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Economic Analysis of Critical Habitat Designation for San Diego Thornmint

Prepared for:
U.S. Fish and Wildlife Service
Arlington, Virginia

Prepared by:
Northwest Economic Associates
A Division of ENTRIX, Inc.
Vancouver, Washington

October 19, 2007

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The purpose of this report is to identify and analyze the potential economic impacts associated with the proposed critical habitat designation for the Federally-listed *Acanthomintha ilicifolia* (San Diego thornmint, hereafter referred to as Thornmint or species).

On March 14, 2007, the U.S. Fish and Wildlife Service (Service) published a proposed critical habitat designation for the Thornmint.¹ In the proposed rule, the Service has identified 1,867 acres² in San Diego County, California that meet the definition of critical habitat for Thornmint. Of this number, the Service is considering excluding approximately 1,137 acres that are covered by five Habitat Conservation Plans (HCPs) from final critical habitat according to Section 4(b)(2) of the Endangered Species Act (Act), culminating in a proposed final designation of approximately 730 acres³ of U.S. Forest Service (USFS), County of San Diego, and private land. The economic impacts of the critical habitat designation are estimated separately for each of the two categories of land identified in the proposed rule: 1) areas proposed for final designation and 2) areas being considered for exclusion from final critical habitat according to Section 4(b)(2) of the Act (collectively referred to in this analysis as the “Study Area”).

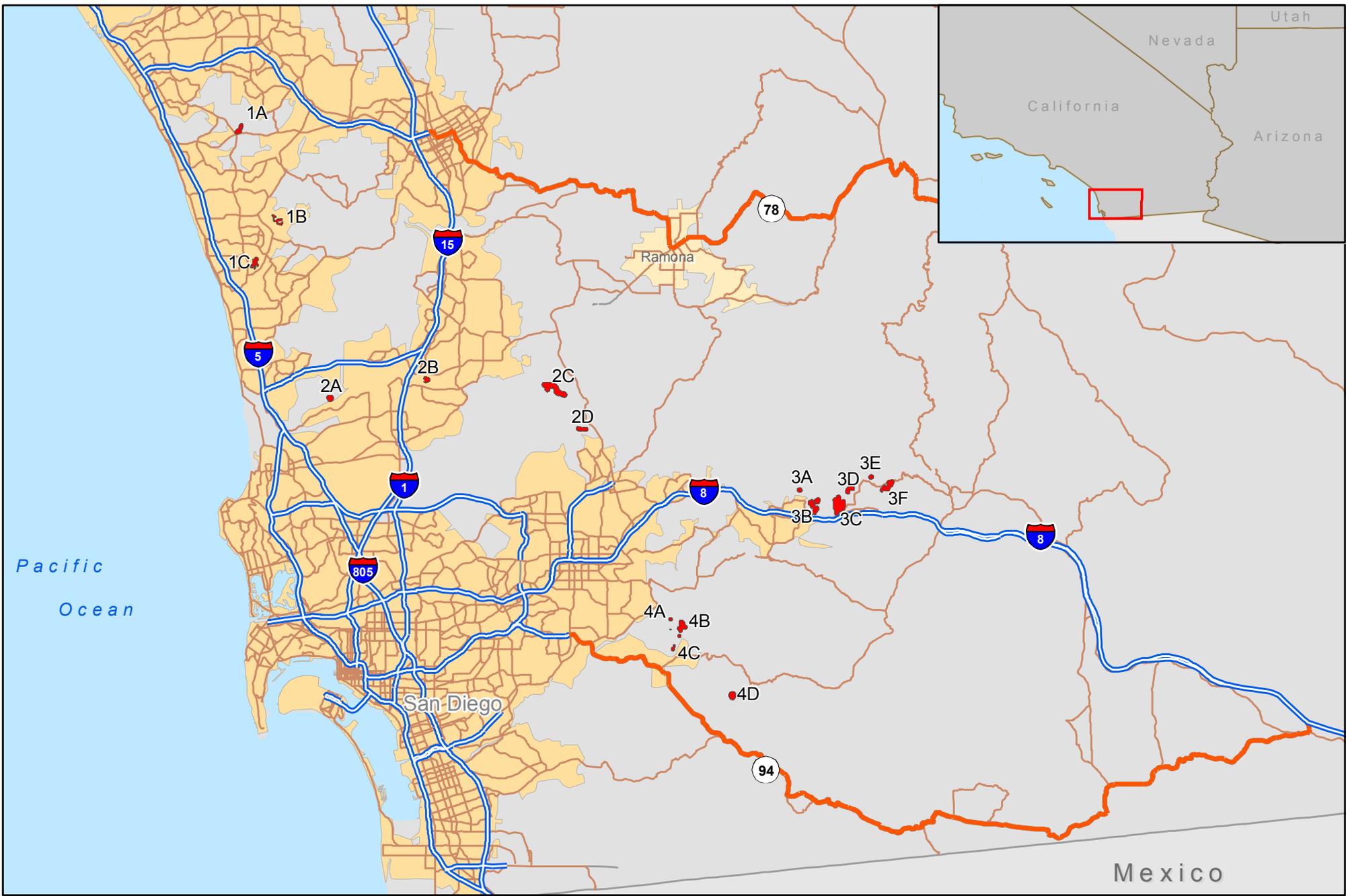
The Study Area of this analysis, therefore, comprises 1,867 acres of land in San Diego County, California. The Study Area consists of four units, which are further subdivided into 17 subunits. Figure ES-1 provides a map of the Study Area. The units are made up of a mix of Federal, state and local, non-governmental organization (NGO), and private lands. Of the Study Area acres, about 30 percent are Federal lands, approximately 29 percent are owned by state and local entities, almost 28 percent are privately-owned, and the remaining 14 percent belong to NGOs.

