palomar State Park Private	14	190	58	262
			TOTAL:	**3,886**	**381**	**2,396**	**6,662**
			Percent of Total:	**58%**	**6%**	**36%**	

EXHIBIT 2-2 PRIMARY THREATS BY BY SUBUNIT

UNIT	SUBUNITS	LANDOWNERS/ LAND MANAGER(S)	PRIMARY THREATS
1: Laguna Mountain	A. Laguna Meadow	Cleveland National Forest Private	Grazing, Hiking, Camping, Utilities, Fire Management
	B. Filaree Flat	Cleveland National Forest Private	Grazing, Hiking
	C. Agua Dulce Campground & Horse Meadow	Cleveland National Forest Private	Grazing, Hiking, Camping, Fire Management
2: Palomar Mountain	A. Mendenhall Valley & Observatory Campground	Cleveland National Forest Private Palomar Observatory	Grazing, Rural Development, Hiking, Camping, Water Diversion, Utilities, Fire Management
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	Cleveland National Forest Private Palomar Observatory	Grazing, Rural Development, Hiking, Fire Management
	C. Upper Doane Valley & Girl Scout Camp	Cleveland National Forest Palomar State Park Private Girl Scouts, San Diego-Imperial Council, Inc.	Grazing, Rural Development, Hiking, Fire Management
	D. Lower French Valley & Lower Doane Valley	Cleveland National Forest Palomar State Park Private	Hiking

Source: Activities threatening or occurring in the habitat, and subunits exposed to these threats are taken from the proposed rule (70 FR 73706 - 73707) and discussions with the Service and stakeholders (e.g., the Forest Service)

EXHIBIT 2-3 PROPOSED CRITICAL HABITAT DESIGNATION FOR THE SKIPPER



65. The primary activities occurring in Unit 1 include grazing on and recreational camping activities on Cleveland National Forest (CNF) lands (Exhibit 2-4). In contrast, Unit 2 consists primarily of private lands, including a Girl Scout Camp and the Palomar Observatory (Exhibit 2-5). In addition, according to the proposed rule, in Unit 2 commercial drinking water projects and private stream alterations currently divert stream and groundwater resources to an unknown extent.

EXHIBIT 2-4 PROPOSED ACTIVITIES OCCURRING IN UNIT 1

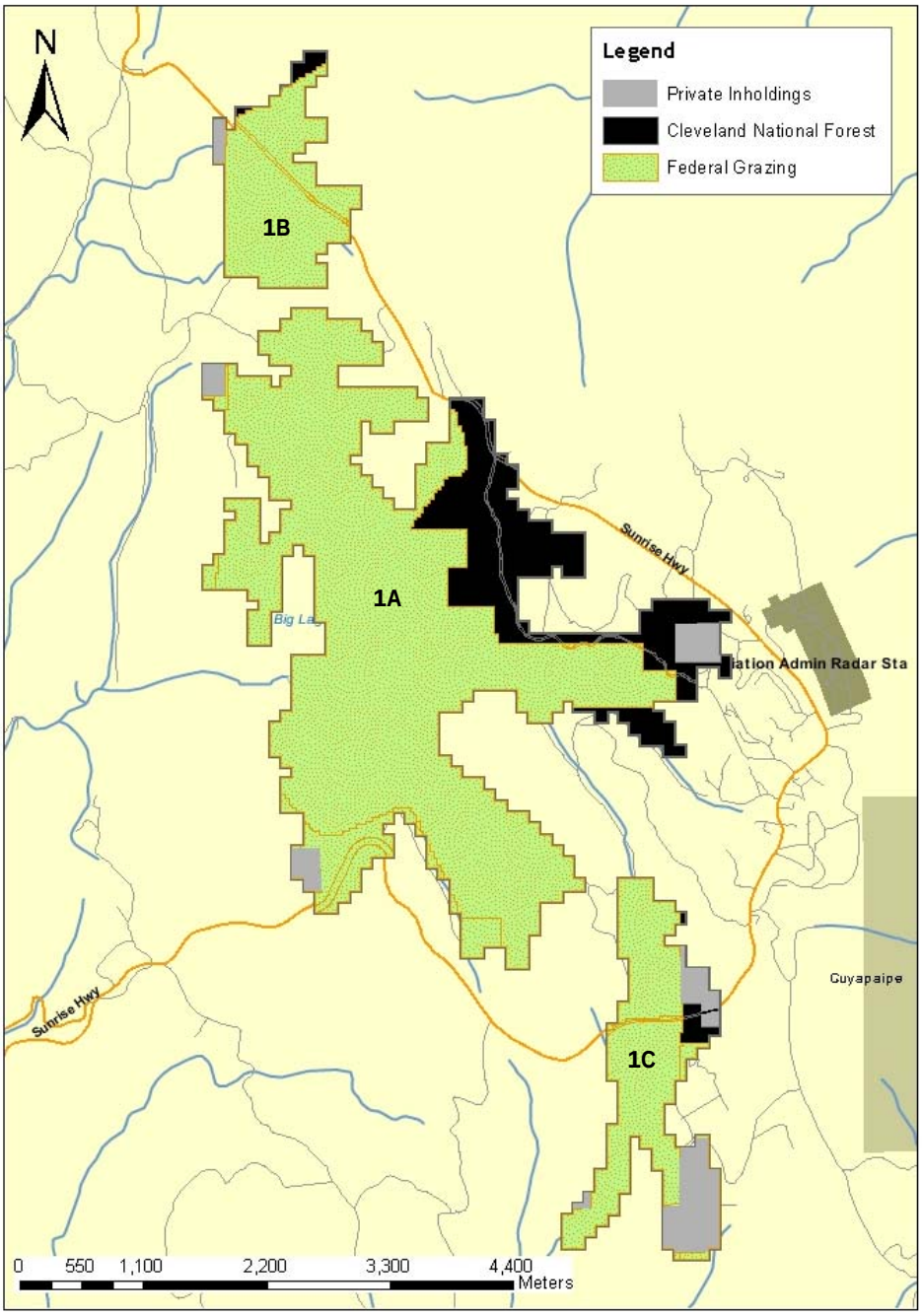
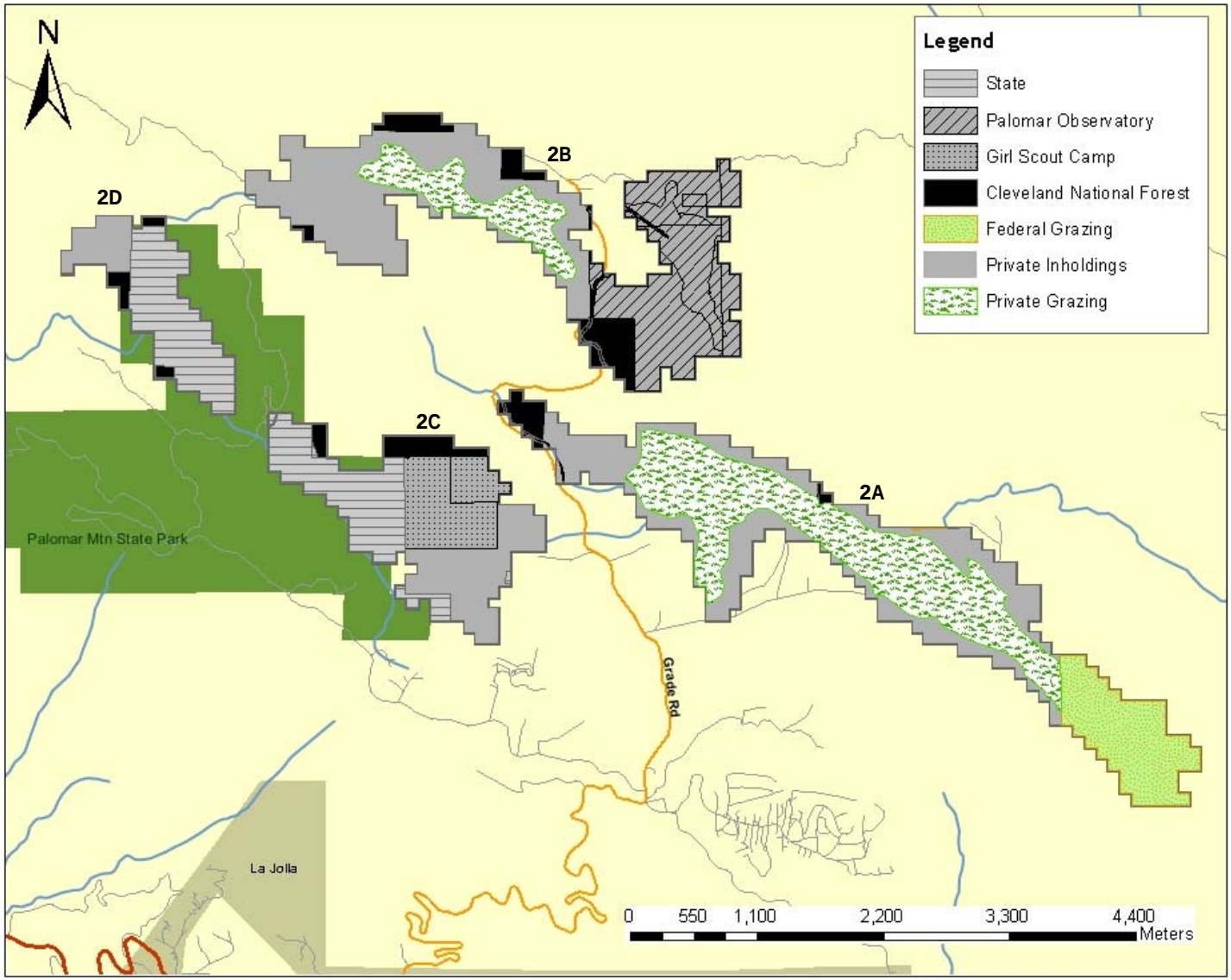


EXHIBIT 2-5 PROPOSED ACTIVITIES OCCURRING IN UNIT 2



CHAPTER 3 | POTENTIAL ECONOMIC IMPACTS TO GRAZING ACTIVITIES

66. This section describes the past and expected future economic impacts to livestock grazing activities in areas proposed as critical habitat for the skipper. Livestock grazing can both directly and indirectly impact the skipper. According to the proposed rule, grazing can cause direct mortality of larvae and eggs by trampling and consumption. In addition, grazing can indirectly impact the skipper by damaging or destroying skipper host plants, thus eliminating critical breeding and nectaring resources for adult skippers.

67. To protect the skipper, past conservation activities have resulted in the exclusion of livestock grazing in areas where the skipper's host plant, *Horkelia clevelandii*, is present (i.e., construction of fencing and grazing exclosures). Exclusion of areas from grazing can result in a reduction in the number of permitted Animal Unit Months (AUMs) (animal unit months: forage for one cow and calf for one month) on the allotment. To estimate the impact of these grazing restrictions, this analysis considers two scenarios to estimate future impacts on grazing activities due to the skipper. The first scenario assumes that grazing activities will not be excluded on any private lands in the future while the second scenario assumes that landowners will restrict grazing activities on private lands to avoid incidental take. The potential future loss resulting from a reduction in AUMs grazing on Federal lands is expected to range from 664 to 1,363 AUMs annually over the next 20 years. Future reductions in grazing activity on private lands could range from zero to 618 AUMs annually, depending on the extent to which the designation limits grazing on these lands. As shown in Exhibit 3-5, forecast future costs associated with grazing activity are estimated to be $53,000 to $222,000 in present value terms, assuming a seven percent discount rate. Note that the welfare losses occurring on public lands result from past conservation measures to restrict grazing to protect the skipper and its habitat.

68. Since the listing of the species, past grazing losses are estimated to have been between 664 and 1,361 AUMs annually. Past costs associated with impacts to grazing activity are estimated at $38,000 to $55,000 in present value terms, assuming a seven percent discount rate (Exhibit 3-6).

69. This section is divided into three parts. The first provides an overview of grazing in areas proposed for critical habitat and a general description of recommended conservation activities. Next is a description of the methods used to forecast the economic impacts of grazing restrictions implemented to protect the skipper and its habitat. The final section provides a summary of the past and expected future impacts to grazing, by subunit.

3.1 BACKGROUND

70. The proposed critical habitat area for the skipper includes areas of Cleveland National Forest (CNF) and private lands that are used for seasonal or year round livestock grazing. Exhibit 3-1 presents the number of acres of CNF and non-federal grazing lands included in this proposed designation by subunit. Four CNF allotments make up the majority of the proposed critical habitat area in Unit 1. One CNF allotment is included in proposed critical habitat areas in subunit 2A. Exhibit 3-2 provides detailed information on the number of acres of CNF grazing lands included in the proposed designation by allotment and subunit.

EXHIBIT 3-1 ACRES OF PUBLIC AND PRIVATE GRAZING LANDS BY SUBUNIT

SUBUNIT	PUBLIC (CNF)[1]	PRIVATE[2]	TOTAL
1A	2,322	0	2,322
1B	375	0	375
1C	496	0	496
2A	203	520	723
2B	0	144	144
2C	0	0	0
2D	0	0	0
Total:	**3,396**	**665**	**4,061**

Sources:
1 CNF GIS grazing allotment data.
2 California Division of Land Resource Protection, Department of Conservation, 2004,"Grazing lands" classification.

EXHIBIT 3-2 ACRES OF CNF GRAZING LANDS BY ALLOTMENT & SUBUNIT

SUBUNIT	ALLOTMENT NAME	ACRES THAT OVERLAP CRITICAL HABITAT AREAS
1A	Indian Creek	20
	Laguna Meadows	2,143
	Pine Creek	7
	Laguna	153
1B	Laguna Meadows	375
1C	Laguna Meadows	250
	Laguna	246
2A	Mendenhall	203
Total:		**3,396**

Note: Totals may not sum due to rounding.
Source: IEc analysis.

71. Livestock grazing can both directly and indirectly impact the skipper. According to the proposed rule, grazing can cause direct mortality of larvae and eggs by trampling and consumption. In addition, grazing can indirectly impact the skipper by damaging or destroying skipper host plants, thus eliminating critical breeding and nectaring resources for adult skippers.

72. The proposed rule recommends "the density of cattle grazed in meadow habitat should be monitored and regulated, as well as levels of habitat degradation resulting from existing grazing. Adaptive management may be needed to adjust cattle grazing intensity, and protection measures may include exclosures to prevent grazing." These actions can be grouped into two categories: grazing restrictions and compliance costs. The following sections provide a discussion of the methodology used to estimate the cost of each of these categories on livestock grazing activities.

3.2 GRAZING RESTRICTIONS ON PUBLIC LANDS

73. Impacts on grazing activity are forecast to occur when restrictions on the use of areas for livestock grazing are implemented for purposes of skipper conservation. Exclusion of areas from grazing can result in a reduction in the number of permitted AUMs on the allotment. Federal livestock grazing permits are generally expressed in terms of total AUMs, where one AUM is equal to the amount of forage required by one animal unit (AU) for one month.

3.2.1 FEDERAL GRAZING PERMITS, AUMS, AND PERMIT VALUE ESTIMATES

74. The system of Federal grazing permits in the American West was established on USFS lands in the early 1990s. In most areas, qualifying ranches (“base properties”) were assigned an exclusive amount of AUMs based on the carrying capacity of the grazing allotment. These allotments were connected to private holdings through the establishment of renewable leases that were both inheritable and transferable with the sale of the land or, in the case of USFS permits, the transfer of the livestock (pending the approval of the USFS). As a result of this attachment of the grazing permit to the base properties, real estate markets adjusted the value of those properties to reflect the Federal AUMs associated with the grazing permits, or permit value.

75. This concept of permit value, however, has been an issue of debate. A 1970 court decision, Pankey Land and Cattle Co. v. Hardin, 427 F.2d 43 (10th Cir. 1970), formed the basis for the government’s position that ranchers “are not given title to the grazing resource and as such do not own a property right or have a corresponding economic right to permit value.” Nonetheless, numerous published studies have found that a rancher obtains a value for holding a Federal grazing permit whether or not he has title to the permit, and whether or not he sells his property. Furthermore, if the grazing fee is below the value of grazing, and if the permit is renewable from year to year in a dependable fashion, then the economic rents (the difference between the fee and the value of grazing) will be incorporated and reflected into the value of the grazing permit.

76. Thus, permit value can be used as a measure of rancher wealth tied up in grazing permits and forced reductions in permitted AUMs can be represented by a loss in permit value, or rancher wealth.

77. Numerous publications support this concept of permit value. For example, Torell et al., states that "permit value represents the only available direct valuation of public land forage, except for a few scattered instances where public land is competitively leased. Using an appropriate capitalization rate, annualized estimates of forage value can be determined from the observed permit value." In a summary of recommended forage valuation methods, the author states that "permit values provide a direct and site-specific estimate of forage value. Theoretically, this estimate should provide a site-specific estimate of value while considering the inherent production characteristics, regulations, and economic potential of specific allotments." As defined in a public comment received on a previous analysis from the New Mexico Department of Agriculture, "permit value is essentially a measure of rancher wealth based on the number of federally permitted AUMs he is allowed to graze, the value of the Federal grazing fee, and the private property rights owned by the permittee." Exhibit 3-3 presents the results of nine recent studies that attempt to measure the permit value, in perpetuity, of Federal grazing (per AUM) on USFS lands.

EXHIBIT 3-3 SUMMARY OF RELEVANT PERMIT VALUE ESTIMATES FOR USFS PERMITS

STUDY	METHOD	YEARS	LOCATION	$/USFS AUM ($2005)*
Torell et al.	Case studies	2002	Idaho, Nevada, Oregon	$99
Torell & Kincaid	Various	1994	New Mexico	$75
Kincaid	Regression	1987-1994	New Mexico	$102
Torell et al.	Regression	1992	New Mexico	$93
Torell & Kincaid	Various	1988	New Mexico	$104
Rowen & Workman	Regression	1980-1988	Utah	$62
Torell & Doll	Regression	1979-1988	New Mexico	$101
Rowen & Workman	Regression	1975-1987	Utah	$34
			In Perpetuity Average:	**$84**
			Annual Average:**	**$4.19**

* Numbers represent the permit value per AUM in perpetuity.

** Assuming a weighted cost of capital of five percent.

Values adjusted using the GDP Deflator, Budget of the United States Government, Fiscal Year 2005, Historical Tables. Sources: Department of Commerce, Bureau of Economic Analysis, 2004; Stern, Bill S. "Permit Value: A Hidden Key to the Public Lands Grazing Dispute," University of Montana, Master of Science thesis, 1998; Torell et al., "Ranch level impacts of changing grazing policies on BLM land to protect the Greater Sage-Grouse: Evidence from Idaho, Nevada, and Oregon." Policy Analysis Center for Western Public Lands, Policy Paper SGB01B02, 2002.

78. The range of values found in these studies likely results from variations in factors, such as study method, region, quality of forage, substitute availability, and capitalization rates. The average permit value across all studies above, in perpetuity, is $84 per USFS AUM, or an annual value of $4.19 using a weighted average cost of capital of five percent.

3.2.2 REDUCTIONS IN AUMS ON FEDERAL LANDS RELATED TO SKIPPER CONSERVATION ACTIVITIES

79. On some allotments that contain skipper habitat, areas have been excluded from grazing either year-round or seasonally to protect the skipper and its habitat, thus reducing the carrying capacity, or permitted AUMs. These reductions in AUMs have impacted the ranchers that graze those lands. However, a complete history of the changes to authorized and permitted head, utilization, and AUMs by allotment over time due to skipper is not available. In addition, two complications arise when estimating the number of AUM reductions associated with restrictions on riparian grazing:

- Numerous factors affect the number of permitted and authorized AUMs approved by USFS for any given grazing allotment, and often AUM reductions due to the skipper cannot be separated from other causes: and
- Restrictions on grazing allotments have been limited to the exclusion of areas that contain the skipper's host plant, *Horkelia clevelandii*. According to conversations with CNF staff, direct AUM reductions have been avoided in the past for this type of restriction through changes in grazing management schemes to avoid excluded areas, or as a result of CNF range management practices that allocate permitted AUMs at levels below the maximum forage capacity of the grazing lands.

80. These two complications are explored further in the following sections.

Factors Affecting Permitted and Authorized AUMs

81. On a particular allotment containing skipper habitat, reductions to authorized or permitted AUMs made by CNF may be: (1) directly related to skipper conservation; (2) not related to skipper conservation at all; or (3) due to a combination of factors. These scenarios are described below:

(1) *Causes directly related to skipper*. Since the listing of the species, grazing exclosures to protect patches of the skipper's host plant have been installed on two CNF grazing allotments. The size of exclosures varies across allotments depending on the presence of the skipper's host plant. For example, on one allotment one grazing exclosure is equal to 700 acres while another grazing exclosure on a different allotment is only five acres.

(2) *Causes unrelated to skipper*. When Federal agencies assess an allotment for permit renewal, they must also consider weather conditions (drought), forage availability, as well as the presence of other sensitive, threatened and endangered species. For example, past reductions in AUMs were prompted in the CNF as a result of the San Diego wildfires in 2003.

(3) *Combination of Causes.* In most cases, however, decisions by Federal agencies to change the permitted or authorized AUMs in various areas is a combination of considerations that include the skipper, other endangered species, other regulatory considerations (such as Grazing Guidance Criteria, Forest Plans, and Resource Management Plans), current forage availability, general health of the grazing lands, and weather conditions. In addition, subjective factors such as political pressures from interest groups or other land user groups may also influence

agency decisions. These subjective impacts are the most difficult to predict, but may play an important role in the decision making process.

82. For allotments that have gone through formal section 7 consultations, or the National Environmental Policy Act (NEPA) permit issuance processes, specific changes directly caused by the skipper can be described and documented. However, not all changes to the permitted AUMs may be directly attributable to skipper conservation activities, and as described above, the spatial and temporal overlap with skipper consultation activities makes separating these impacts difficult.

3.2.3 ESTIMATING SKIPPER-RELATED AUM REDUCTIONS ON PUBLIC GRAZING LANDS

83. Five CNF grazing allotments fall within areas proposed as critical habitat for the skipper. As shown in Exhibit 3-4, in three of the five CNF grazing allotments proposed critical habitat affects less than two percent of the total area available in each allotment. In the Laguna Meadows and Mendenhall allotments, proposed critical habitat consists of approximately 44 and 16 percent, respectively, of the area available in each allotment.

EXHIBIT 3-4 ACRES OF CNF GRAZING LANDS BY ALLOTMENT & SUBUNIT

UNIT1	ALLOTMENT NAME	TOTAL ALLOTMENT AREA (ACRES)	AREA THAT OVERLAPS PROPOSED CRITICAL HABITAT (ACRES)	PERCENT OF ALLOTMENT PROPOSED AS CRITICAL HABITAT
1	Indian Creek	3,265	20	0.61%
	Laguna Meadows	6,356	2,768	44%
	Pine Creek	7,396	7	0.09%
	Laguna	28,157	399	1.42%
2	Mendenhall	1,259	203	16%
	Total:	**46,433**	**3,396**	**7.3%**

Source: IEc analysis.

84. As a result of the complications previously discussed, this analysis uses the following criteria to determine past skipper-related reductions on public grazing lands:

(1) For allotments identified by wildlife biologists, range managers, and permittees as affected by actions directly related to skipper protection, this analysis utilizes the AUM reductions estimated by these entities to quantify the magnitude of the past economic impact; and

(2) For allotments where proposed critical habitat is equal to less than five percent of the total allotment area, this analysis assumes that changes in grazing management practices are available to avoid AUM reductions. As previously discussed, according to conversations with CNF staff, direct AUM reductions have been avoided in the past for this type of restriction through changes in grazing management schemes to avoid excluded areas, or as a result of CNF range management practices that allocate

permitted AUMs at levels below maximum the maximum forage capacity of the grazing lands.

85. To determine future skipper-related reductions on public grazing lands, this analysis uses the following criteria:

(1) For allotments identified by wildlife biologists, range managers, and permittees as affected by past grazing restrictions directly related to skipper protection, this analysis utilizes the AUM reductions estimated by these entities to quantify the magnitude of the future economic impact;

(2) For allotments where proposed critical habitat is equal to less than five percent of the total allotment area, this analysis assumes that changes in grazing management practices are available to avoid AUM reductions; and

(3) For allotments with no past history of grazing restrictions and where proposed critical habitat is equal to more than five percent of total allotment area, this analysis uses spatial data of the skipper's host plant, *Horkelia clevelandii*, to determine the total number of acres potentially subject to future grazing exclosures.

3.2.4 COMPLIANCE COSTS

86. In addition to AUM reductions, additional costs are incurred to construct and maintain grazing exclosures required to protect the skipper's host plant. According to conversations with wildlife biologists, range management specialists, and permittees, construction costs for exclosures are estimated at $20,000 per mile plus approximately $1,000 per year for ongoing maintenance.

3.3 GRAZING RESTRICTIONS ON PRIVATE LANDS

87. This analysis did not identify any past skipper consultations for livestock grazing activities on private lands. However, skipper conservation activities may also impact grazing activities on private lands to the extent that private landowners modify grazing practices in order to avoid incidental take under section 9. Determining the economic impact to grazing activities on private lands requires an estimate of the number of acres of private grazing lands and a measure of the number of cattle that could be supported by these lands (e.g., AUMs), as well as the value per AUM of private grazing lands. This section describes the methodology used to estimate the economic impact of the skipper on grazing activities on private lands.

3.3.1 IDENTIFYING GRAZING ACTIVITIES ON PRIVATE LANDS

88. In California, the Division of Land Resource Protection under the Department of Conservation maintains geographic data of agricultural land uses by county. This data includes grazing lands, defined as land on which the existing vegetation is suited to the grazing of livestock, co-developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities. Based on analysis of this data, private lands suitable for grazing within proposed critical total 520 acres in Subunit 2A and 144 acres in Subunit 2B.

3.3.2 ESTIMATING SKIPPER-RELATED AUM REDUCTIONS ON PRIVATE LANDS

89. This analysis did not identify any past skipper consultations for livestock grazing activities on private lands. Therefore, this analysis only includes an estimate of future AUM reductions due to the presence of the skipper. To forecast the potential number of lost AUMs requires an estimate of the number of acres that would be excluded from private grazing activities to protect the skipper and its habitat, as well as an estimate of the forage productivity of private grazing lands (e.g., number of AUMs per acre).

Acres Excluded from Grazing Due to the Skipper

90. It is unclear to what extent private landowners will modify their grazing practices in light of the designation. As a result, this analysis generates low and high cost estimates to bound the potential economic impact on private grazing activities:

- **Low Estimate**. In the past, grazing restrictions on public lands have been limited to areas on Federal grazing allotments where the skipper's host plant, *Horkelia clevelandii*, is present. Based on this history, the low estimate uses spatial data of the skipper's host plant, *Horkelia clevelandii*, to determine the total number of acres on private land potentially subject to future grazing exclosures.
- **High Estimate**. This analysis also considers a high-end scenario that assumes that 100 percent of the private lands suitable for grazing are excluded from grazing activities. This scenario is included as a high estimate to reflect significant uncertainty regarding the distribution of the skipper's host plant on private lands and the fact that some of the potentially affected ranchers have already been subject to past conservation activities on Federal grazing lands (i.e., ranchers' operations utilize grazing land on both privately-owned land and publicly-leased land).[34]

Forage Productivity of Private Grazing Lands

91. To estimate the forage productivity of private grazing lands, this analysis relies on a 1989 study prepared for the California Department of Forestry and Fire Protection profiling the California Livestock Industry. As part of this study, the productivity of grazing lands for privately owned or leased land was compared to the productivity of land leased from USFS and the U.S. Bureau of Land Management (BLM). On average, depending on vegetation type, this study found that the productivity of private lands range from being equal in productivity to as much as 17 times as productive as USFS public grazing lands. To estimate the number of AUMs reduced on private grazing lands in the proposed CHD, this analysis utilizes the weighted average of these data, or 0.93 AUMs per acre, which suggests that private lands, on average, are four times as productive as public USFS lands.

[34] Data on the spatial distribution of the skipper's host plant, *Horkelia clevelandii*, was obtained from the Service. However, according to the Service, a complete survey for the skipper's host plant has not been completed within proposed critical habitat areas, especially those areas on private lands.

3.3.3 VALUE PER AUM ON PRIVATE LANDS

92. Since 1979, fees for grazing on Federal public lands have been determined by a formula established initially by the Public Rangeland Improvement Act of 1978 and then in 1986, by Executive Order 12548. This formula relies on a number of components, including grazing rates on private lands across 17 states based on a survey of monthly lease rates reported by the U.S. Department of Agriculture's National Agricultural Statistics Services. To estimate the economic losses associated with potential AUM reductions on private lands, this analysis utilizes the private grazing fee rate per AUM for California in 2004, or $14.90 per AUM (2005 dollars).

3.4 FUTURE IMPACTS OF SKIPPER CONSERVATION ON GRAZING ACTIVITIES

93. This section discusses the past and future impacts of skipper conservation activities on CNF lands and private lands by looking at reductions in grazing effort and the compliance costs of constructed grazing exclosures. Regional economic impacts are addressed in Section 3.5. Exhibits 3-5 and 3-6 present the total past and future economic impacts on livestock grazing due to skipper conservation activities. The following sections provide summaries of the current status of grazing activities on public CNF grazing lands as well as past and future skipper conservation activities by allotment.[35] Future impacts to grazing activities on private lands are detailed in Exhibit 3-6.[36]

3.4.1 LAGUNA MEADOW ALLOTMENT

94. Since the listing of the species, the Laguna Meadow allotment has been subjected to the greatest set of restrictions to protect the skipper and its habitat. The Laguna Meadow allotment is approximately 6,356 acres, of which approximately 44 percent (or approximately 2,800 acres) is proposed as critical habitat for the skipper across multiple subunits in Unit 1 (see Exhibit 3-2). The allotment is subdivided into four pastures: Wooded Hill, Morris, Laguna Meadow and Filaree Flat. In 1999, grazing was excluded from approximately 700 acres on the Laguna Meadow pasture, and in 2001 the Wooded Hill pasture (approximately 800 acres) was closed until construction of grazing exclosures to protect the skipper's host plant were completed. At the time of this report, a grazing exclosure has still not been constructed.

95. According to discussions with the permittee, grazing restrictions on the allotment since the early 1990s have resulted in a significant reduction in the total number of cattle that the permittee can operate on the allotment from approximately 300 cattle (approximately equivalent to 2,025 AUMs) to 100 cattle (approximately equivalent to 664 AUMs).[37,38] However, as previously described, not all changes to the permitted AUMs may be directly attributable to skipper conservation activities. According to discussions with

[35] Information on grazing allotment status and permitted AUMs obtained from personal communication with Lance Criley, Range Specialist, USFS, Cleveland National Forest, Descanso Ranger District, February 23, 2006.

[36] As previously mentioned, this analysis did not identify any past skipper consultations for livestock grazing on private lands.

[37] Personal communication with Jim Kemp, Laguna Meadow grazing permittee, February 10, 2006.

[38] Permitted AUMs are calculated by multiplying the number of cattle, the number of active grazing months, and a forage factor of 1.35, which is equal to the forage requirements of one mature cow and calf.

CNF range specialists, in recent years, permitted AUMs have fluctuated due to a number of factors in addition to the skipper, including the 2003 wildfires, drought, and general resource conditions.[39] However, the spatial and temporal overlap with skipper consultation activities makes separating these impacts difficult. As a result, this analysis estimates past and future reduction in AUMs from 664 AUMs (or 100 cattle) on the low end to 1,361 AUMs (or 200 cattle) on the high end. This analysis assumes that there will be no additional reductions in AUMs due to the skipper.[40]

3.4.2 MENDENHALL ALLOTMENT

96. The Mendenhall allotment is approximately 1,259 acres, of which approximately sixteen percent (or approximately 200 acres) is proposed as critical habitat for the skipper in Unit 2A. The allotment is subdivided into two pastures: North and South. In 1997, a small grazing exclosure (approximately 0.05 acres) was constructed on the South pasture and in 2000, a five acre grazing exclosure was constructed on the North pasture.

97. According to discussions with the permittee, the two grazing exclosures have not resulted in any significant reduction in the total number of cattle that the permittee can operate on the allotment.[41] As a result, this analysis estimates no past impacts to this allotment due to the skipper.

98. For future impacts, this analysis estimates no impacts on the low end, assuming status quo of the current restrictions. Since proposed critical habitat covers greater than five percent of the total allotment area, on the high end, this analysis examines spatial data on the distribution of the skipper's host plant to further refine the estimate of acres that may be subject to future restrictions due to the skipper. According to this spatial data, the skipper's host plant, *Horkelia clevelandii*, is present on approximately 13 acres of the Mendenhall allotment, or one percent of the total allotment area. As a result, this analysis does not estimate any future impacts due to the skipper on this allotment.

3.4.3 LAGUNA ALLOTMENT

99. The Laguna allotment is approximately 28,000 acres, of which approximately 1.5 percent (or approximately 400 acres) is proposed as critical habitat for the skipper in Subunits 1A and 1C. The allotment includes only one pasture, the Joy pasture, and is permitted for 10 cattle for five months from May 1 to September 30. There have been no past conservation activities for the skipper on this allotment. Because proposed critical habitat makes up less than five percent of the total allotment area, no future impacts are assumed for this allotment.[42]

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[39] Personal communication with Lance Criley, Range Specialist, USFS, Cleveland National Forest, Descanso Ranger District, February 23, 2006.

[40] According to discussions with USFS, no additional grazing exclosures are planned for this allotment. This allotment has been surveyed extensively for *Horkelia clevelandii* - in particular those areas that receive the greatest degree of grazing activity. As a result, all known areas with the skipper's host plant have been excluded from grazing and this analysis assumes that no additional areas will be excluded in the future. (Email communication with Lance Criley, Range Specialist, USFS, Cleveland National Forest, Descanso Ranger District, March 16, 2006).

[41] Personal communication with Dave Mendenhall, Mendenhall grazing permittee, February 17, 2006.

[42] Additional information and/or comments are invited on this allotment if available. It is anticipated that any new information received will be included in the final version of this report.

3.4.4 INDIAN CREEK ALLOTMENT

100. The Indian Creek allotment is approximately 3,265 acres, of which less than one percent (or approximately 20 acres) is proposed as critical habitat for the skipper in Subunit 1A. The allotment is permitted for 100 cattle for five months. The current permittee has not used this allotment since 2000. However, at the time of this report, CNF staff indicated that the allotment will likely be transferred for use by the current permittee of the Laguna Meadow allotment.

101. There have been no past conservation activities for the skipper on this allotment. Since proposed critical habitat makes up less than five percent of the total allotment area, no future impacts are assumed for this allotment. [43]

3.4.5 PINE CREEK ALLOTMENT

102. The Pine Creek allotment is approximately 7,400 acres, of which less than one-tenth of one percent (or approximately seven acres) is proposed as critical habitat for the skipper in Subunit 1A. The allotment is subdivided into three pastures and is permitted for 45 cattle for three months. The current permittee has not used this allotment since 2002 and as a result, the allotment has been in a rest status since 2002. At the time of this report, CNF staff indicated that the future grazing use of this allotment is uncertain in part due to the allotment's proximity to the Pine Valley community.

103. There have been no past conservation activities for the skipper on this allotment. Since proposed critical habitat makes up less than five percent of the total allotment area, no future impacts are assumed for this allotment.[44]

3.4.6 SUMMARY OF PAST IMPACTS ON GRAZING ACTIVITIES

104. This analysis estimates that a total of 664 to 1,361 AUMs per year have been lost as a result of past skipper conservation actions, resulting in total past permit value losses to ranchers of between $14,000 to $27,000 (undiscounted dollars) since 1997. As shown in Exhibit 3-5, total costs related to past impacts on grazing activities on CNF public lands, including permit value losses and the costs of grazing exclosure construction and maintenance, are estimated at $29,000 to $42,000 (undiscounted dollars). Applying a discount rate of three percent yields a total present value of $33,000 to $47,000 and a discount rate of seven percent yields a total present value of $38,000 to $55,000.

3.4.7 SUMMARY OF FUTURE IMPACTS ON GRAZING ACTIVITIES

105. This analysis forecasts total future grazing reductions of 664 to 1,979 AUMs annually as a result of skipper conservation activities, resulting in future permit value losses to ranchers between $54,000 and $298,000 (undiscounted dollars). As shown in Exhibit 3-6, total costs related to past impacts on grazing activities on CNF and private lands, including permit value losses and the costs of grazing exclosure construction and maintenance, are estimated at $94,000 to $377,000 (undiscounted dollars).

[43] Ibid.

[44] Ibid.

3.5 REGIONAL ECONOMIC IMPACTS

106. This section presents the regional economic impacts expected to result from reductions in grazed AUMs generated by skipper conservation activities. The above analysis estimates:

- Approximately 664 to 1,361 AUMs reduced each year on public (CNF) grazing lands due to skipper conservation activities since 1997.
- Approximately 664 to 1,979 AUMs reduced each year on public and private grazing lands over the next 20 years due to skipper conservation activities.

107. Decreases in livestock production due to reductions in AUMs in proposed critical habitat areas will occur only if no substitute forage is available. In general, it has been documented that ranchers work to maintain the size of existing herds following changes in public land forage availability. For example, Rimbey et al. states that when faced with changes to public forage availability, ranchers "would do everything they could do to maintain their existing herd. Depending upon when the reductions occurred during the year, the ranchers identified alternatives for maintaining herd size and remaining in business: purchase (or not sell) additional hay (to replace forage in winter, early spring, or late fall), and look for private pasture and rangeland leases (summer forage). The last alternative mentioned by ranchers was the reduction in the number of cattle they would run on their ranches."[45] Torell et al. state that "given the stated and observed desire to remain in ranching, perhaps, the most reasonable assumption for policy analysis is that western ranchers will continue in business until forced to leave."[46] In another example, Rowe et al. states that "in general, ranchers favor finding alternatives to Federal forage rather than selling their ranch if faced with reductions in Federal forage."[47] Given observed rancher behavior, it is unclear that a reduction in permitted or authorized AUMs in proposed skipper critical habitat areas would necessarily lead to a reduction in herd size, as long as replacement forage is available.

[45] Rimbey, N., T. Darden, A. Torrell, J. Tanaka, L. Van Tassel, and J.D. Wulfhorst. "Ranch Level Economic Impacts of Public Land Grazing Policy Alternatives in the Bureau Resource Area of Owyhee County, Idaho." Agricultural Economics Extension Series No. 03-05, University of Idaho, College of Agricultural and Life Sciences, June 2003.

[46] Torell, L. Allen et al., "The Lack of Profit Motive for Ranching: Implications for Policy Analysis," *Current Issues in Rangeland Economics, Proceedings of a Symposium Sponsored by Western Coordinating Committee* 55 (WCC-55), February 2001.

[47] Rowe, Helen I., M. Shinderman, and E.T. Bartlett, "Change on the range." Rangelands 23 (2), April 2001.

EXHIBIT 3-5 SUMMARY OF PAST IMPACTS TO GRAZING ACTIVITIES, 1997-2005 ($2006)[1,2,3]

SUBUNIT	AFFECTED PARTY	CHD ACRES[4]	ESTIMATED AUM REDUCTION		TOTAL PAST IMPACTS (UNDISCOUNTED DOLLARS)		TOTAL PAST IMPACTS (PRESENT VALUE, 3%)		TOTAL PAST IMPACTS (PRESENT VALUE, 3%)	
			LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
1A	CNF	2,322	514	1,054	$11,000	$22,000	$12,000	$24,000	$13,000	$27,000
1B	CNF	375	90	184	$2,000	$4,000	$2,000	$4,000	$2,000	$5,000
1C	CNF	496	60	123	$1,000	$1,000	$1,000	$1,000	$2,000	$2,000
2A	CNF	202.85	0	0	$15,000	$15,000	$17,000	$17,000	$21,000	$21,000
TOTAL:		**4,061**	**664**	**1,361**	**$29,000**	**$42,000**	**$33,000**	**$47,000**	**$38,000**	**$55,000**

Notes:
[1] This analysis did not identify any past skipper consultations for livestock grazing activities on private lands.
[2] Estimated permit values calculated assuming a permit value of $84 per USFS AUM.
[3] Numbers may not add due to rounding.
[4] Equals the number of acres designated as proposed skipper critical habitat within the grazing allotment.

EXHIBIT 3-6 SUMMARY OF FUTURE IMPACTS TO GRAZING ACTIVITIES, 2006-2025 ($2006)[1,2]

SUBUNIT	AFFECTED PARTY	CHD ACRES[3]	ESTIMATED AUM REDUCTION		TOTAL FUTURE IMPACTS (UNDISCOUNTED DOLLARS)		TOTAL FUTURE IMPACTS (PRESENT VALUE, 3%)		TOTAL FUTURE IMPACTS (PRESENT VALUE, 3%)	
			LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
1A	CNF	2,322	514	1,054	$63,000	$108,000	$48,000	$83,000	$36,000	$61,000
1B	CNF	375	90	184	$8,000	$15,000	$6,000	$12,000	$4,000	$9,000
1C	CNF	496	60	123	$3,000	$10,000	$2,000	$8,000	$2,000	$6,000
2A	CNF	202.85	0	0	$20,000	$59,000	$15,000	$49,000	$11,000	$41,000
	Private	520	0	484	$0	$144,000	$0	$111,000	$0	$82,000
2B	Private	144	0	134	$0	$40,000	$0	$31,000	$0	$23,000
TOTAL:		**4,061**	**664**	**1,979**	**$94,000**	**$377,000**	**$72,000**	**$293,000**	**$53,000**	**$222,000**

Notes:
[1] Estimated permit values calculated assuming a permit value of $84 per USFS AUM and $213 per private AUM.
[2] Numbers may not add due to rounding.
[3] Equals the number of acres designated as proposed skipper critical habitat within the grazing allotment or within private lands suitable for grazing activities.