Figure ES-2 summarizes key findings of the economic analysis. Results are presented in greater detail later in this summary.

¹ Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for *Acanthomintha ilicifolia* (San Diego thornmint), *Federal Register*, Vol. 72, No. 49, pp. 11946-11988, March 14, 2007.

² This total may not correspond with acreage totals in the proposed rule due to an error in the rule regarding acreage for subunits 4A and 4B. This analysis, therefore, uses the correct acreage calculated from the GIS layer for the Study Area instead of that reported in the rule. Personal communication with U.S. Fish and Wildlife Service Botanist, Carlsbad Fish Wildlife Office, April 24, 2007.

³ The private lands in subunits 3C, 3D, and 3F were originally proposed for exclusion since these were perceived to be covered under the East County Multiple Species Conservation Program (East County MSCP). However, given that the MSCP is in its early stages of development and more recent information suggests that these private lands are not in the jurisdiction of the MSCP, all privately-owned lands in the three subunits are added to the final designation (see Appendix C for details).



■ Thornmint Study Area

0 2.5 5 10 Miles

ES-1
Acanthomintha ilicifolia
San Diego Thornmint Study Area





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ES.1 RESULTS OF THE ANALYSIS

Potential impacts are separated according to activity into three impact categories: impacts related to development, recreation, and exotic plant species management. Table ES-1 provides detailed pre- and post-designation impact information for all activities. Pre- and post-designation impacts are presented in undiscounted 2007 dollars. Post-designation impacts are also provided in present value and annualized terms using three and seven percent discount rates.

Figure ES-2 Key Findings⁴

Total impacts: Pre-designation (1998-2007) impacts associated with species conservation activities in areas proposed for final designation are estimated at \$53,000 in 2007 dollars. The draft economic analysis forecasts post-designation impacts in the proposed final designation areas at \$0.6 to \$2.8 million (undiscounted dollars) over the next 20 years. The present value of these impacts, applying a three percent discount rate, is \$0.4 to \$2.1 million (\$25,000 to \$137,000 annualized); or \$0.3 to \$1.5 million using a seven percent discount rate (\$25,000 to \$136,000 annualized).