108. However, given the localized nature of ranching and the increasing number of restrictions on ranching behavior overall, it is possible that reductions in forage availability on public land associated with skipper conservation could occur in areas where substitute forage is not available, or where supplemental forage is prohibitively expensive. This analysis assumes that AUMs will be lost as a result of skipper conservation (i.e., effectively assuming that no replacement forage is available), which captures the value of these losses to rancher wealth by assuming that ranchers lose the value of these AUMs.

109. To estimate the regional economic impact of grazing restrictions, this analysis first estimates the number of AUMs likely to be lost annually as a result of skipper conservation activities. Direct effects are calculated by converting this AUM reduction to an estimated loss in livestock production. Next, the analysis utilizes IMPLAN to estimate indirect and induced impacts on the region in terms of output and jobs.

Running the IMPLAN Model

110. For purposes of this regional economic impact analysis, the study area is San Diego County. Restrictions in grazing activity will primarily affect the livestock-related sectors of the economy. Decreased operations in these industries would also result in secondary effects on related sectors in the study area. Some of these related sectors may be closely associated with the livestock, such as feed grains and hay and pasture; while others may be less closely associated with the industry, such as the insurance sector.

111. This analysis relies on regional economic modeling to estimate the economic impacts of these initial and secondary effects. In particular, it utilizes a software package called IMPLAN to estimate the total economic effects of the reduction in economic activity in the livestock-related industries in the study area. IMPLAN is commonly used by State and Federal agencies for policy planning and evaluation purposes. The model draws upon data from several Federal and State agencies, including the Bureau of Economic Analysis and the Bureau of Labor Statistics.

112. IMPLAN translates initial changes in expenditures into changes from demand for inputs to affected industries. These effects can be described as direct, indirect, or induced, depending on the nature of the change:

- *Direct effects* represent changes in output attributable to a change in demand or a supply shock. These are specified initially by the modeler (e.g., the change in ranching expenditures on goods and services, by sector);
- *Indirect effects* are changes in output industries that supply goods and services to those that directly affected by the initial change in expenditures; and
- *Induced effects* reflect changes in household consumption, arising from changes in employment (which in turn are the result of direct and indirect effects). For example, changes in employment in a region may affect the consumption of certain goods and services.

113. These categories are calculated for all industries to determine the regional economic impact of grazing restrictions resulting from skipper conservation activities.

Caveats to the IMPLAN Model

114. There are two important caveats relevant to the interpretation of IMPLAN model estimates, generally, and within the context of this analysis. The first is that the model is static in nature and measures only those effects resulting from a specific policy change (or the functional equivalent specified by the modeler) at a single point in time. Thus, IMPLAN does not account for posterior adjustments that may occur, such as the subsequent re-employment of workers displaced by the original policy change. In the present analysis, this caveat suggests that the long-run net output and employment effects resulting from grazing restrictions are likely to be smaller than those estimated in the model, which implies an upward bias in the estimates. A second caveat to the IMPLAN analysis is related to the model data. The IMPLAN analysis relies upon input/output relationships derived from 2002 data. Thus, this analysis assumes that this historical characterization of the affected counties' economies are a reasonable approximation of current conditions. If significant changes have occurred since 2002 in the structure of the economies of the counties in the study area, the results may be sensitive to this assumption. The magnitude and direction of any such bias are unknown.

3.5.1 PAST REGIONAL ECONOMIC IMPACT ESTIMATES

115. Past direct effect of reduced AUMs on annual livestock production are estimated using the high estimate of lost AUMs (Exhibit 3-5). At the high end, this analysis estimates that 1,200 AUMs have been lost each year due to skipper conservation activities since 1995. The calculation of the direct effect of reduced AUMs on annual livestock production rely on the following assumptions:

- The 2004 livestock production per head in California ($930); and[48]
- Value per head is converted to annual forage value (per AUM) by dividing by 18 ($52).[49]

116. Exhibit 3-7 presents the results of the IMPLAN analysis. The reduction in livestock production as a result of AUM reductions is shown to have resulted in economic loss of approximately $110,000 (2006 dollars) in regional output and approximately 1.4 jobs across all sectors of the economy. This impact represents approximately less than one percent of total output from the livestock industry in this region.

[48] 2004 value of all cattle and calves per head (dollar) in California. (NASS. 2004. Agricultural Statistics 2004. United States Department of Agriculture. Washington, DC. 2004)

[49] Assuming one calf per cow and a monthly requirement of 0.5 AUMs per calf. Lewandrowski, Jan and K. Ingram, Restricting Grazing on Federal Lands in the West to Protect Threatened and Endangered Species: Ranch and Livestock Sector Impacts. Review of Agricultural Economics, Volume 24, Number 1 (78-107).

EXHIBIT 3-7 PAST REGIONAL ECONOMIC IMPACT OF ANNUAL REDUCTION IN LIVESTOCK PRODUCTION, 1997-2005*

SUBUNIT	AFFECTED PARTY	DIRECT EFFECT (OUTPUT)	INDIRECT EFFECT (OUTPUT)	INDUCED EFFECT (OUTPUT)	TOTAL IMPACT (OUTPUT)
1A	CNF	$58,000	$20,000	$7,000	$85,000
1B	CNF	$10,000	$4,000	$1,000	$15,000
1C	CNF	$7,000	$2,000	$1,000	$10,000
2A	CNF	$0	$0	$0	$0
2A	Private	$0	$0	$0	$0
2B	Private	$0	$0	$0	$0
	Total Output:	**$75,000**	**$26,000**	**$9,000**	**$110,000**
	Total Employment:	1.1	0.2	0.1	1.4

* Regional economic impact measures represent one-time changes in economic activity (i.e., not present values).

3.5.2 FUTURE REGIONAL ECONOMIC IMPACT ESTIMATES

117. Future regional economic impacts are estimated using the high estimate of lost AUMs (Exhibit 3-6). At the high end, this analysis forecasts that 1,979 AUMs will be lost each year due to skipper conservation activities. The calculation of the direct effect of future reductions in AUMs on annual livestock production relies on the same assumptions as the analysis of past impacts:

- The five-year average of livestock production per head in California ($930); and[50]
- Value per head is converted to annual forage value (per AUM) by dividing by 18 ($52).[51]

118. Exhibit 3-8 presents the results of the IMPLAN analysis. The future reduction in livestock production as a result of AUM reductions is shown to result in economic loss of approximately $161,000 (2006 dollars) in regional output and approximately 2.1 jobs across all sectors of the economy. This impact represents less than one percent of total output from the livestock industry in this region.[52]

[50] Value of all cattle and calves per head (dollar), 1992-2003. NASS, 2002.

[51] Assuming one calf per cow and a monthly requirement of 0.5 AUMs per calf. Lewandrowski, Jan and K. Ingram, Restricting Grazing on Federal Lands in the West to Protect Threatened and Endangered Species: Ranch and Livestock Sector Impacts. Review of Agricultural Economics, Volume 24, Number 1 (78-107).

[52] This data is from IMPLAN for the Range-Fed, Ranch-Fed and Cattle Feedlots livestock sectors.

EXHIBIT 3-8 FUTURE REGIONAL ECONOMIC IMPACT OF ANNUAL REDUCTION IN LIVESTOCK PRODUCTION, 2006-2025*

SUBUNIT	AFFECTED PARTY	DIRECT EFFECT (OUTPUT)	INDIRECT EFFECT (OUTPUT)	INDUCED EFFECT (OUTPUT)	TOTAL IMPACT (OUTPUT)
1A	CNF	$58,000	$20,000	$7,000	$85,000
1B	CNF	$10,000	$4,000	$1,000	$15,000
1C	CNF	$7,000	$2,000	$1,000	$10,000
2A	CNF	$0	$0	$0	$0
2A	Private	$27,000	$9,000	$3,000	$39,000
2B	Private	$7,000	$3,000	$1,000	$11,000
	Total Output:	**$109,000**	**$38,000**	**$13,000**	**$161,000**
Total Employment:		1.6	0.3	0.1	2.1

* Regional economic impact measures represent one-time changes in economic activity (i.e., not present values).

3.6 CAVEATS

119. Exhibit 3-9 summarizes the key assumptions used in the analysis of economic impacts on grazing activities, as well as the potential direction and relative scale of the bias introduced by these assumptions.

EXHIBIT 3-9 CAVEATS TO THE ECONOMIC ANLAYSIS OF IMPACTS TO GRAZING

KEY ASSUMPTION	EFFECT ON IMPACT ESTIMATE
Although there are many factors that may result in AUM reductions (e.g., 2003 wildfires, drought, and general resource conditions) historical reductions to grazing (permitted AUMs) in skipper habitat are assumed to result from skipper conservation activities.	+
This analysis assumes that all private lands supporting rangeland vegetation are used for livestock grazing.	+
While there is no history of grazing restrictions on private lands for skipper, this analysis includes a scenario that assumes restrictions are likely in the future to reflect the possibility that private landowners may modify their grazing practices to avoid incidental take under section 9. This scenario is included as a high estimate to reflect in part the fact that some of the potentially affected ranchers have already been subject to past conservation activities on Federal grazing lands (i.e., ranchers' operations utilize grazing land on both privately-owned land and publicly-leased land).	+
For the high-end estimate impacts on private lands, this analysis assumes that affected allotments will be retired completely. In fact, the consultation history suggests that grazing may only be disallowed in areas where the skipper's host plant is present (i.e., Scenario 1). This scenario is included as a high estimate to reflect in part the significant uncertainty regarding the distribution of the skipper's host plant on private lands. As previously noted, data on the spatial distribution of the skipper's host plant, *Horkelia clevelandii*, is the best data currently available, obtained from the Service. However, according to the Service, a complete survey for the skipper's host plant has not been completed within proposed critical habitat areas, especially those areas on private lands.	+
The livestock grazing permit value is $84/AUM on USFS lands, and $213/AUM on private lands.	+/-
To estimate the number of AUMs reduced on non-federal grazing lands in the proposed CHD, this analysis utilizes 0.93 AUMs per acre, which suggests that private lands, on average, are four times as productive as Federal lands.	+/-

KEY ASSUMPTION	EFFECT ON IMPACT ESTIMATE
The IMPLAN model used to estimate regional economic impacts is a static model and does not account for the fact that the economy will adjust. IMPLAN measures the effects of a specific policy change at one point in time. Over the long-run, the economic losses predicted by the model may be overstated as adjustments such as re-employment of displaced employees occurs.	+
The IMPLAN model used to estimate regional economic impacts relies on 2002 data. If significant changes have occurred in the structure of the affected counties economies, the results may be sensitive to this assumption. The direction of any bias is unknown.	+/-
The annual production value of livestock used in the IMPLAN regional economic model is $52/AUM.	+/-
- : This assumption may result in an underestimate of real costs. + : This assumption may result in an overestimate of real costs. +/-: This assumption has an unknown effect on estimates.	

CHAPTER 4 | POTENTIAL ECONOMIC IMPACTS TO CAMPING ACTIVITIES

120. This section considers how skipper conservation may impact recreational camping activities in areas that contain proposed critical habitat. According to the proposed rule, camping can lead to encroachment of exotic vegetation and can cause direct mortality of skipper larvae by trampling. Past conservation measures on camping activities have included capacity reductions at campsites adjacent to skipper habitat, installation of interpretive signs, and the construction of recreation exclosures. This section considers the economic impact of campsite reductions. Chapter 5 addresses costs associated with the installation of interpretive signs and construction of recreation exclosures that impact hiking activities in proposed critical habitat areas.

121. The welfare that campers' derive from camping is measured in terms of consumer surplus, which refers to the sum of an individual's maximum willingness to pay for services provided by a given natural resource, net of any costs associated with consuming those services. If a particular campsite becomes unavailable, the welfare loss suffered by the camper is his consumer surplus derived from the camping location, net of the surplus derived from visiting the next best alternative location or undertaking the next most preferred alternative activity.

122. Information regarding the relative value of substitute camping sites in this area and decisions about whether trips will be taken after camping sites are removed from proposed critical habitat are not readily available. Therefore, this analysis uses publicly-available economic information and a simplified approach to bound potential losses. The lower-bound estimate assumes that adequate, equally desirable substitute camping sites exist to offset camping opportunities lost within proposed critical habitat. As such, no impacts to campers are anticipated. The upper-bound estimate makes the simplifying assumption that all camping trips that would normally be taken to sites in proposed critical habitat are foregone (i.e., not taken) during times when neighboring sites are at maximum capacity. It accounts for the possibility that campers will experience welfare losses (i.e., losses resulting when camping experiences are diminished, because they must visit less preferable sites elsewhere in the county, or because they choose to camp less frequently).

123. The actual impact likely falls between these two bounds. Under the assumption that the probability distribution of impacts between these two bounds is continuous, and because there is no evidence to suggest that the distribution is skewed toward either bound, the average of the two estimates represents the best estimate of camping impacts. As shown in Exhibit 4-1, the best estimate of ongoing skipper conservation activities on recreational camping activities are estimated to be $5.7 million (undiscounted dollars), or as low as $3.3 million applying a discount rate of seven percent.

EXHIBIT 4-1 SUMMARY OF BEST ESTIMATE OF FUTURE IMPACTS TO RECREATIONAL CAMPING ACTIVITIES ($2006)

UNIT	SUBUNIT	UNDISCOUNTED DOLLARS	PRESENT VALUE (3%)	PRESENT VALUE (7%)
1	A. Laguna Meadow	$3,424,000	$2,623,000	$1,940,000
	B. Filaree Flat	$0	$0	$0
	C. Agua Dulce Campground & Horse Meadow	$2,317,000	$1,775,000	$1,313,000
2	A. Mendenhall Valley & Observatory Campground	$0	$0	$0
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	$0	$0	$0
	C. Upper Doane Valley & Girl Scout Camp	$0	$0	$0
	D. Lower French Valley & Lower Doane Valley	$0	$0	$0
	TOTAL:	**$5,741,000**	**$4,398,000**	**$3,254,000**

Note: Totals may not sum due to rounding.

124. This section begins with a brief description of recreational camping activities in areas of proposed critical habitat. Next, the analysis provides an overview of the general methodology and approach used for estimating skipper conservation on recreational camping activities. Then, the analysis presents past and future impacts of skipper conservation activities in areas of proposed critical habitat. The chapter ends with a discussion of the uncertainty inherent in the methodology and provides a best estimate of impacts.

4.1 BACKGROUND

125. According to the proposed rule, recreational activities such as camping can lead to encroachment of exotic vegetation and can cause direct mortality of skipper larvae by trampling. Alteration of host plant distribution and availability, plant canopy closure and availability of resources such as nectar and moisture can result from disturbance by humans.

126. The Cleveland National Forest (CNF) operates 22 campgrounds with over 650 individual campsites. Within areas proposed as critical habitat for the skipper, there are six developed campgrounds across three subunits. Exhibit 4-2 summarizes basic information regarding these campgrounds. Exhibits 4-3 and 4-4 show the general location of CNF's existing campgrounds relative to proposed critical habitat.

EXHIBIT 4-2 EXISTING DEVELOPED CAMPGROUNDS BY SUBUNIT

SUBUNIT	CAMPGROUND	TYPE	SEASON	NUMBER OF CAMPING UNITS	MAXIMUM CAPACITY (PERSONS)
1A	Laguna	Individual	Year-round	104	515
	El Prado	Group	Memorial Day - Columbus Day	5	242
	Horse Heaven	Group	Seasonal	3	60-150
1C	Wooded Hill	Group	Seasonal	1	110
	Agua Dulce	Group	Memorial Day - Columbus Day	2	90
2C	Observatory	Individual	May to November	42	210
			Total:	**157**	**1,317**

Note: Agua Dulce campground is currently closed due to the presence of Laguna Mountains skipper.

EXHIBIT 4-3 GENERAL LOCATION OF CAMPGROUNDS IN UNIT 1: LAGUNA MOUNTAIN

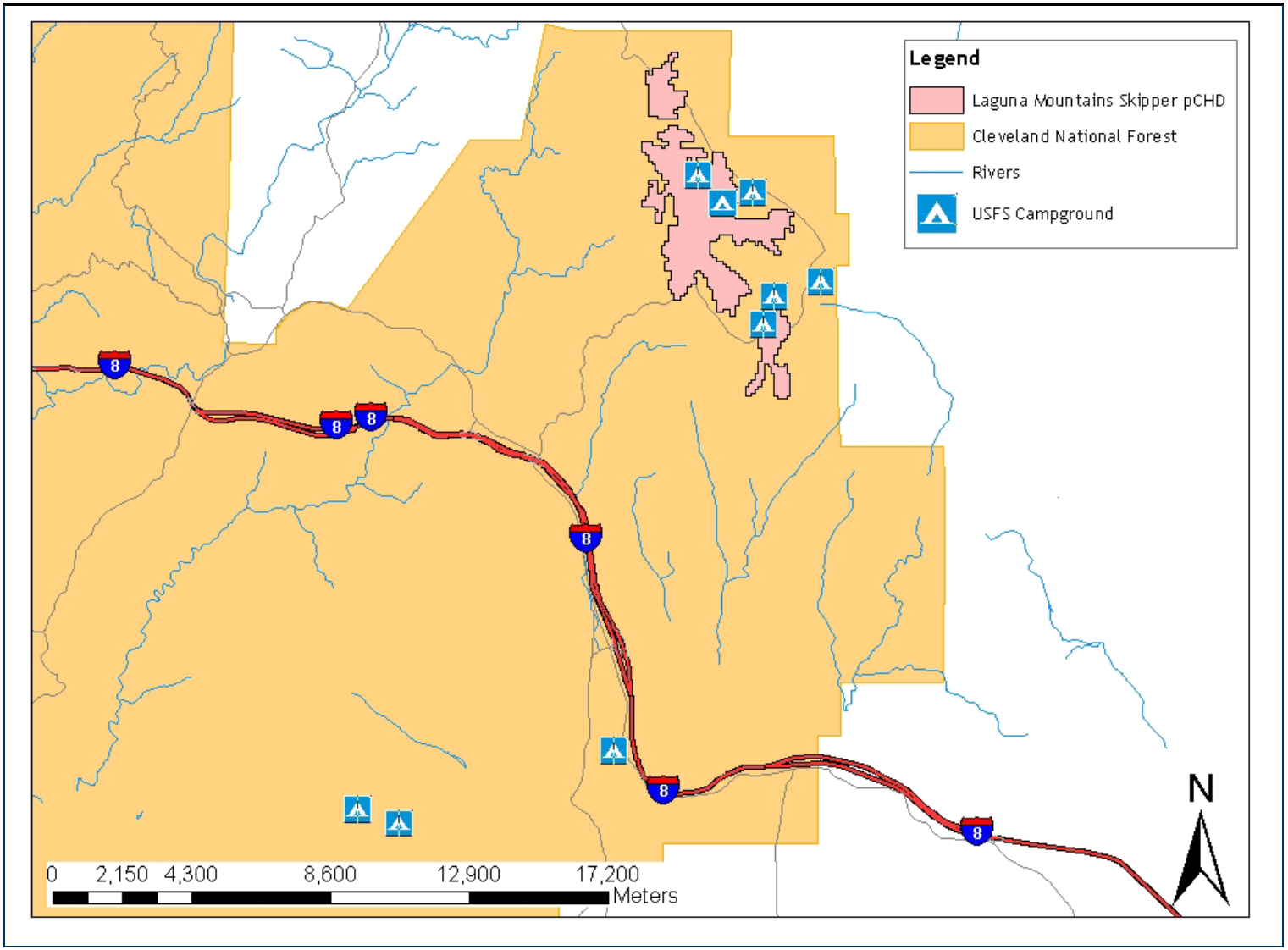
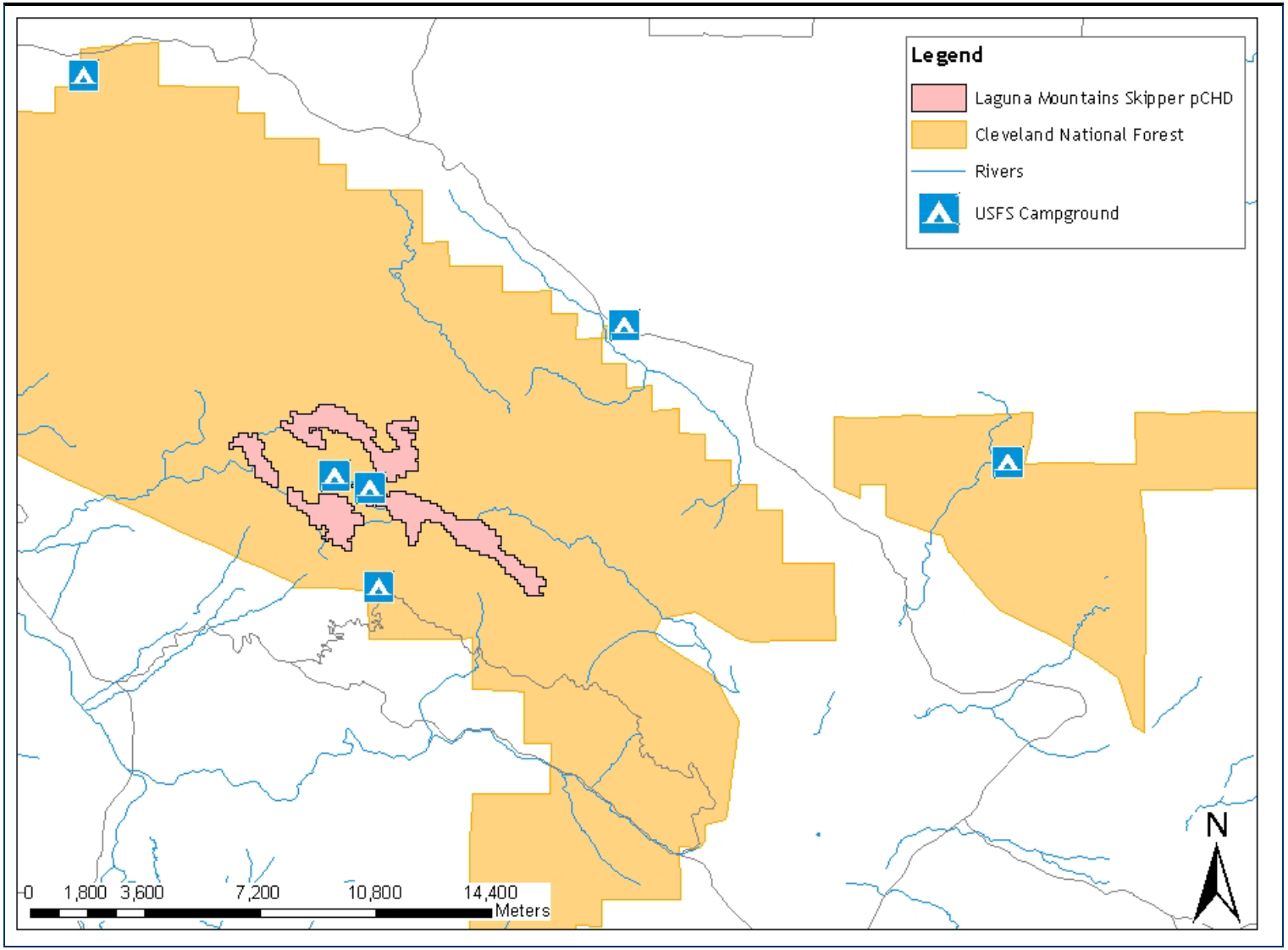


EXHIBIT 4-4 GENERAL LOCATION OF CAMPGROUNDS IN UNIT 2: PALOMAR MOUNTAIN



4.2 APPROACH

127. Past protection measures to mitigate the impact of camping activities on the skipper populations and habitat, include:[53]

- Capacity reductions at campsites located adjacent to recreation exclosures; and
- Closure of campgrounds with large distributions of the skipper's host plant, *Horkelia clevelandii*.

128. Specifically, since the listing of the species in 1997, CNF closed and/or reduced the maximum capacity per camping site at the following campgrounds due to the skipper:

- At Laguna campground, reduced the maximum capacity from eight to six campers per site to two campers per site at ten camping sites adjacent to the meadow exclosure;
- At El Prado campground, reduced the maximum capacity at two group camping sites by 64 people.
- Closed all camping activities at the Agua Dulce campground, including two group camping sites with a total capacity of 90 people.

129. Potential costs associated with the impacts of skipper conservation on camping include the lost social welfare to campers resulting from diminished or lost camping opportunities.[54] The welfare that campers' derive from camping activity is measured in terms of consumer surplus, which refers to the sum of an individual's maximum willingness to pay for services provided by a given natural resource, net of any costs associated with consuming those services. If a particular campsite becomes unavailable to a camper, the welfare loss suffered by the camper is his consumer surplus derived from that site, net of the surplus derived from visiting the next best alternative location or undertaking the next most preferred alternative activity. Exhibit 4-4 suggests that a few alternative camping sites are available within a mile of Unit 2; alternative sites are slightly farther away from Unit 1 (see Exhibit 4-3).

130. To estimate campers' preferences for different camping experiences within an individual's choice set of camping opportunities, and to understand how campers might substitute between campsites, economists survey campers to obtain information about where and how often they camp and use the resulting data to construct econometric models (e.g., site choice models) of behavior. The existing environmental economics literature was searched for publicly-available economic models estimating campers' responses to the elimination of campsites in similar geographic settings that could be transferred to this analysis. No applicable model was identified. As a result, this analysis uses a simplified approach to bound the potential losses.

[53] Chapter 5 addresses costs associated with the installation of interpretive signs and construction of recreation exclosures that impact hiking activities in proposed critical habitat areas.

[54] This analysis does not include the revenue losses from overnight camping fees no longer collected by the U.S. Forest Service (USFS) where campsites are closed or capacity is reduced. The revenue loss borne by the USFS is not a welfare loss, because campers retain the fees to spend at other sites or on other activities.

131. The lower-bound estimate assumes that adequate, equally desirable substitute camping sites exist to offset recreational camping opportunities lost within proposed critical habitat. Therefore, campers' welfare is unchanged. This assumption is valid if the substitute locations offer exactly the same attributes as the current campgrounds (e.g., the areas are equally easy to access, crowd levels are similar, the aesthetic enjoyment gained from experiencing the natural landscape is the same). This estimate likely understates impacts, because the availability of perfect substitutes is unlikely.

132. The upper-bound estimate makes the simplifying assumption that all camping trips that normally would have been taken to sites in proposed critical habitat are foregone (i.e., not taken). It accounts for the possibility that campers will experience welfare losses (i.e., losses occurring when trips are diminished, because either campers decide to go to a second-best location in the area that does not have the same attributes as the current campgrounds or because they take fewer camping trips). According to discussions with CNF staff, campsites affected by skipper conservation activities experience maximum occupancy during the forest's peak season -- weekend days during the summer. As a result, this analysis only assumes camping trips are lost when campgrounds are at full capacity (i.e., no camping trips are lost during the non-peak season). The analysis transfers welfare values for similar types of camping trips obtained from a technical report prepared for the U.S. Forest Service (USFS) entitled *Updated Outdoor Recreation Use Values on National Forests and Other Public Lands* to value these lost trips.[55] The upper-bound estimate likely overstates impacts, because given the availability of alternate campsite locations, not all trips are likely to be lost.

133. The actual impact likely falls between these two bounds; however information allowing for further refinement of the methodology presented in the chapter is not readily available. Under the assumption that the probability distribution of potential impacts between the two bounds is continuous and not skewed toward either estimate, the average of the two bounds represents a best estimate of impacts. The remainder of this chapter provides a detailed explanation of the data and models used to estimate the upper-bound impacts to recreational camping activities. The chapter concludes with a discussion of the uncertainty inherent in this approach and provides a best estimate of the impacts.

4.3 UPPER BOUND: POTENTIAL IMPACTS ASSUMING ADEQUATE SUBSTITUTE CAMPING SITES ARE NOT AVAILABLE

134. In order to estimate the economic impacts of lost camping trips, the analysis employs a series of methodological steps as described below:

- **Step 1**: Estimate the number of lost trips. No data reporting the actual number of camping trips in proposed critical habitat areas are available. As a result, this analysis relies on information from CNF staff on the annual occupancy rate to estimate the number of camping trips lost as a result of capacity reductions and campground closures within proposed critical habitat.

[55] Loomis, J., *Updated Outdoor Recreation Use Values on National Forests and Other Public Lands*, prepared for the U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-658, October 2005.

- **Step 2**: Estimate the value of a lost camping trip by reviewing the economics literature for studies of recreational camping activities with similar attributes (e.g., same geographic location, land type).
- **Step 3**: Calculate welfare losses by multiplying the estimated number of annual camping trips lost by the appropriate per-trip welfare value obtained in Step 2. Annual losses are then summed over the relevant time period (2000-2005 for past losses and 2006-2025 for future losses).

STEP 1: NUMBER OF TRIPS

135. Since the listing of the species in 1997, CNF closed and/or reduced the maximum capacity per camping site at the three campgrounds in Unit 1. No data reporting the actual number of camping trips in proposed critical habitat areas are available. As a result, to estimate the number of camping trips lost per year, this analysis uses the following information obtained from discussions with CNF staff:

- The number of campsites affected by skipper conservation activities;
- The capacity lost per campsite (in persons) due to skipper conservation activities; and
- An estimate of the number of days per year that campsites affected by skipper conservation activities are experiencing maximum occupancy (i.e., the annual occupancy rate). According to discussions with CNF staff, campsites affected by skipper conservation activities experience maximum occupancy only during the forest's peak season, weekend days during the summer, or approximately 24 to 28 days per year. As a result, this analysis only assumes camping trips are lost when campgrounds are at full capacity (i.e., no camping trips are lost during the non-peak season).

Therefore:

Annual trips = Number of Campsites Affected by Skipper Conservation
x Capacity Lost per Campsite (in number of persons)
x Number of Nights per Year at Full Capacity

As shown in Exhibit 4-5, the estimated number of camping trips lost due to ongoing (2000) skipper conservation activities is approximately 5,352 per year.

EXHIBIT 4-5 ESTIMATED CAMPING TRIPS LOST PER YEAR BY SUBUNIT[1,2]

SUBUNIT	CAMPGROUND	NUMBER OF CAMPSITES AFFECTED BY SKIPPER CONSERVATION ACTIVITIES	CAPACITY PER CAMPSITE (PERSONS)	ANNUAL OCCUPANCY RATE (NIGHTS PER YEAR)	ESTIMATED CAMPING TRIPS LOST PER YEAR
1A	Laguna	10	5	28[3]	1,400
	El Prado	2	32	28[3]	1,792
1C	Agua Dulce	2	45	24[1]	2,160
				Total:	**5,352**

Notes:

[1] Source: Personal communication with Anne Carey, Recreation Officer, USFS, Cleveland National Forest, February 9, 2006.

[2] All campsite restrictions began in 2000.

[3] Equals 14 weekends from Memorial Day to Columbus Day multiplied by two days per weekend.

STEP 2: VALUE PER TRIP

136. To estimate the consumer surplus value of a camping trip, this analysis uses a benefits transfer approach. Benefits transfer involves adapting research conducted to estimate economic values under one set of circumstances to address a new policy question. In this manner, existing valuation research is combined with site-specific data and information to develop a "transferred" estimate. Benefits transfer has been widely applied in policy analysis and is approved for use within the Office of Management and Budget (OMB) guidelines for preparing economic analyses. In this case, existing estimates of consumer surplus value for camping trips are multiplied by estimates of the number of trips not taken due to skipper conservation to estimate consumer surplus losses.

137. Best practice in the conduct of benefits transfer generally involves five steps:

- **Describe conditions to be valued:** Identify and describe in detail the valuation scenario, which in this case involves the nature and extent of camping opportunities in CNF, the nature and extent of management restrictions present, and the manner in which these restrictions may affect camper behavior.
- **Identify relevant research:** Conduct a detailed search for relevant research in the economics literature.
- **Review research for quality and applicability:** Review relevant research carefully for quality and specific applicability.
- **Transfer economic values:** Apply the valuation information identified to the conditions being valued; in this case, to estimated changes in welfare associated with fewer camping trips to campgrounds within proposed critical habitat areas.

- **Address uncertainty:** Evaluate assumptions made in the process of transferring economic values and the sensitivity of final impact estimates to such assumptions.[56]

138. The nature and extent of camping opportunities in critical habitat areas are discussed earlier in this chapter, and the potential for lost trips is quantified in Step 1 of this section. In summary, the affected campsites are located in CNF in San Deigo County, California. The sites are accessible by road and are developed to accommodate single campers or groups as large as 45 people.

139. To identify relevant research, the analysis relies on a survey of recreational use values prepared in 2005 by Dr. John Loomis, called *Updated Outdoor Recreation Use Values on National Forests and Other Public Lands*.[57] Published by the USFS, the report summarizes several decades of literature on the net economic value of 30 recreational activities across the country. It updates past reviews and is intended for use by forest managers as they conduct assessments under the Forest and Rangeland Renewable Resources Planning Act (RPA), the National Forest Management Act (NFMA), and the Government Performance and Results Act (GPRA).

140. Loomis presents average consumer surplus values per person per day by activity for six different regions of the United States. Data are aggregated at the regional level to increase sample sizes. He identifies three studies reporting surplus values for camping in the Pacific Coast region, including Washington, Oregon, and California. All three studies rely on revealed preference methods, which are generally considered to be more reliable than stated preference methods. From these studies, Loomis obtains two estimates for sites in California and two for Washington. Specifically:

- In a technical report published by the USFS, McCollum et al. (1990) estimate a travel cost model using survey data collected 56 national forests in the United States.[58] The authors present results specifically for California forests, where approximately half of the respondents were surveyed at Angeles National Forest located to the northwest of the forest of interest in this analysis. The authors present costs separately for developed and primitive camping. Loomis extracts a consumer surplus value of $7.45 per person per day (2004 dollars). It appears that he estimates a value most closely resembling the value reported by McCollum et al. for developed camping. The authors of this study note, "[c]oncern was also expressed over low values in some regions for developed camping and primitive camping. We share some of those concerns. The values reported here for some

[56] U.S. Environmental Protection Agency (EPA), *Guidelines for Preparing Economic Analyses, EPA 240-R-00-003*, pp. 86-87, September 2000; and Office of Management and Budget (OMB), *Circular A-4*, pp. 24-26, September 17, 2003.

[57] Loomis, J., *Updated Outdoor Recreation Use Values on National Forests and Other Public Lands*, prepared for the U.S. Department of Agriculture, USFS, Pacific Northwest Research Station, General Technical Report PNW-GTR-658, October 2005.

[58] McCollum, D.W., Peterson, G.L., Arnold, J.R., Markstrom, D.C., and D.M. Hellerstein, The Net Economic Value of Recreation on the National Forests: Twelve Types of Primary Activity Trips Across Nine Forest Service Regions, prepared for the U.S. Department of Agriculture, USFS, Rocky Mountain Forest and Range Experimentation Station, Research Paper RM-289, February 1990.

regions and primary activity trip types are low compared to those reported elsewhere."[59]

- In a subsequent report for the USFS, , Bergstrom et al. (1996) estimate a travel cost model using survey data collected at 350 sites across the United States. Their report does not provide a California-specific value. However, they identify a value of $224.53 per person per trip (2004 dollars) for developed and primitive camping on public lands in the Desert Southwest, a region including California, and parts of southern Nevada, Arizona, New Mexico, and Texas. They also report a value for developed and primitive camping on public lands in the Pacific Northwest, including western Oregon and Washington, of $75.28 per person per day. The authors note that in both cases, "the value does not fall into the range of values reported in previous studies."[60]
- Englin et al. (1991) published a study using camping permits to estimate a travel cost model predicting values associated with marginal and non-marginal changes to four forests in Washington.[61,62] Because campsites are located in designated wilderness areas, these are likely primitive sites. Loomis converts the reported per trip surplus value for camping to a per person per trip value of $110.16 (2004 dollars).[63]

141. Loomis reports the average of these four values, $107.26 (2005 dollars), as the per person per day consumer surplus value of camping on the Pacific Coast (California, Oregon and Washington).[64] Given the large range of values identified in these studies, the analysis of welfare losses associated with efforts to protect Laguna Mountains skipper and its habitat transfers Loomis' average value. The direction of potential bias of this estimate is unknown.

[59] The available dataset used in McCollum (1990) does not contain information on the "number of trips" for each visitor. Consequently, McCollum is required to use a methodology known as "Reverse Gravity Multinomial Logit Model." However, this methodology is relatively uncommon and, as a result, some uncertainty exists in using this methodology.

[60] Bergstrom (1996) uses a truncated Poisson trip count model. As a result of truncation at zero, surplus values reported in Bergstrom are for individuals who have already decided to go camping.

[61] Englin, J. and R. Mendelsohn, "A Hedonic Travel Cost Analysis for Valuation of Multiple Components of Site Quality: The Recreation Value of Forest Management," *Journal of Environmental Economics and Management*, 1991, Vol. 21, pp. 275-290.

[62] The demographics of Washington State campsite users in 1980 may not accurately represent the demographics of campsite users in San Diego County in 2005.

[63] Reconstruction of the $110.16 (2004) value reported in Loomis (2005) from the original Englin et al. (1991) study was not possible.

[64] Value adjusted by IEc from 2004 to 2005 dollars using the GDP Implicit Price Deflator, Table 1.1.9. Implicit Price Deflators for Gross Domestic Product, U.S. Department of Commerce, Bureau of Economic Analysis. February 2005.

STEP 3: WELFARE LOSS ESTIMATION

142. To estimate aggregate recreational camping welfare losses on an annual basis, the per trip value identified in Step 2 is multiplied by estimates of annual camping trips calculated in Step 1. Annual losses are then summed over the relevant time period. Past welfare losses are calculated from 2000 (the first year of the campsite restrictions) to 2005, while future losses are calculated from 2006 to 2025.

143. Past welfare losses are estimated at approximately $3.4 million (undiscounted dollars). Applying discount rates of three and seven percent yields a total past present value of $3.8 million and $4.4 million (Exhibit 4-6).

144. Total future welfare losses are estimated at approximately $11.5 million (undiscounted dollars). Applying discount rates of three and seven percent yields total future present values of $8.8 million and $6.5 million (Exhibit 4-7). Note that the welfare losses forecast in these subunits result from past conservation measures to restrict camping to protect the skipper and its habitat.

EXHIBIT 4-6 SUMMARY OF UPPER-BOUND PAST IMPACTS TO RECREATIONAL CAMPING ACTIVITIES, 1997-2005 ($2006)

UNIT	SUBUNIT	AVERAGE ANNUAL TRIPS LOST	AVEAGE ANNUAL WELFARE LOSS*	UNDISCOUNTED DOLLARS	PRESENT VALUE (3%)	PRESENT VALUE (7%)
1	A. Laguna Meadow	3,192	$342,372	$2,054,000	$2,281,000	$2,621,000
	B. Filaree Flat	0		$0	$0	$0
	C. Agua Dulce Campground & Horse Meadow	2,160	$231,680	$1,390,000	$1,544,000	$1,773,000
2	A. Mendenhall Valley & Observatory Campground	0	$0	$0	$0	$0
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	0	$0	$0	$0	$0
	C. Upper Doane Valley & Girl Scout Camp	0	$0	$0	$0	$0
	D. Lower French Valley & Lower Doane Valley	0	$0	$0	$0	$0
	Total Welfare Losses:	**5,352**	**$574,052**	**$3,444,000**	**$3,825,000**	**$4,394,000**

Note: Totals may not sum due to rounding.
* Assumes a camping welfare value of $107.26 (2005 dollars) per person per day.

EXHIBIT 4-7 SUMMARY OF UPPER-BOUND FUTURE IMPACTS TO RECREATIONAL CAMPING ACTIVITIES, 2006-2025 ($2006)

UNIT	SUBUNIT	AVERAGE ANNUAL TRIPS LOST	AVEAGE ANNUAL WELFARE LOSS*	UNDISCOUNTED DOLLARS	PRESENT VALUE (3%)	PRESENT VALUE (7%)
1	A. Laguna Meadow	3,192	$342,372	$6,847,000	$5,246,000	$3,881,000
	B. Filaree Flat	0		$0	$0	$0
	C. Agua Dulce Campground & Horse Meadow	2,160	$231,680	$4,634,000	$3,550,000	$2,626,000
2	A. Mendenhall Valley & Observatory Campground	0	$0	$0	$0	$0
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	0	$0	$0	$0	$0
	C. Upper Doane Valley & Girl Scout Camp	0	$0	$0	$0	$0
	D. Lower French Valley & Lower Doane Valley	0	$0	$0	$0	$0
	Total Welfare Losses:	**5,352**	**$574,052**	**$11,481,000**	**$8,797,000**	**$6,507,000**

Note: Totals may not sum due to rounding.
* Assumes a camping welfare value of $107.26 (2005 dollars) per person per day.