Activities most impacted: Impacts associated with development, recreation, and exotic plant species management comprise all of the quantified impacts in the areas proposed for final designation. In summary:

- ◆ **Development:** Impacts associated with development represent the largest proportion of future impacts, accounting for 96 percent of forecast impacts in the areas being proposed for final designation. Future development impacts are estimated to range between \$0.3 and \$2.0 million (present value at three percent). Development-related impacts primarily consist of costs of land acquisition, management, biological monitoring, and program administration of land to be added to HCP preserve areas.
- ◆ **Recreation:** Impacts associated with recreation account for approximately four percent of forecast impacts. Future impacts are estimated at \$82,000. The amounts are driven by the potential management actions, such as use of signs, use of barriers such as fences and gates, patrolling, obliteration of trails, and outreach programs to control recreation within the habitat.
- ◆ **Exotic Plant Species Management:** Future exotic plant species management-related conservation impacts make up the remaining forecast impacts (less than one percent). These impacts are estimated at \$3,000, and are based on the costs of herbicide use, weeding, and monitoring as deemed necessary within the proposed designation.

Subunit impacts: Under the proposed final designation scenario, approximately 98 percent of the anticipated post-designation impacts are forecast to occur in subunits 3D (71 percent), 3C (17 percent), and 3F (11 percent). The remaining two percent of forecast impacts are expected to occur in subunits 3B, 1A, and 3E.

Distribution of impacts: State and Federal government agencies are expected to account for approximately 35 percent of the total anticipated future impacts in areas proposed for final designation; the County of San Diego is forecast to bear 34 percent of the impacts; private landowners/home owner's associations are expected to bear the remaining 31 percent; and the Center for Natural Lands Management (CNLM) is forecast to bear less than one percent of the impacts.

Areas proposed for exclusion according to Section 4(b)(2): Total pre-designation impacts in areas proposed for exclusion according to Section 4(b)(2) of the Act are forecast at \$3.2 million, and total undiscounted future impacts are forecast at \$1.6 to \$5.1 million. The present value impact implying a three percent discount rate is \$1.2 to \$3.7 million, or \$0.8 to \$2.6 million applying a seven percent discount rate. In annualized terms, potential impacts are expected to range from \$77,000 to \$253,000 (annualized at three percent) and \$72,000 to \$248,000 (annualized at seven percent). Development-related impacts represent the largest proportion of future impacts, accounting for 90 percent of forecast impacts in the areas being considered for exclusion from final designation. The remaining impacts are related to recreation management (nine percent) and exotic plant species management (less than one percent).

⁴ Throughout the report, detailed results, including graphical illustrations, are provided using upper-bound impacts and discounted using a three percent discount rate.