4.4 CAVEATS

145. Exhibit 4-8 summarizes the key assumptions of the analysis of economic impacts on camping activities, as well as the potential direction and relative scale of the bias introduced by these assumptions.

EXHIBIT 4-8 CAVEATS TO THE ECONOMIC ANLAYSIS OF IMPACTS TO CAMPING

KEY ASSUMPTION	EFFECT ON IMPACT ESTIMATE
Site-specific changes in the number of trips were not available. The camping activity levels estimated in this analysis may be an under- or overestimate of the true camping activity levels.	+/-
The value of a recreational camping trip applied in this analysis may be an under- or overestimate of the true camping losses within proposed critical habitat. Site-specific trip values for campgrounds within proposed critical habitat were not available, and the literature may not accurately reflect these sites.	+/-
- : This assumption may result in an underestimate of real costs. + : This assumption may result in an overestimate of real costs. +/-: This assumption has an unknown effect on estimates.	

146. More importantly, significant uncertainty exists regarding the decisions made by campers in response to skipper conservation activities in proposed critical habitat. This analysis uses readily available data to bound the potential impact of changes in camping opportunities. The actual impact likely falls between these two bounds. Under the assumption that the probability distribution of impacts between these bounds is continuous, and because there is not evidence to suggest that the distribution is skewed toward either bound, the average of the two estimates represents the best estimate of recreational camping impacts presented in Exhibits 4-9 and 4-10.

147. As shown in Exhibit 4-9, the best estimate of past impacts is $1.7 million (undiscounted dollars) and may be as high as $2.2 million assuming a discount rate of seven percent. Exhibit 4-10 presents the best estimate of future impacts, $5.7 million (undiscounted dollars). Assuming a discount rate of seven percent, the best estimate is $3.3 million.

EXHIBIT 4-9 SUMMARY OF PAST IMPACTS TO RECREATIONAL CAMPING ACTIVITIES IN PROPOSED CRITICAL HABITAT ($2006)

UNIT	UNDISCOUNTED DOLLARS			PRESENT VALUE (3%)			PRESENT VALUE (7%)		
	LOWER-BOUND	BEST ESTIMATE	UPPER-BOUND	LOWER-BOUND	BEST ESTIMATE	UPPER-BOUND	LOWER-BOUND	BEST ESTIMATE	UPPER-BOUND
1A	$0	$1,027,000	$2,054,230	$0	$1,141,000	$2,281,038	$0	$1,310,000	$2,620,520
1B	$0	$0	$0	$0	$0	$0	$0	$0	$0
1C	$0	$695,000	$1,390,081	$0	$772,000	$1,543,560	$0	$887,000	$1,773,284
2A	$0	$0	$0	$0	$0	$0	$0	$0	$0
2B	$0	$0	$0	$0	$0	$0	$0	$0	$0
2C	$0	$0	$0	$0	$0	$0	$0	$0	$0
2D	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL:	**$0**	**$1,722,000**	**$3,444,311**	**$0**	**$1,912,000**	**$3,824,598**	**$0**	**$2,197,000**	**$4,393,804**

Notes:

1 Totals may not sum due to rounding.

2 Because the probability of distribution of impacts between these bounds is continuous, and there is no evidence to suggest that the distribution is skewed toward either bound, the best estimate of camping impacts is average of the lower-bound and upper bound estimates.

EXHIBIT 4-10 SUMMARY OF FUTURE IMPACTS TO RECREATIONAL CAMPING ACTIVITIES IN PROPOSED CRITICAL HABITAT ($2006)

UNIT	UNDISCOUNTED DOLLARS			PRESENT VALUE (3%)			PRESENT VALUE (7%)		
	LOWER-BOUND	BEST ESTIMATE	UPPER-BOUND	LOWER-BOUND	BEST ESTIMATE	UPPER-BOUND	LOWER-BOUND	BEST ESTIMATE	UPPER-BOUND
1A	$0	$3,424,000	$6,847,434	$0	$2,623,000	$5,246,435	$0	$1,940,000	$3,880,987
1B	$0	$0	$0	$0	$0	$0	$0	$0	$0
1C	$0	$2,317,000	$4,633,602	$0	$1,775,000	$3,550,219	$0	$1,313,000	$2,626,232
2A	$0	$0	$0	$0	$0	$0	$0	$0	$0
2B	$0	$0	$0	$0	$0	$0	$0	$0	$0
2C	$0	$0	$0	$0	$0	$0	$0	$0	$0
2D	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL:	**$0**	**$5,741,000**	**$11,481,036**	**$0**	**$4,398,000**	**$8,796,654**	**$0**	**$3,254,000**	**$6,507,219**

Notes:

1 Totals may not sum due to rounding.

2 Because the probability of distribution of impacts between these bounds is continuous, and there is no evidence to suggest that the distribution is skewed toward either bound, the best estimate of camping impacts is average of the lower-bound and upper bound estimates.

CHAPTER 5 | POTENTIAL ECONOMIC IMPACTS TO HIKING ACTIVITIES

148. This section considers how skipper conservation activities may impact hiking activities in areas that contain proposed critical habitat. According to the proposed rule, recreational activities such as hiking can cause direct mortality of skipper larvae by trampling. Past conservation measures on hiking activities have included installation of interpretive signs and construction of recreation exclosures.

149. Since the listing of the species, past impacts on hiking activities are estimated to be $37,000 (undiscounted dollars). Applying discount rates of three and seven percent yields a total present value of $43,000 and $50,000 (Exhibit 5-3). Future impacts on hiking activities are estimated $107,000 (undiscounted dollars). Applying discount rates of three and seven percent yields a total present value of $85,000 and $67,000 (Exhibit 5-3). The majority (48 percent) of the estimated future impacts results from ongoing conservation activities in Subunit 1A.

150. This section is begins with a brief description of recreational hiking activities in areas of proposed critical habitat. Next, the analysis provides an overview of the general methodology and approach used for estimating skipper conservation activities on recreational hiking activities. Then, the analysis presents past and future costs of skipper conservation on hiking activities in areas of proposed critical habitat.

5.1 BACKGROUND

151. According to the proposed rule, recreational activities such as camping can lead to encroachment of exotic vegetation and can cause direct mortality of skipper larvae by trampling. Alteration of host plant distribution and availability, plant canopy closure and availability of resources such as nectar and moisture can result from disturbance by humans.

152. The Cleveland National Forest (CNF) provides over 340 miles of hiking trails throughout the forest. Exhibits 5-1 and 5-2 show the general location of CNF's existing hiking trail areas relative to proposed critical habitat.

In 2000 and 2001, CNF implemented a series of conservation measures aimed at protecting the skipper and its habitat. CNF installed interpretive signs to educate recreators about the skipper, and installed two recreation exclosures to protect the skipper's host plan, *Horkelia clevelandii*. The first exclosure is small, approximately 20 feet by 30 feet, and is located on the eastern edge of the Observatory campground (Subunit 2A). In Subunit 1A, CNF installed its largest recreation exclosure for the skipper, approximately 1.20 acres, between the Laguna and El Prado campgrounds.

EXHIBIT 5-1 GENERAL LOCATION OF HIKING AREAS/TRAILS IN UNIT 1: LAGUNA MOUNTAIN

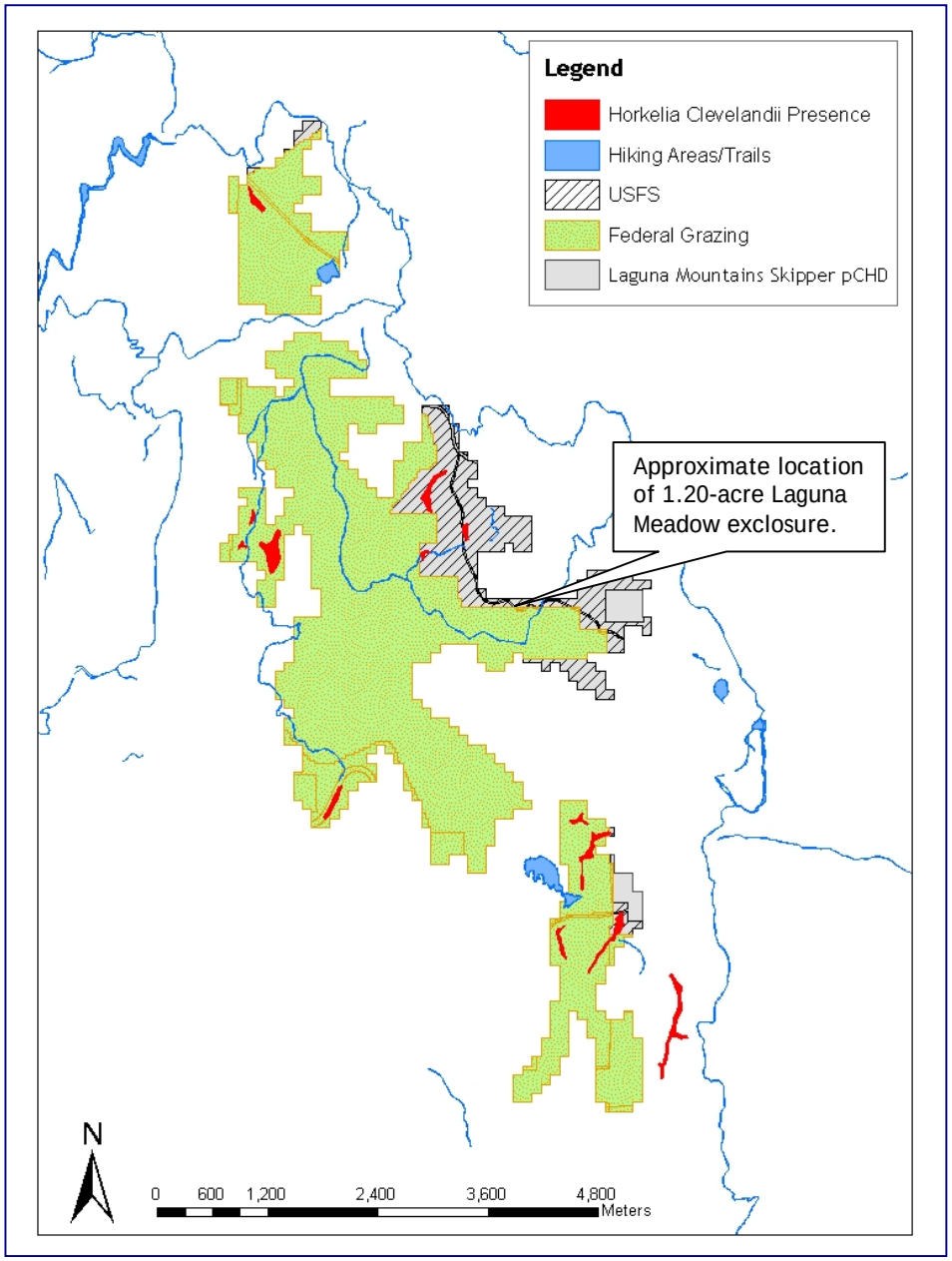
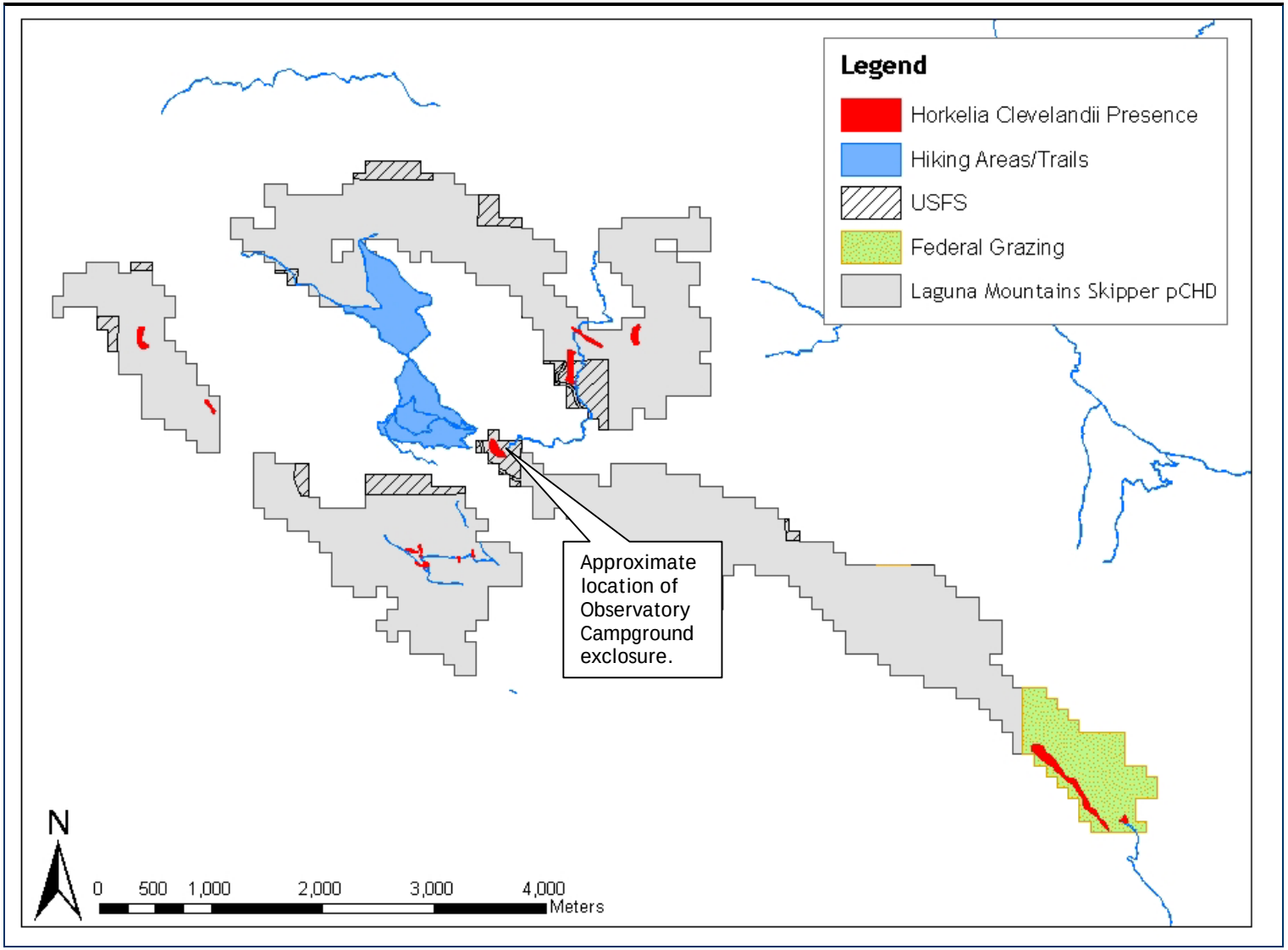


EXHIBIT 5-2 GENERAL LOCATION OF HIKING AREAS/TRAILS IN UNIT 2: PALOMAR MOUNTAIN



5.2 PAST IMPACTS

153. Costs of exclosure construction and signage installation were obtained from CNF staff. The initial cost of the large Laguna Meadow exclosure was approximately $12,000 plus $1,000 per year for ongoing maintenance.[65] CNF staff estimate smaller exclosures cost approximately $20,000 per mile. Installation and maintenance of interpretive signs across the CNF, cost approximately $10,000 every five years for all recreational activities, including camping and hiking.

154. As shown in Exhibit 5-3, past impacts to hiking activities are estimated for Subunit 1A and Subunit 2A at approximately $37,000 (undiscounted dollars). Applying discount rates of three and seven percent yield total present values of $43,000 and $50,000, respectively.

5.3 FUTURE IMPACTS

155. Future costs for Subunits 1A and 2A are assumed to continue in the future. In addition to these exclosures, two additional patches of the skipper's host plant were identified on CNF lands in Subunits 1C and 2B (see Exhibits 5-1 and 5-1). This analysis assumes that these additional areas of *Horkelia clevelandii* presence will need to be excluded from recreator use. Exclosure costs are estimated at $20,000 per mile for each additional exclosure: approximately 0.38 miles in Subunit 1C and 0.31 miles in Subunit 2B.

156. As shown in Exhibit 5-3, past impacts to hiking activities is estimated at $107,000 (undiscounted dollars). Applying discount rates of three and seven percent yield total present values of $85,000 and $67,000, respectively.

5.4 ESTIMATING THE LOSS ASSOCIATED WITH DIMINISHED RECREATIONAL HIKING OPPORTUNITIES

157. The exclusion of meadow hiking areas may redirect hikers to less desirable routes, diminishing their hiking experience and resulting in welfare loss. Information describing hikers' preferences regarding the specific attributes of these trails is not readily available. In addition, skipper conservation activities do not result in the closure of hiking trails themselves, but rather on meadow areas adjacent to trails. Furthermore, the total miles of hiking trails potentially affected by skipper conservation activities represent a small percentage (i.e., less than one percent) of the total miles of hiking trails available to National Forest visitors. Therefore, because of the availability of many alternate trails, and the fact that all of current trails will remain open, this analysis does not estimate welfare losses to hikers.

[65] USFS Region 5 Website. "Program Accomplishments 2002: Resource Preservation & Enhancement." Accessed on February 10, 2006 online at: http://www.fs.fed.us/r5/sanbernardino/ap/proj-accom-2002-2.html.

EXHIBIT 5-3 SUMMARY OF PAST AND FUTURE IMPACTS ON HIKING ACTIVITIES ($2006)

UNIT	SUBUNIT	PAST (1997-2005)			FUTURE (2006-2025)		
		CONSTANT DOLLARS	PRESENT VALUE, 3%	PRESENT VALUE, 7%	CONSTANT DOLLARS	PRESENT VALUE, 3%	PRESENT VALUE, 7%
1	A. Laguna Meadow	$35,000	$40,000	$48,000	$52,000	$41,000	$32,000
	B. Filaree Flat	$0	$0	$0	$0	$0	$0
	C. Agua Dulce Campground & Horse Meadow	$0	$0	$0	$29,000	$24,000	$20,000
2	A. Mendenhall Valley & Observatory Campground	$2,000	$3,000	$2,000	$3,000	$2,000	$2,000
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	$0	$0	$0	$23,000	$18,000	$13,000
	C. Upper Doane Valley & Girl Scout Camp	$0	$0	$0	$0	$0	$0
	D. Lower French Valley & Lower Doane Valley	$0	$0	$0	$0	$0	$0
	TOTAL:	**$37,000**	**$43,000**	**$50,000**	**$107,000**	**$85,000**	**$67,000**

Note: Totals may not add due to rounding.

CHAPTER 6 | POTENTIAL ECONOMIC IMPACTS TO UTILITY ACTIVITIES

158. Various entities may conduct utility construction and maintenance activities within proposed critical habitat areas. This chapter is divided into two parts. First, a background discussion is presented that identifies potential impacts to the skipper and its habitat from utility activities and those areas within the proposed designation where utility activities are most likely to occur. Next, impacts to utility activities are estimated based on the costs associated with conducting presence/absence surveys of the skipper and its habitat prior to project commencement and the cost of employing an on-site biologist during utility activities to ensure no damages result to the skipper or its habitat.[66]

159. Exhibit 6-1 summarizes the future impacts to utilities due to skipper conservation activities. Impacts associated with the incremental project costs of presence/absence surveys and an on-site biologist are estimated to range from $32,000 to $2 million (undiscounted dollars). This range is primarily driven by the fact that the costs per project are highly variable depending on the length of the utility project, which can vary from one day to over a month. The remainder of the chapter describes the calculation of costs presented in Exhibit 6-1.

160. Past impacts are limited to one project on an underground utility cable in Subunit 1A, which required a survey of the project area for the skipper's host plant. The estimated cost of this effort is approximately $1,600 (undiscounted dollars).

[66] According to the Service, "it is highly unlikely that listing of the skipper or proposed designation of critical habitat would ever require the utilities companies to relocate 'existing' facilities. Critical habitat does not require a return to pre-project conditions. Such relocation has never been required in any previous consultation with the Service, nor is it likely to be required by CNF." Email communication from the Service's Carlsbad Field Office received April 17, 2006.

EXHIBIT 6-1 SUMMARY OF FORECAST FUTURE IMPACTS OF SKIPPER CONSERVATION ON UTILITY ACTIVITIES, 2006-2025 ($2006)

		UNDISCOUNTED		PRESENT VALUE, 3%		PRESENT VALUE, 7%	
		LOW	HIGH	LOW	HIGH	LOW	HIGH
1	A. Laguna Meadow	$17,000	$1,068,000	$13,000	$818,000	$10,000	$605,000
	B. Filaree Flat	$0	$0	$0	$0	$0	$0
	C. Agua Dulce Campground & Horse Meadow	$0	$0	$0	$0	$0	$0
2	A. Mendenhall Valley & Observatory Campground	$8,000	$476,000	$6,000	$364,000	$4,000	$270,000
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	$7,000	$457,000	$6,000	$350,000	$4,000	$259,000
	C. Upper Doane Valley & Girl Scout Camp	$0	$0	$0	$0	$0	$0
	D. Lower French Valley & Lower Doane Valley	$0	$0	$0	$0	$0	$0
TOTAL:		**$32,000**	**$2,000,000**	**$25,000**	**$1,532,000**	**$18,000**	**$1,134,000**

Note: Totals may not add due to rounding

6.1 SKIPPER CONSERVATION ACTIVITIES AND UTILITY ACTIVITIES

161. Within proposed critical habitat areas, there are a number of phone cables and power transmission lines that require regular maintenance and reconstruction work by entities such as AT&T and San Diego Gas &Electric (SDG&E).[67] Utility activities can impact the physical and biological features essential for conservation of the skipper. For example, utility construction and maintenance activities can destroy skipper host plants and immature life stages of the species.

162. Within proposed critical habitat areas, there are five SDG&E power transmission lines that cross Unit 1 on Laguna Mountain and two power transmission lines that cross Unit 2 on Palomar Mountain.[68] As shown in Exhibit 6-2, there are approximately 276 SDG&E power transmission poles across three subunits in proposed critical habitat areas. On Laguna Mountain, there are approximately 20,000 feet of aerial AT&T cable lines; Palomar Mountain has a significant number of cable lines.[69]

EXHIBIT 6-2 SDG&E AND AT&T UTILITY LINES IN PROPOSED CRITICAL HABITAT AREAS

UNIT	SUBUNIT	NUMBER OF SDG&E POWER TRANSMISSION POLES	LENGTH OF AT&T CABLE LINES (FEET)
1	A. Laguna Meadow	136	20,000 aerial 10,000 underground
	B. Filaree Flat		
	C. Agua Dulce Campground & Horse Meadow		
2	A. Mendenhall Valley & Observatory Campground	70[1]	Not available[2]
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	70[1]	Not available[2]
	C. Upper Doane Valley & Girl Scout Camp		
	D. Lower French Valley & Lower Doane Valley		
	TOTAL:	276	> 30,000[2]

Notes:

[1] On Palomar Mountain, there are 140 transmission poles. At this time of this report, the breakdown of these poles across Subunits 2A and 2B was not available, as a result, this report divides the number of poles evenly across the two subunits.

[2] According to AT&T, there is "quite a lot of [phone line] footage" within Subunits 2A and 2B on Palomar Mountain. However, the exact number of feet was not readily available (Email communication with Mike Mabe, AT&T, March 3, 2006). As a result, the total length of AT&T cable lines is reported here as greater than 30,000 feet.

[67] Note that phone communications in this area were formerly operated by SBC Communications, Inc. (SBC). On November 18, 2005, SBC announced the completion of its acquisition of AT&T Inc. SBC announced that it would adopt the AT&T Inc. name following the close of the merger.

[68] Email communication with Kirsten Winter, Biologist, USFS, Cleveland National Forest, March 14, 2006.

[69] According to AT&T, there "is quite a lot of footage" on Palomar Mountain. The exact number of feet was not available (Email communication with Mike Mabe, AT&T, March 3, 2006).

6.2 PAST IMPACTS

163. According to discussions with Cleveland National Forest (CNF), SDG&E and SBC, past conservation measures to protect the skipper and its habitat have been limited to presence/absence surveys and the administrative costs of writing a biological assessment. Since the listing of the species, there have been two utility projects in proposed critical habitat areas:

- Subunit 1A. Utility maintenance work on an underground powerline requiring a presence/absence survey for the skipper's host plant.
- Subunit 2B. SDG&E pole replacement at the Palomar Fire Station. According to CNF staff, because the fire station is a developed site, no conservation measures were required for this project.

164. Past impacts therefore are limited to the single utility project in Subunit 1A estimated at approximately $1,600 (undiscounted dollars) for two days of biologist and staff time. Applying discount rates of three and seven percent yields a total present value of $1,800 and $1,700, respectively.

6.3 FUTURE IMPACTS

165. According to discussions with CNF, SDG&E and SBC, future conservation measures to protect the skipper and its habitat may include:

- Presence/absence surveys of skipper and its host plant prior to construction or maintenance utility projects and
- On-site presence of an approved skipper biologist during construction or maintenance utility projects.

166. According to an approved skipper biologist, typically a presence/absence survey is first conducted to ensure that no skipper are present in the project area and to determine the presence of the skipper's host plant, *Horkelia clevelandii*. If the skipper's host plant is detected in the project area, the utility may need to consult with the Service and plastic is placed over the entire project area to protect the host plant during utility project activities. The biologist remains on-site during the course of the project to ensure no damage results to the skipper's host plant during project activities and ensures that the area is appropriately cleaned up at the conclusion of project activities.[70]

167. An approved skipper biologist costs approximately $100 per hour, or $800 per day. According to AT&T and SDG&E, the length of utility construction and maintenance projects can vary significantly. For example, simple damages resulting from a tree fall or replacement of one pole can often be completed in a day. In contrast, the Cedar Fire of 2003 resulted in significant utility repair work for both AT&T and SDG&E that lasted well over a month. According to AT&T and SDG&E, utility maintenance and construction projects are infrequent -- only occurring once or twice per year across all proposed critical habitat areas. SDG&E estimates the additional costs due to the skipper

[70] Personal communication with Michael Klein, 10a certified skipper biologist, March 9, 2006.

at approximately $25,000 per project.[71] Based on the information provided, this analysis assumes one to two projects per year per entity (i.e., total of two to four utility projects per year) and costs due to skipper conservation activities ranging from $800 to $25,000 per project.

168. As shown in Exhibit 6-3, aggregate costs from 2006 to 2025 are estimated to be $32,000 to $2 million (undiscounted dollars). This range is driven by the fact that the amount of time spent on-site per project is highly variable. Applying a discount rate of three percent yields a total present value of $25,000 to $1.5 million while a discount rate of seven percent yields a total present value of $18,000 to $1.1 million.

[71] This number seems reasonable as it is equivalent to about 30 days of an approved biologist's time at $100 per hour (i.e., 30 days x 8 hours/day x $100/hour = $24,000), not including the additional costs associated with SDG&E's time to manage an extra level of external project review and coordination.

EXHIBIT 6-3 SUMMARY OF FUTURE IMPACTS OF SKIPPER CONSERVATION ACTIVITIES ON UTILITY ACTIVITIES, 2006-2025 ($2006)

UNIT	SUBUNIT	UTILITY PROJECTS PER YEAR*		CONSTANT DOLLARS		PRESENT VALUE, 3%		PRESENT VALUE, 7%	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
1	A. Laguna Meadow	1	2	$17,000	$1,068,000	$13,000	$818,000	$10,000	$605,000
	B. Filaree Flat	0	0	$0	$0	$0	$0	$0	$0
	C. Agua Dulce Campground & Horse Meadow	0	0	$0	$0	$0	$0	$0	$0
2	A. Mendenhall Valley & Observatory Campground	0.5	1	$8,000	$476,000	$6,000	$364,000	$4,000	$270,000
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	0.5	1	$7,000	$457,000	$6,000	$350,000	$4,000	$259,000
	C. Upper Doane Valley & Girl Scout Camp	0	0	$0	$0	$0	$0	$0	$0
	D. Lower French Valley & Lower Doane Valley	0	0	$0	$0	$0	$0	$0	$0
	TOTAL:	**2**	**4**	**$32,000**	**$2,000,000**	**$25,000**	**$1,532,000**	**$18,000**	**$1,134,000**

Note: Totals may not add due to rounding.

* Costs are allocated to subunits based on the percent of proposed critical habitat acres in each subunit for AT&T and the number of transmission poles for SDG&E (i.e., 136 poles in Subunit 1A and 70 poles each in Subunit 2A and 2B).

CHAPTER 7 | POTENTIAL ECONOMIC IMPACTS TO RURAL DEVELOPMENT ACTIVITIES

169. This section considers how skipper conservation activities may impact rural development activities in areas that contain proposed critical habitat. The first section reviews the private lands contained within the designation. This is followed by an overview of the potential limitations on development for those areas, including current zoning laws as obtained from city and county planning departments.

170. The analysis does not anticipate that the designation of critical habitat and resulting skipper conservation activities will substantially affect or limit private development due to a number of factors. First, private lands within proposed critical habitat are located in remote areas that are generally unsuitable for large-scale development. In addition, typical measures to protect skipper habitat include avoidance of the skipper's host plant, *Horkelia clevelandii*, which is likely to be easily incorporated in building designs given the size of affected parcels and existing density restrictions. As a result, future development in these areas is unlikely to threaten the skipper. However, for reference and to further describe the private lands contained in critical habitat, this section concludes with a summary of the reported assessed value of these private lands.

7.1 PRIVATE LANDS WITHIN PROPOSED CRITICAL HABITAT

171. According to the proposed rule, rural development may result in long-term or permanent fragmentation or destruction of habitat containing primary constituent elements. These activities can reduce the amount of available habitat and directly and indirectly increase the extirpation probability of associated skipper populations.

172. Potentially developable private lands are found in all seven subunits. Exhibits 7-1 and 7-2 provide maps of the location of private lands within each subunit as well as the presence of the skipper's host plant, *Horkelia clevelandii*.

7.2 PAST IMPACTS

173. Within proposed critical habitat, there have been no past consultations or impacts on rural development activities due to skipper conservation activities.

EXHIBIT 7-1 PRIVATE LANDS WITHIN UNIT 1: LAGUNA MOUNTAIN

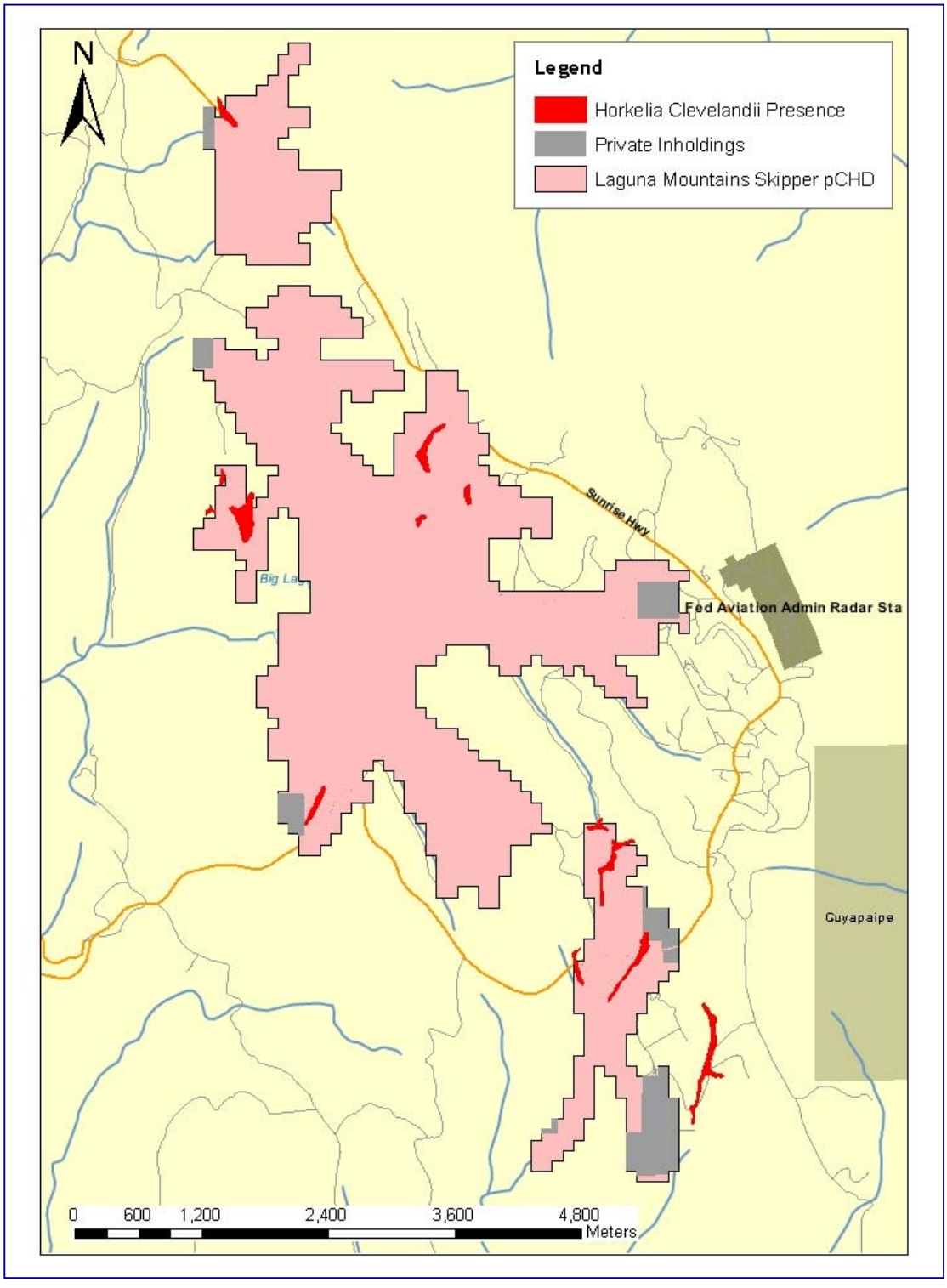
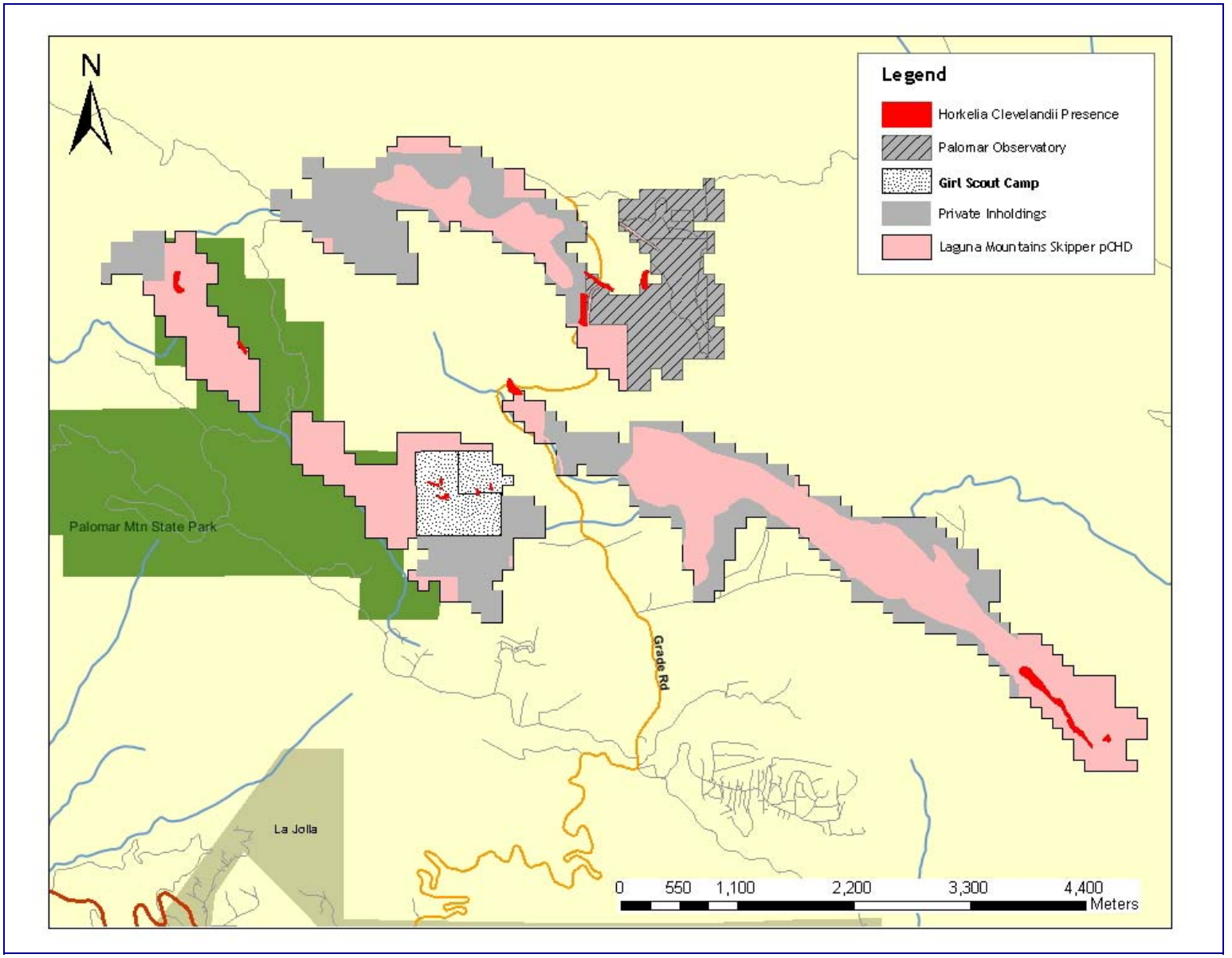


EXHIBIT 7-2 PRIVATE LANDS WITHIN UNIT 2: PALOMAR MOUNTAIN



7.3 FUTURE IMPACTS

174. Skipper conservation activities may impact development in areas proposed as critical habitat in two ways: (1) lands otherwise available for development may be restricted from future development; or (2) development may proceed subject to specific project modifications for skipper conservation. In the skipper's habitat, neither scenario is likely to occur. As described in the following bullet points, current land use patterns and land use regulations indicate that these areas are characterized by low density development that can be configured to avoid impacts to the skipper. Furthermore, current surveys of the skipper's host plant identify only two parcels where the host plant is present on the outer edges of the parcel's boundaries. As a result, future costs are not anticipated.

- **Current Land Use Patterns**. Private lands in proposed critical habitat areas are generally located in relatively remote areas that have not seen much development in the past decade. According to local realtors in the area, development in these areas is characterized by small, rustic cabins, generally 30 to 40 years old, interspersed on large undeveloped tracts of land. Most homes in the area are used primarily as secondary homes and no new home construction has occurred in any of these areas in the past decade.[72]
- **Zoning Laws**. Current zoning laws limit the types of development that may take place on a parcel of land. Potentially developable private lands in areas of proposed critical habitat are governed by zoning laws that make it unlikely that they will be used for large-scale development in the foreseeable future.
    - *Spaced Rural Residential*. The majority of the private lands (89 percent) is identified as Spaced Rural Residential. This land use zone is defined as single family homes located in rural areas with lot sizes of approximately 1 to 10 acres . Homes in areas of lower densities are coded as agricultural or vacant, not residential. Rural residential estates may have small orchards, fields or small storage buildings associated with the residential dwelling unit.
    - *Agricultural*. Approximately 11 percent of private lands within proposed critical habitat areas are zoned as Extensive Agriculture (i.e., described as pasture/fallow). Under this zoning category, development is limited to small cabins similar to the restrictions for Spaced Rural Residential.
- **Skipper Host Plant Presence**. Finally, a review of spatial data on the presence/absence of the skipper's host plant, *Horkelia clevelandii*, identify only two parcels in Subunits 2B and 1C (see Exhibits 7-1 and 7-2) where the host plant species is present along the boundaries of each parcel. Avoidance of the skipper's host plant is likely to be easily incorporated in building designs given the size of affected parcels and the location of the skipper's host plant.

[72] Personal communications with realtors at Matthews and O'Donnell Real Estate (Valley Center, CA); Palomar Mountain and Realty (Pine Valley, CA); Coldwell Banker and Krueger Realty, March 8-9, 2006.

7.4 LAND VALUES ON PRIVATE PARCELS IN PROPOSED CRITICAL HABITAT AREAS

175. Though the analysis does not currently expect any substantial impacts to private development, Exhibit 7-3 presents the reported assessed values of potentially developable private lands contained in proposed critical habitat areas. As shown, the total assessed value of all private lands in proposed critical habitat is approximately $5.3 million.

176. In California, Proposition 13, an initiative passed in June 1978, governs the property assessment process. Proposition 13 included four major provisions: (1) a limit on the ad valorem property tax rate to one percent of the assessed value; (2) a rollback of assessed values to their 1975-1976 levels; (3) a limit on the annual growth in assessed value to a maximum of two percent per year; and (4) limiting property reassessment to current market values only when a change in ownership occurs or new construction takes place.[73] As a result, two identical properties with the same market value could have different assessed values for tax purposes if one of them has been sold since 1975. Information on the year that parcels were last assessed was not readily available from the County Assessor's offices. As a result, the reported land values in Exhibit 7-3 likely understate the current market value of these lands.