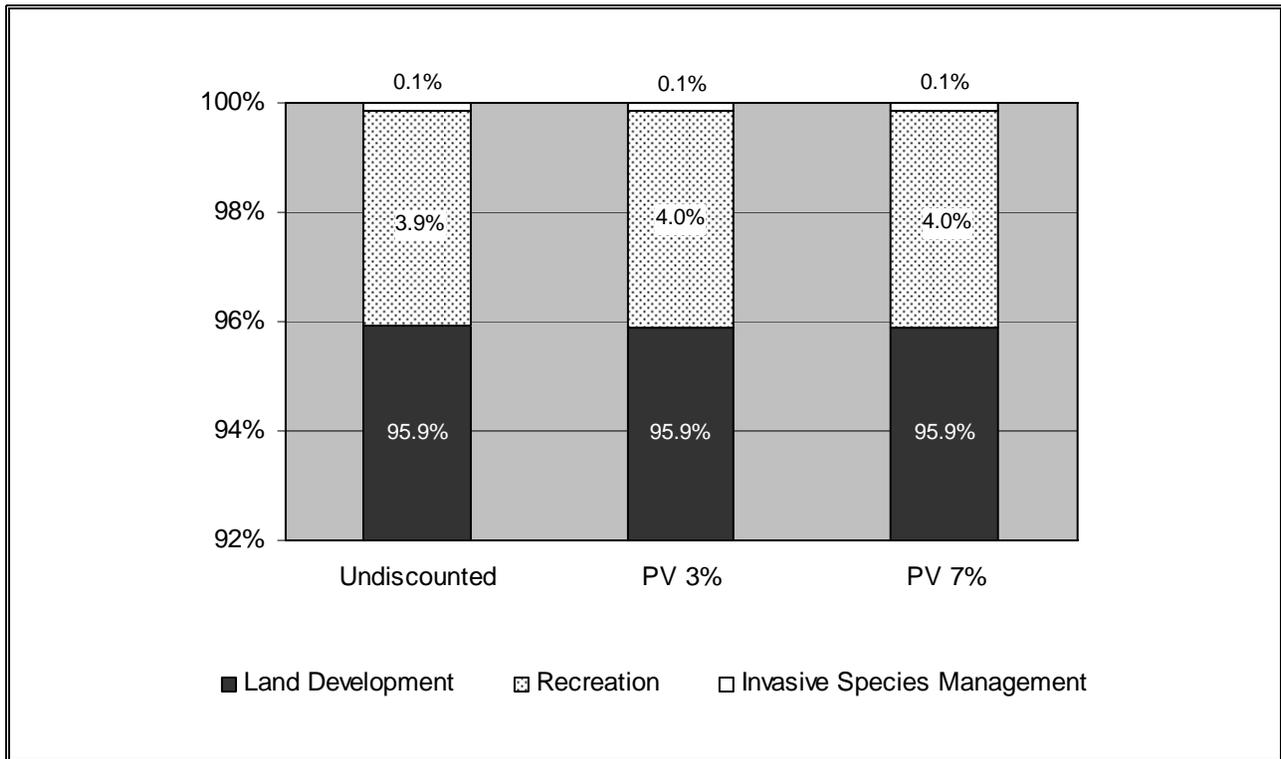
Figure ES-3 illustrates the proportion of expected future conservation impacts of affected activities using the upper-bound impact estimates. As shown, impacts related to development account for about 96 percent of anticipated impacts in areas proposed for final designation. The remaining impacts stem from recreation management (four percent) and from management of exotic plant species (less than one percent). Table F-1, located at the beginning of Appendix F, provides detailed total pre- and post-designation impact information on a subunit-by-subunit basis, while Tables F-2 to F-4 in the appendix present the same information for each activity. All post-designation impacts presented in this executive summary are based on upper-bound conservation impacts calculated at a three percent discount rate.

Table ES-1
Summary of Conservation Impacts, by Activity (\$1,000s of \$2007)

Activity	Pre-Designation (Total) (1998-2007)	Post-Designation (Total) (2008-2027)			Post-Designation (Annualized)	
		Undiscounted	3%	7%	3%	7%
Areas Proposed for Final Designation						
Land Development	\$0	\$451-\$2,670	\$326-\$1,977	\$224-\$1,399	\$21-\$133	\$21-\$132
Recreation	\$53	\$109	\$82	\$58	\$4	\$4
Exotic Plant Species Management	\$0	\$4	\$3	\$2	\$0	\$0
Total	\$53	\$564-\$2,783	\$411-\$2,062	\$284-\$1,459	\$25-\$137	\$25-\$136
Areas Being Considered for Exclusion from Final Critical Habitat						
Land Development	\$3,009	\$1,127-\$4,618	\$794-\$3,391	\$527-\$2,376	\$54-\$230	\$49-\$225
Recreation	\$191	\$426	\$319	\$228	\$21	\$21
Exotic Plant Species Management	\$23	\$52	\$39	\$28	\$2	\$2
Total	\$3,223	\$1,605-\$5,096	\$1,152-\$3,749	\$783-\$2,632	\$77-\$253	\$72-\$248

Note: Results are shown in \$1,000s. Numbers may not sum due to rounding.