EXHIBIT 7-3 REPORTED LAND VALUES BY SUBUNIT

UNIT	SUBUNIT	NUMBER OF PARCELS	CHD ACRES	TOTAL REPORTED LAND VALUE
1	A. Laguna Meadow	3	68	$673,585
	B. Filaree Flat	1	10	$176,891
	C. Agua Dulce Campground & Horse Meadow	19	125	$2,184,159
2	A. Mendenhall Valley & Observatory Campground	35	337	$1,083,972
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	15	389	$447,013
	C. Upper Doane Valley & Girl Scout Camp	5	155	$670,802
	D. Lower French Valley & Lower Doane Valley	2	53	$17,075
	TOTAL:	**80**	**1,136**	**$5,253,497**

Source: San Diego County Assessor's Office.

[73] California. March 2003. State Assessment Manual. California State Board of Equalization.

CHAPTER 8 | POTENTIAL ECONOMIC IMPACTS TO OTHER ACTIVITIES ON FEDERAL AND STATE LANDS

177. Other activities potentially affected by skipper conservation activities include, fuel management, water diversions, skipper surveying and monitoring efforts, and the associated administrative costs of consultations undertaken in accordance with section 7 of the Act.[74]

178. Exhibits 8-1 and 8-2 summarize past and future impacts to the activities discussed in this chapter. The majority of these costs are associated with annual survey and monitoring efforts. Since the listing of the species in 1997, the total impacts range from $284,000 to $321,000 (undiscounted dollars). Applying a discount rate of three percent yields a total present value of $322,000 to $360,000 while a discount rate of seven percent yields a total present value of $373,000 to $420,000.

179. Total future impacts are estimated to be $2.1 million (undiscounted dollars) over the next 20 years. Applying a discount rate of three percent yields a total present value of $1.6 million while a discount rate of seven percent yields a total present value of $1.2 million. The remainder of the chapter describes the calculation of costs presented in Exhibits 8-1 and 8-2.

[74] The proposed rule also identifies logging and paved road construction a threat to the species (70 FR 73708). According to the Cleveland National Forest Supervisor, the forest does not allow commercial logging within Forest boundaries and has no current plans for new road construction (Personal communication with Tina Terrell, Forest Supervisor, Cleveland National Forest, March 8, 2007). Additional information and/or comments are invited on these potential threats, and it is anticipated that any new information received will be included in the final version of this report.

EXHIBIT 8-1 SUMMARY OF PAST IMPACTS OF SKIPPER CONSERVATION ON OTHER ACTIVITIES ON FEDERAL LANDS, 1997-2005 ($2006)

UNIT	SUBUNIT	UNDISCOUNTED DOLLARS		PRESENT VALUE 3%		PRESENT VALUE 7%	
		LOW	HIGH	LOW	HIGH	LOW	HIGH
1	A. Laguna Meadow	$117,000	$137,000	$133,000	$155,000	$156,000	$183,000
	B. Filaree Flat	$14,000	$16,000	$16,000	$17,000	$18,000	$20,000
	C. Agua Dulce Campground & Horse Meadow	$20,000	$22,000	$23,000	$25,000	$26,000	$29,000
2	A. Mendenhall Valley & Observatory Campground	$78,000	$90,000	$87,000	$100,000	$100,000	$114,000
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	$31,000	$31,000	$35,000	$35,000	$40,000	$41,000
	C. Upper Doane Valley & Girl Scout Camp	$17,000	$17,000	$20,000	$20,000	$23,000	$23,000
	D. Lower French Valley & Lower Doane Valley	$7,000	$8,000	$8,000	$8,000	$10,000	$10,000
	TOTAL:	**$284,000**	**$321,000**	**$322,000**	**$360,000**	**$373,000**	**$420,000**

Note: Totals may not sum due to rounding.

EXHIBIT 8-2 SUMMARY OF FORECAST FUTURE IMPACTS OF SKIPPER CONSERVATION ON OTHER ACTIVITIES ON FEDERAL LANDS, 2006-2025 ($2006)

UNIT	SUBUNIT	UNDISCOUNTED DOLLARS	PRESENT VALUE 3%	PRESENT VALUE 7%
1	A. Laguna Meadow	$1,260,000	$986,000	$751,000
	B. Filaree Flat	$159,000	$124,000	$95,000
	C. Agua Dulce Campground & Horse Meadow	$200,000	$157,000	$119,000
2	A. Mendenhall Valley & Observatory Campground	$192,000	$151,000	$116,000
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	$146,000	$112,000	$84,000
	C. Upper Doane Valley & Girl Scout Camp	$87,000	$67,000	$50,000
	D. Lower French Valley & Lower Doane Valley	$25,000	$19,000	$14,000
	TOTAL:	**$2,069,000**	**$1,616,000**	**$1,229,000**

Note: Totals may not sum due to rounding.

8.1 IMPACTS TO FIRE MANAGEMENT ACTIVITIES

180. Cleveland National Forest (CNF) will be conducting forest health and fuels treatment activities across the forest over the next five to 10 years. As part of these efforts, trees will be removed from forested areas within proposed critical habitat. According to the proposed rule, fire management activities, such as tree removal or fuel modification should not adversely modify habitat if carefully managed to minimize or avoid destruction of host plants. Furthermore, according to CNF staff, most fire management activities occur outside of the skipper's primary habitat -- open meadows where the skipper's host plant, *Horkelia clevelandii*, is present.

181. According to CNF staff, additional costs due to the skipper in these areas include:

- Additional survey and flagging of project areas to minimize impacts to the skipper and its habitat, estimated at approximately $350 per day for CNF staff time for a total of ten days per year (or $3,500 per year); and
- Additional planning, analysis and treatment costs to ensure that skipper habitat is avoided, estimated at approximately $2,000 per fuels management project. CNF staff anticipates that three fuels management projects per year will overlap with areas proposed as critical habitat for the skipper (i.e., $6,000 per year).

Note that the use of these methods will not decrease the effectiveness of fire management activities, and thus increase the risk of a catastrophic fire; it will only make the activities more expensive (i.e., additional undiscounted costs of $9,500 per year).

182. Impacts on fire management activities are likely to be greatest in proposed critical habitat areas that overlap with Wildland and Urban Interface (WUI) areas. WUI are areas "where human life, property, and natural resources are in imminent danger from catastrophic wildfire," where houses meet or intermingle with undeveloped wildland vegetation. This makes the WUI a focal area for human-environment conflicts such as wildland fires. As illustrated in Appendix C, proposed critical habitat overlaps with 1,852 WUI acres, or approximately 28 percent of the total 6,662 acres included in the proposed designation.

8.1.1 PAST IMPACTS TO FIRE MANAGEMENT ACTIVITIES

183. According to CNF staff, skipper conservation activities have occurred on fire management activities from 2003 through 2005. Assuming $350 per day for 10 days during this time period, costs are estimated at $10,500 (undiscounted dollars). Applying discount rates of three and seven percent yields total present values of $11,100 and $12,000, respectively (Exhibit 8-3).

8.1.2 FUTURE IMPACTS TO FIRE MANAGEMENT ACTIVITIES

184. As shown in Exhibit 8-3, the cost of future impacts associated with ongoing fire management activities are estimated to be approximately $190,000 (undiscounted dollars) over the next 20 years. Applying a discount rate of three percent yields a total present value of $146,000 while a discount rate of seven percent yields a total present value of $108,000.

EXHIBIT 8-3 SUMMARY OF PAST AND FUTURE IMPACTS OF SKIPPER CONSERVATION ON FIRE MANAGEMENT ACTIVITIES ($2006)*

UNIT	SUBUNIT	OVERLAP WITH WUI (ACRES)	PAST IMPACTS, 2003-2005			FUTURE IMPACTS, 2006-2025		
			UNDISCOUNTED DOLLARS	PRESENT VALUE, 3%	PRESENT VALUE, 7%	UNDISCOUNTED DOLLARS	PRESENT VALUE, 3%	PRESENT VALUE, 7%
1	A: Laguna Meadow	865	$5,000	$5,000	$6,000	$89,000	$68,000	$50,000
	B: Filaree Flat	0	$0	$0	$0	$0	$0	$0
	C: Agua Dulce Campground & Horse Meadow	123	$1,000	$1,000	$1,000	$13,000	$10,000	$7,000
2	A: Mendenahll Valley and Observatory Campground	183	$1,000	$1,000	$1,000	$19,000	$14,000	$11,000
	B: Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	372	$2,000	$2,000	$2,000	$38,000	$29,000	$22,000
	C: Upper Doane Valley & Girl Scout Camp	309	$2,000	$2,000	$2,000	$32,000	$24,000	$18,000
	D: Lower French Valley & Lower Doane Valley	0	$0	$0	$0	$0	$0	$0
	TOTAL:	**1,852**	**$11,000**	**$11,000**	**$12,000**	**$190,000**	**$146,000**	**$108,000**

Note: Totals may not sum due to rounding.

* Costs are allocated to subunits based on the percent of WUI acres in each subunit.

8.2 IMPACTS TO WATER DIVERSION ACTIVITIES

185. Surface and groundwater management practices are listed among the threats to the essential features that define critical habitat for the skipper. Drying of meadows results in vegetation changes that could eliminate primary constituent elements within skipper habitat (e.g. host plants and surface moisture). The proposed rule recommends monitoring of the potential changes in hydrology caused by stream and groundwater diversions as well as any necessary management to prevent habitat conversion.

186. According to the proposed rule, commercial drinking water projects and private stream alterations are currently diverting stream and groundwater resources to an unknown extent on Palomar Mountain (Unit 2). To understand the impacts of stream and groundwater diversions on local hydrology and the skipper's meadow habitats would require a detailed system-wide model that incorporates withdrawal data for all water projects in the area with local hydrologic pathways and conditions. Such models do not exist for the Palomar Mountain region. As a result, this analysis is limited to providing a qualitative description of the existing water projects operating on Palomar Mountain.

Small Water Systems

187. As shown in Exhibit 8-4, in the Palomar Mountain area there are seven small water systems regulated by the San Diego County Department of Environmental Health. At this time, data on the volume of water withdrawn by these systems are not available.

EXHIBIT 8-4 SUMMARY OF SMALL WATER SYSTEMS REGULATED BY SAN DIEGO COUNTY ON PALOMAR MOUNTAIN

SUBUNIT	NUMBER OF SERVICE CONNECTIONS	END USE OF WATER	SYSTEM START DATE
Palomar Mountain Mutual Water Company	196	Domestic	1960
Bailey Mutual Water Company	41	Domestic	1952
Palomar Observatory	20	Commercial	1959
Fry Creek Observatory	18	Commercial	1993
Palomar Christian Conference Center	5	Commercial	1971
Yoga Center Retreat	5	Commercial	1968
Yoga Center Mother's Kitchen	4	Commercial	1990
TOTAL:	**289**		

Source: Email communication with Wendy Martinez, Environmental Health Specialist, San Diego County Department of Environmental Health, March 9, 2006.

Palomar Mountain Spring Water Company

188. In addition to these small operators, there is one commercial bottling water company that obtains water from the Palomar Mountain area, the Palomar Mountain Spring Water Company ("Palomar"). Based in Escondido, CA, Palomar is a private water bottling company that ships water in single-serving sizes and gallon containers. Palomar water products are distributed in retail stores throughout California and in specific locations in Arizona, Nevada and Mexico. Palomar derives its water from 19 springs within 160

acres of private lands on Palomar Mountain.[75] According to discussions with Palomar, the company does not own or manage any of the Palomar Mountain springs, rather they hold delivery contracts with the one of the parties on the mountain.[76]

189. Additional information and/or comments are invited on these water entities and the potential threats, if any. It is anticipated that any new information received will be included in the final version of this report.

8.3 SCIENTIFIC STUDIES

190. In 2001, USFS consulted with the Service on the impact of federal grazing activities on the skipper and its habitat. As part of the conservation measures included in the consultation, USFS was required to undertake a study to examine the impact of grazing on the skipper's host plant, *Horkelia clevelandii*. The Mendenhall allotment in Subunit 2A was selected as the study site. Data collection began in 2001 and continued in 2002, 2003 and 2005. The final year of data collection is scheduled for 2007. Annual costs are estimated at approximately $10,000 per year.[77] Since 2001, past costs are estimated at $40,000 (undiscounted dollars). Applying discount rates of three and seven percent yields a total present value of $44,000 and $50,000, respectively. Future costs are limited to one year of data collection in 2007 estimated at $10,000 (undiscounted dollars). Applying discount rates of three and seven percent yields a total present value of $9,700 and $9,300, respectively.

8.4 SURVEY AND MONITORING

191. Various agencies (e.g., USFS, State of California) conduct skipper surveying and monitoring throughout the CNF. According to the Service and CNF staff, annual costs associated with skipper surveying and monitoring are approximately $25,000 per year beginning in 1999.

192. In addition, between 2000 and 2004, Palomar State Park contracted San Diego State University to conduct a survey and habitat analysis for the skipper in Cuyamaca Rancho and Palomar Mountain State Parks. This work cost $14,294 over four years (undiscounted dollars). No skippers were found in those areas surveyed and as a result, Palomar State Park has discontinued surveying efforts in these areas.

193. Exhibit 8-5 provides a summary of past and future survey and monitoring costs by subunit.[78] Past costs of skipper survey and monitoring efforts total $189,000 (undiscounted dollars). Applying discount rates of three and seven percent yields a total present value of $214,000 and $251,000. Future costs of ongoing skipper survey and

[75] Spring water is defined as water that comes out of the ground on its own, thus it is a point whether groundwater flows out of the ground, where the aquifer surface meets the ground surface. Depending on how constant the source of the water is -- rainfall or snowmelt that infiltrates the earth -- springs can be ephemeral (intermittent), perennial (continuous) or artesian. When springs leave the ground they may form pools or streams.

[76] Email communication with Conrad Pawelski, Palomar Mountain Spring Water, March 14, 2006.

[77] Email communication with Jan Beyers, Plant Ecologist, USDA Forest Service, Pacific Southwest Research Station, March 1, 2006.

[78] Costs are allocated to subunits based on the percent of proposed critical habitat acres in each subunit.

EXHIBIT 8-5 SUMMARY OF PAST AND FORECAST FUTURE IMPACTS OF SKIPPER SURVEY AND MONITORING COSTS ($2006)

UNIT	SUBUNIT*	PAST COSTS (2002-2005)			FUTURE COSTS (2006-2025)		
		UNDISCOUNTED DOLLARS	PRESENT VALUE (3%)	PRESENT VALUE (7%)	UNDISCOUNTED DOLLARS	PRESENT VALUE (3%)	PRESENT VALUE (7%)
1	A: Laguna Meadow	$80,000	$91,000	$107,000	$212,000	$163,000	$120,000
	B: Filaree Flat	$11,000	$12,000	$15,000	$29,000	$22,000	$17,000
	C: Agua Dulce Campground & Horse Meadow	$16,000	$18,000	$21,000	$41,000	$31,000	$23,000
2	A: Mendenahll Valley and Observatory Campground	$31,000	$35,000	$41,000	$82,000	$63,000	$46,000
	B: Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	$28,000	$32,000	$38,000	$75,000	$57,000	$42,000
	C: Upper Doane Valley & Girl Scout Camp	$16,000	$18,000	$21,000	$41,000	$31,000	$23,000
	D: Lower French Valley & Lower Doane Valley	$7,000	$8,000	$10,000	$20,000	$15,000	$11,000
	TOTAL:	**$189,000**	**$214,000**	**$251,000**	**$500,000**	**$383,000**	**$283,000**

Note: Totals may not add due to rounding.

* Costs are allocated to subunits based on the percent of proposed critical habitat acres in each subunit.

monitoring efforts total $500,000 (undiscounted). Applying discount rates of three and seven percent yields a total present value of $383,000 and $283,000.

8.5 ADMINISTRATIVE COSTS OF SECTION 7 CONSULTATIONS

194. Section 7 of the Act requires Federal agencies (Action agencies) to consult with the Service whenever activities that they undertake, authorize, permit, or fund may affect a listed species or designated critical habitat. This section is divided into two parts that present an estimate of the past and future administrative costs of consultation efforts, respectively.

8.5.1 PAST ADMINISTRATIVE COSTS

195. Estimates of the typical cost of an individual consultation were developed from a review and analysis in 2002 of historical section 7 files from a number of Service field offices around the country. Per consultation cost estimates are based on an average level of effort for low, medium, or high complexity consultations, multiplied by the appropriate labor rates for staff from the Service and other Federal agencies. Costs to the Service and an Action agency of conducting a formal consultation range from $14,000 to $22,000. Costs for a programmatic consultation range from $26,000 to $36,000.

196. Since the listing of the species in 1997, there has been three formal and one informal consultation associated with the skipper. Exhibit 8-6 summarizes past consultations by subunit. As shown in Exhibit 8-8, past costs associated with section 7 consultations are estimated to be $45,000 to $81,000 (undiscounted dollars). In present value terms, costs are $51,000 to $91,000, assuming a three percent discount rate and $61,000 to $107,000, assuming a seven percent discount rate.

8.5.1 FUTURE ADMINISTRATIVE COSTS

197. As shown in Exhibit 8-7, over the next 20 years, CNF staff expect the need to revisit 14 existing consultations in various activities, including grazing, recreation, and fuels management.[79] In addition, CNF anticipate the need to undertake seven new consultations per year for various special use permits, recreation activities and fuels management projects. According to CNF, the extent of the areas proposed for critical habitat are "much greater than then the area previously considered/evaluated as potential skipper habitat." As a result, although CNF has only undertaken a total of four consultations in prior years, the forest expects an increase in the number of consultations due to the larger geographic extent of the proposed designation.[80,81] Based on recent experience, CNF staff expect costs per consultation to range from $6,000 to $12,000 per consultation (see Exhibit 8-7).

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[79] For example, page 4-60 of the FWS consultation manual states: "Section 7 regulations outline four general conditions for reinitiating formal consultation … 4) a new species is listed or critical habitat designated that may be affected by the action" (Email communication with Kirsten Winter, Forest Biologist, Cleveland National Forest on September 14, 2006).

[80] Email communication with Kirsten Winter, Forest Biologist, Cleveland National Forest on September 14, 2006.

[81] According to the Service, over a five year period, it may be possible to consolidate multiple small consultations into one single comprehensive consultation thereby reducing the potential consultations even further (Email communication with Alison Anderson, Fish and Wildlife Service, Carlsbad Office on September 13, 2006)

EXHIBIT 8-7 NUMBER OF FUTURE SECTION 7 CONSULTATIONS AND COST PER SECTION 7 CONSULTATION IN PROPOSED CRITICAL HABITAT AREAS

ACTIVITY	NO. OF CONSULTATIONS	CNF COST PER CONSULTATION
REVISIT EXISTING CONSULTATIONS		
Four grazing allotments	1	$12,000
Approximately 50 special use permits	5	$12,000
Recreation residences	1	$12,000
Four campgrounds	1	$12,000
Recreational trails (approximately 20 miles)	1	$12,000
Infrastructure (e.g., water lines)	1	$12,000
Fuels management projects	4	$12,000
Total:	**14**	**$168,000**
NEW CONSULTATIONS (PER YEAR)		
Special use permits	3	$12,000
Recreation events or facilities	1	$6,000
Fuels management projects	3	$6,000
Total:	**7**	**$60,000**

Source: Email communication with Kirsten Winter, Forest Biologist, Cleveland National Forest on September 8, 2006.

198. It is unknown which subunits will require future consultation. As a result, this analysis distributes the future administrative costs associated with section 7 consultations based on the percent of Federally-proposed critical habitat area in each subunit.[82] In the future, costs associated with section 7 consultation costs are estimated to be $1.4 million (undiscounted dollars) over the next 20 years. In present value terms, costs are $1.1 million, assuming a three percent discount rate; and $828,000, assuming a seven percent discount rate (Exhibit 8-9).

[82] Ibid.

EXHIBIT 8-6 NUMBER OF PAST SECTION 7 CONSULTATIONS IN PROPOSED CRITICAL HABITAT AREAS

UNIT	SUBUNIT	INFORMAL CONSULTATIONS	FORMAL CONSULTATIONS	NOTES
1	A. Laguna Meadow	0	1.60	Grazing & recreation activities
	B. Filaree Flat	0	0.11	Grazing activities
	C. Agua Dulce Campground & Horse Meadow	0	0.17	Grazing & recreation activities
2	A. Mendenhall Valley & Observatory Campground	1	0.12	One past informal consultation on recreation activities at Observatory Campground (2004) and part of two formal consultations on grazing and recreation activities
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	0	0	
	C. Upper Doane Valley & Girl Scout Camp	0	0	
	D. Lower French Valley & Lower Doane Valley	0	0	
Multiple Subunits		0	1	Biological consultation in connection with the Forest Plan (a minimum of a 15-yearr plan).
	TOTAL:	**1**	**3**	

Notes:

[1] One past formal consultation for grazing activities is distributed across subunits based on the acres of Federal grazing lands within each subunit.

[2] One past formal consultation for recreation activities is distributed across subunits 1A, 1C, and 2A based on the acres of Federal non-grazing lands within each subunit.

[3] Costs associated with the one past formal consultation for the 2005 Forest Plan Costs will be distributed across all subunits based on the percent of Federally-proposed critical habitat area in each subunit.

EXHIBIT 8-7 SUMMARY OF PAST SECTION 7 ADMINISTRATIVE COSTS, 2002-2005 ($2006)[1,2,3]

		UNDISCOUNTED DOLLARS		PRESENT VALUE, 3%		PRESENT VALUE, 7%	
UNIT	SUBUNIT	LOW	HIGH	LOW	HIGH	LOW	HIGH
1	A. Laguna Meadow	$32,000	$51,000	$37,000	$59,000	$44,000	$71,000
	B. Filaree Flat	$3,000	$5,000	$3,000	$5,000	$4,000	$6,000
	C. Agua Dulce Campground & Horse Meadow	$4,000	$6,000	$4,000	$7,000	$5,000	$8,000
2	A. Mendenhall Valley & Observatory Campground	$6,000	$18,000	$7,000	$19,000	$7,000	$22,000
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	$0	$1,000	$0	$1,000	$0	$1,000
	C. Upper Doane Valley & Girl Scout Camp	$0	$0	$0	$0	$0	$0
	D. Lower French Valley & Lower Doane Valley	$0	$0	$0	$0	$0	$0
	TOTAL:	**$45,000**	**$81,000**	**$51,000**	**$91,000**	**$61,000**	**$107,000**

Notes: Totals may not add due to rounding.
[1] One past formal consultation for grazing activities is allocated across subunits based on the acres of Federal grazing lands within each subunit.
[2] One past formal consultation for recreation activities is allocated across subunits 1A, 1C, and 2A based on the acres of Federal non-grazing lands within each subunit.
[3] One past formal consultation for the 2005 Forest Plan Costs is allocated across subunits based on the percent of Federally-proposed critical habitat area in each subunit.

EXHIBIT 8-8 SUMMARY OF FUTURE SECTION 7 ADMINISTRATIVE COSTS, 2006-2025 ($2006)

UNIT	SUBUNIT	UNDISCOUNTED DOLLARS	PRESENT VALUE, 3%	PRESENT VALUE, 7%
1	A. Laguna Meadow	$959,000	$756,000	$580,000
	B. Filaree Flat	$130,000	$102,000	$78,000
	C. Agua Dulce Campground & Horse Meadow	$147,000	$116,000	$89,000
2	A. Mendenhall Valley & Observatory Campground	$81,000	$64,000	$49,000
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	$33,000	$26,000	$20,000
	C. Upper Doane Valley & Girl Scout Camp	$14,000	$11,000	$8,000
	D. Lower French Valley & Lower Doane Valley	$5,000	$4,000	$3,000
	TOTAL:	**$1,368,000**	**$1,078,000**	**$828,000**

Notes: Totals may not add due to rounding.
* Future costs are allocated across subunits based on the percent of Federally-proposed critical habitat area in each subunit.

APPENDIX A | SMALL ENTITY AND ENERGY IMPACTS ANALYSIS

199. This appendix considers the extent to which the analytic results presented in the previous sections reflect potential future impacts to small entities and the energy industry. The screening analysis presented in this appendix is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) in 1996. Information for this analysis was gathered from the Small Business Administration (SBA), U.S. Census Bureau, and the Risk Management Association (RMA). The energy analysis in Section A.2 is conducted pursuant to Executive Order No. 13211.

A.1 SBREFA ANALYSIS

200. In accordance with SBREFA, when a Federal agency publishes a notice of rulemaking for any proposed or final rule, it must make available for public comments a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions). No regulatory flexibility analysis is required, however, 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.

201. To assist in this process, the following represents a screening level analysis of the potential for skipper conservation efforts to affect small entities. This analysis is based on the estimated impacts associated with the proposed rulemaking as described in Chapters 3 through 7 of this analysis.

202. This appendix first describes the governments and industries that may experience impacts due to skipper conservation efforts within the potential critical habitat. It then provides more detail on the specific type of impacts potentially affecting small entities.

A.1.1 IDENTIFICATION OF ACTIVITIES THAT MAY INVOLVE SMALL ENTITIES

203. This analysis estimates prospective economic impacts due to implementation of skipper conservation activities in six categories:

- Grazing activities;
- Recreational camping activities;
- Recreational hiking activities;
- Utility activities

- Rural development;
- Other activities on Federal lands; and
- Skipper management activities on State lands

204. Of these seven categories, impacts of skipper conservation are not anticipated to affect small entities in five of these categories: hiking, utilities, rural development, other activities on Federal lands, and management activities on State lands. Chapter 6 concludes that residential development is unlikely to be impacted by skipper conservation activities. As described in Chapters 5, 6, 7 and 8, the modifications to activities on Federal and State lands, including installation of signs, construction of recreation exclosures, and surveying and monitoring activities will be borne by the U.S. Forest Service (USFS), the State of California, and major utility companies. Neither Federal, State government or the major utilities (SDG&E and AT&T) are defined as small entities by the Small Business Administration (SBA), therefore, the economic impacts resulting from implementation of skipper conservation activities are not relevant to the screening analysis.

205. Accordingly, the small business analysis contained in this appendix focuses on economic impacts to grazing and recreational camping activities.

A.1.2 ANALYSIS OF IMPACTS TO SMALL BUSINESSES RELATED TO GRAZING

206. The proposed designation includes areas of USFS and private lands that are used for livestock grazing. On some Federal allotments that contain skipper habitat, meadow areas have been excluded from grazing, thus reducing the carrying capacity, or permitted AUMs, on those allotments. Historically, returns to cattle operations have been low throughout the West. In recent years, these returns have been lower due to the recent wildfires and droughts in California. As a result, any reductions in grazing effort for the skipper may affect the sustainability of ranching operations in these areas.

207. The analysis assumes that in the future, grazing efforts on proposed CHD areas will be reduced, or in the high-end estimate, eliminated on private land due to skipper concerns. Private ranchers could be affected either by reductions in federally permitted AUMs that they hold permits to, or by reductions on grazing efforts on private property to avoid adverse impacts on skipper habitat. As discussed in Chapter 3, expected reduction in AUMs is based on an examination of historic grazing levels, section 7 consultations, and discussions with range managers, wildlife biologist, and permittees. Based on this analysis, the high impact on grazing activities is estimated at an annual reduction of 1,979 AUMs, of which 1,363 are Federally permitted and 618 are private. The majority of these AUM reductions fall on two ranchers: one operating in Subunit 1A and another operating in Subunit 2A. Therefore, cumulatively over 20 years, two ranchers could be affected by total reductions in AUMs due to skipper conservation activities.

A.1.3 ANALYSIS OF IMPACTS TO SMALL BUSINESSES RELATED TO CAMPING

208. In Chapter 4, this analysis considers lower- and upper-bounds of potential economic impact on recreational camping activities. The lower-bound equals no economic impact.

209. In the upper-bound, economic impacts are estimated for recreational campers whose activities may be interrupted by skipper conservation activities resulting in a decrease in the number of camping trips. Camping trips may decrease by as much as 5,352 trips per year.

210. If fewer camping trips were to occur within proposed critical habitat areas, local establishments providing services to campers may be indirectly affected by skipper conservation activities. Decreased visitation may reduce the amount of money spent in the region across a variety of industries, including food and beverage stores, food service and drinking places, accommodations, transportation and rental services.

211. To determine the potential regional economic impacts of decreases in camping trips, this analysis uses regional economic modeling to quantify the dollar value of goods and services produced and employment generated by consumer expenditures. Regional economic modeling accounts for the interconnectedness of industries within a geographic area -- that is industries not only supply goods and services to consumers, but also to each other. Thus, spending in one economic sector tends to have a larger impact on the regional economy as a whole. This concept is commonly referred to as the "multiplier" effect.

212. In particular, this analysis utilizes a software package called IMPLAN to estimate the total economic effects of the reduction in economic activity in camping-related industries in the one county associated with skipper conservation activities, San Diego County. Commonly used by State and Federal agencies for policy planning and evaluation purposes, IMPLAN translates estimates of initial trip expenditures (e.g., food, lodging, and gas) into changes in demand for inputs to affected industries.[83] Changes in output and employment are calculated for all industries and then aggregated to determine the regional economic impact of reduced recreational camping-related expenditures potentially associated with skipper conservation activities.

213. Ideally, this analysis would develop and use a per-trip estimate of expenditures for camping based on the existing economics literature. However, no such data is available for camping activities. In the absence of this information, and in order to understand the magnitude of the potential impacts, this analysis uses the average expenditures reported by the 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation for California for fishing, hunting and wildlife-associated recreation, or approximately $26.23 per trip (Exhibit A-1).

83 The IMPLAN model is owned and maintained by the Minnesota IMPLAN Group, Inc. (MIG). For more information see: IMPLAN Professional, Social Accounting and Impact Analysis Software, User's Guide, Analysis Guide, Data Guide, Minnesota IMPLAN Group, Inc. 1997.

EXHIBIT A-1 RECREATION-RELATED EXPENDITURES PER TRIP ($2005)[1]

EXPENDITURE CATEGORY[2]	PER FISHING TRIP	PER HUNTING TRIP	PER WILDLIFE-RECREATION TRIP	AVERAGE
Food	$13.58	$16.11	$11.78	$13.82
Gas & Auto	$9.92	$12.92	$14.40	$12.41
TOTAL:	**$23.50**	**$29.03**	**$26.18**	**$26.23**

Notes:
1 Values adjusted using the GDP Implicit Price Deflator, Table 1.1.9. Implicit Price Deflators for Gross Domestic Product, U.S. Department of Commerce, Bureau of Economic Analysis. December 2005.
2 Expenditures were limited to the above categories because the majority of rock climbing trips (94 percent) are taken as day trips.

Source: U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

214. This per-trip estimate of expenditures is then combined with the number of camping trips potentially lost due to skipper conservation activities (a one-year loss of 5,352 trips per year) to estimate total expenditures of $140,000 due to recreational camping in proposed critical habitat areas. According to IMPLAN, these camping-related expenditures contribute approximately $249,000 per year to the regional economy, a result that is indiscernible if rounded to significant digits consistent with model data. When compared to the total output of the industry sectors directly impacted by these expenditures (e.g., groceries, restaurants, and gasoline stations) in the regional economy of San Diego County (or $6.8 billion), the potential loss generated by a decrease in camping trips is less than one hundredth of a percent.

215. It is important to note that the estimates of lost camping trips assume that the trips are not substituted to another location within San Diego County. In addition, the analysis assumes that recreators do not undertake substitute activities (e.g., climbers do not go hiking or biking instead of camping in proposed critical habitat areas). If recreators visit substitute sites or choose alternative activities, the regional impacts predicted in this section may be smaller or would not occur.

A.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

216. 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.[84]

[84] 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.

217. 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 (bbls);
- 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.[85]

As none of these criteria is relevant to this analysis, energy-related impacts associated with conservation efforts within the potential critical habitat are not expected.

[85] Ibid.

APPENDIX B | SUMMARY OF PAST IMPACTS TO ALL ACTIVITIES BY SUBUNIT

EXHIBIT B-1 PAST IMPACTS (1997 - 2005) TO ALL ACTIVITIES BY SUBUNIT

UNIT	SUBUNIT	UNDISCOUNTED		PRESENT VALUE, 3%		PRESENT VALUE, 7%	
		LOW	HIGH	LOW	HIGH	LOW	HIGH
1	A. Laguna Meadow	$1,192,000	$1,223,000	$1,327,000	$1,361,000	$1,530,000	$1,570,000
	B. Filaree Flat	$16,000	$19,000	$18,000	$22,000	$20,000	$25,000
	C. Agua Dulce Campground & Horse Meadow	$716,000	$719,000	$796,000	$798,000	$915,000	$918,000
2	A. Mendenhall Valley & Observatory Campground	$95,000	$107,000	$107,000	$120,000	$123,000	$137,000
	B. Upper French Valley, Observatory Trail, and Palomar Observatory Meadows	$31,000	$31,000	$35,000	$35,000	$40,000	$41,000
	C. Upper Doane Valley & Girl Scout Camp	$17,000	$17,000	$20,000	$20,000	$23,000	$23,000
	D. Lower French Valley & Lower Doane Valley	$7,000	$8,000	$8,000	$8,000	$10,000	$10,000
	TOTAL:	**$2,075,000**	**$2,124,000**	**$2,310,000**	**$2,364,000**	**$2,661,000**	**$2,723,000**

Note: Totals may not sum due to rounding.

APPENDIX C | WUI AREAS IN PROPOSED CRITICAL HABITAT

EXHIBIT C-1 WUI AREAS IN UNIT 2: PALOMAR MOUNTAIN

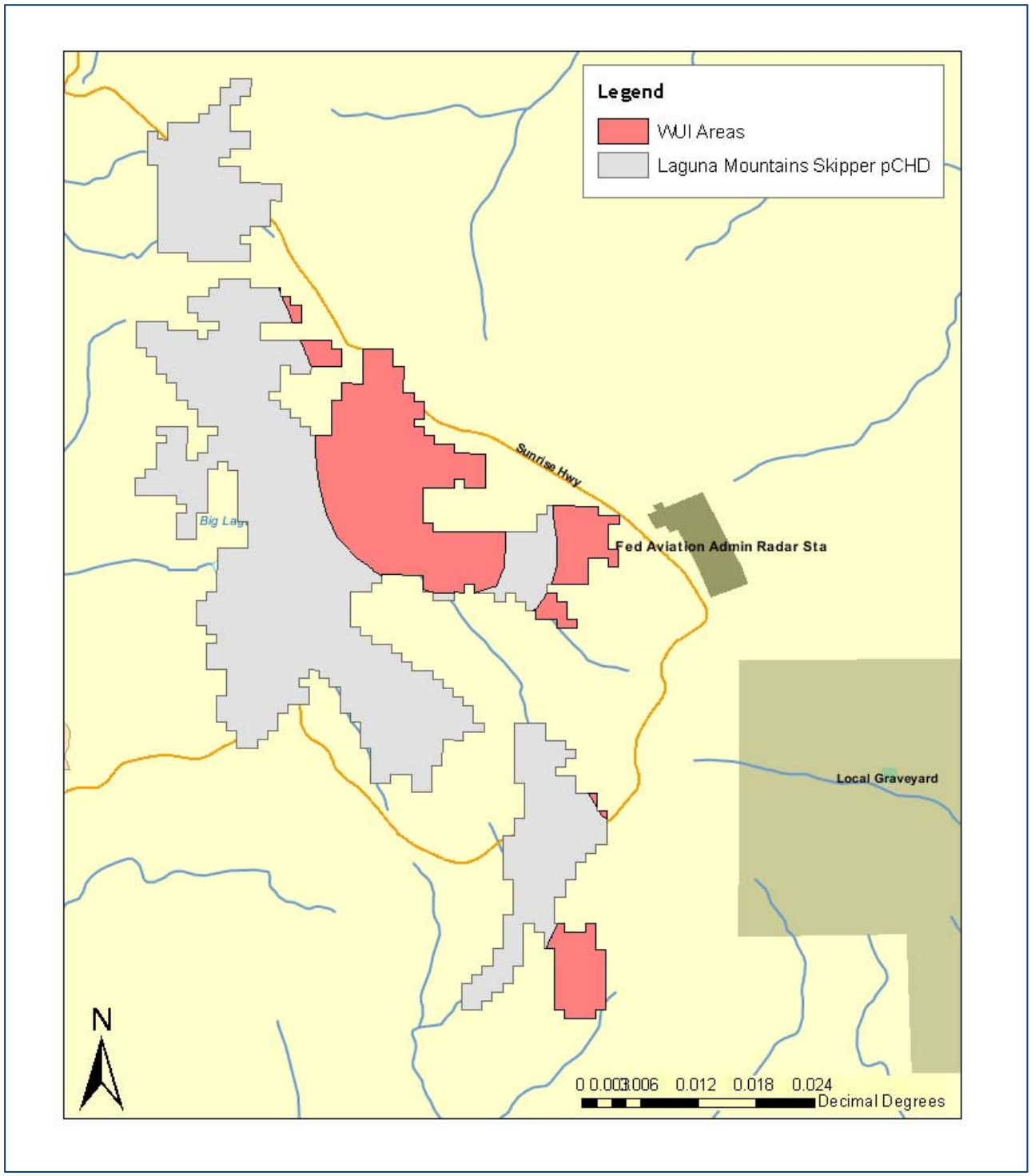
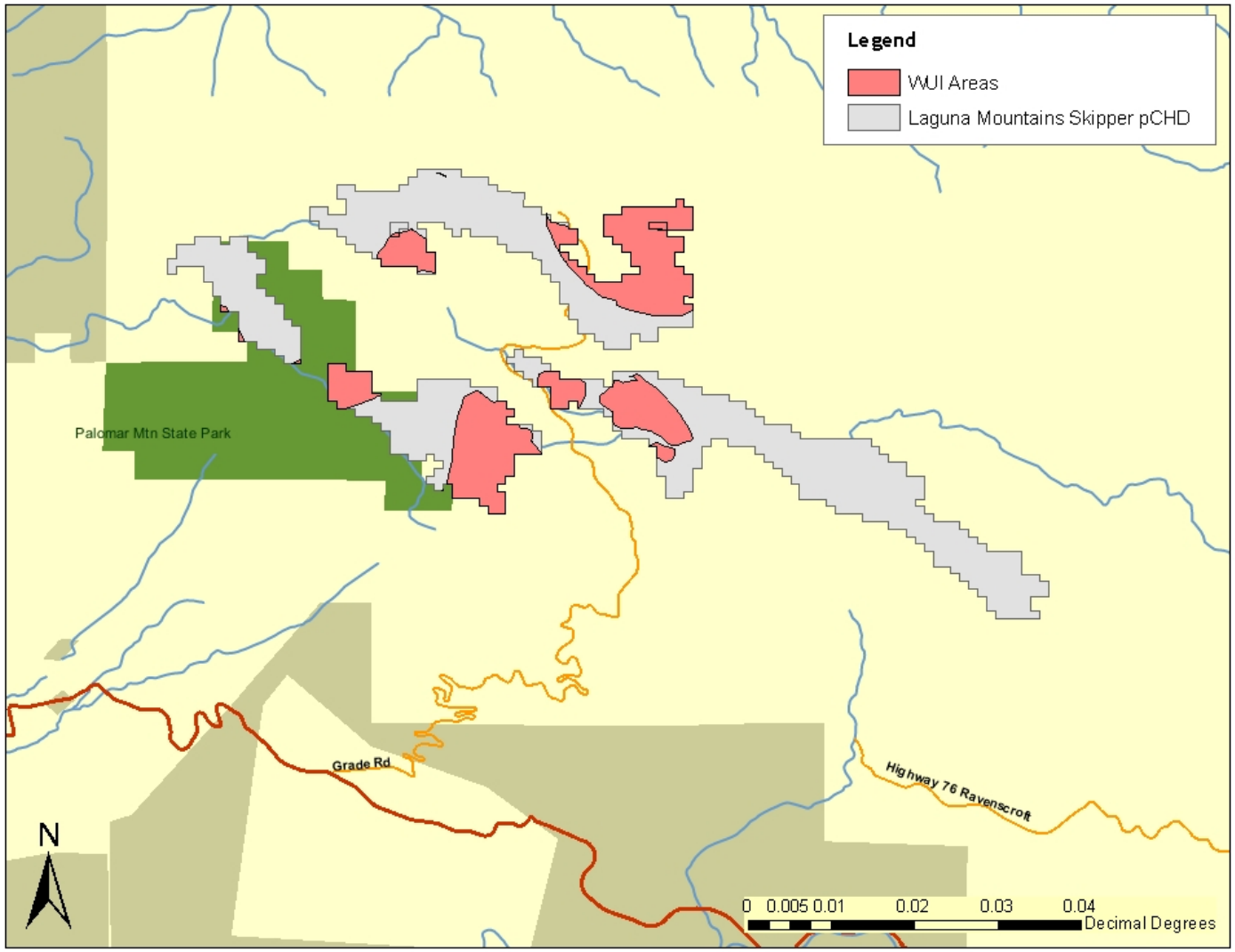


EXHIBIT C-2 WUI AREAS IN UNIT 2: PALOMAR MOUNTAIN



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