**Figure ES-3
Relative Post-Designation Impacts by Affected Activity**



ES.1.1 Development

Many proposed critical habitat subunits are undeveloped and vacant areas near urban developments and are potential sites for future development. According to the proposed rule, urban development may alter the habitat characteristics required by the species. The destruction of habitat can change the slope and aspect of the site, making it uninhabitable for Thornmint.

Development may be affected by species conservation through HCPs that cover the Study Area. The Study Area is under the jurisdiction of two approved and one planned HCP, as well as three approved HCP subarea plans and one subarea plan that is under development. Under these plans, the majority of private land within the boundaries of the Study Area is located in the HCP preserve systems. Private lands within the preserve systems are subject to special restrictions on development and, as the lands are committed to the preserve area, must be legally protected and permanently managed to conserve the covered species. Thus, the costs of land acquisition, management, biological monitoring, and program administration for preserving the portions of private land within the Study Area that provide long-term conservation value for Thornmint are measured as the total economic impacts of critical habitat designation for the species.

Two private landowners and four parcels (58.5 affected acres) can potentially be impacted by the proposed final designation. One landowner owns three affected parcels, one in Subunit 3D (50.0 affected acres) and two parcels in Subunit 3F (6.8 affected acres), while the other landowner owns one affected

parcel in Subunit 3C (1.7 affected acres). Following the designation, approximately \$326,000 to \$2.0 million in post-designation development impacts are forecast. Approximately 74 percent of the potential post-designation development impacts are forecast to occur on private lands in Subunit 3D, 16 percent in Subunit 3C, and 10 percent in Subunit 3F. Based on the HCP funding structures outlined in Appendix C, most of the development impacts (36 percent) are expected to be borne by the County of San Diego, with 33 percent of the impacts being borne by state and Federal government agencies, and 32 percent by private landowners/home owner's associations.

ES.1.2 Recreation

The proposed rule identifies human recreation leading to species destruction and habitat degradation as one of the primary threats to Thornmint in all subunits. Recreational activities in the proposed designation that may harm the species and its habitat include hiking, OHV use, and mountain biking. Further, many subunits are undeveloped and vacant areas near urban developments, thus providing convenient venues for both authorized and unauthorized recreation.

The estimation of potential economic impacts associated with recreation management on public lands comprises the cost associated with managing authorized recreation and the cost of restricting unauthorized recreation. Potential management actions include use of signs, use of barriers such as fences and gates, patrolling, obliteration of trails, and outreach programs to control recreation within the habitat. In terms of welfare impacts, such as gained or lost trips, gained or lost user days from authorized recreation are not expected, while welfare impacts of gained or lost user days resulting from actions to restrict unauthorized recreation are not quantified in this analysis. Although, commencing in 2010, CNLM plans to allow running and hiking on 326 acres of land it manages in and around Subunit 1A, the annual number of expected visitors on this land is unknown and the value of recreational opportunities related to Thornmint conservation cannot be estimated in this report. Further, since only about six percent of the 326-acre area is located within the Study Area, most of the additional recreation opportunities are expected to occur outside the scope of this analysis.

The post-designation impacts of species conservation associated with recreation in the proposed final designation are estimated at approximately \$82,000. Approximately 91 percent of the potential post-designation recreation management impacts are forecast to occur on USFS lands in subunits 3C (37 percent), 3B (25 percent), 3F (21 percent), 3E (five percent), and 3D (four percent). The remaining nine percent of recreation-related impacts are expected to occur on County of San Diego lands in Subunit 1A.

ES.1.3 Exotic Plant Species Management

According to the proposed rule, the presence of exotic plants may harm the species and its habitat in all subunits. These invasive species, including *Cynara cardunculus L.* (Artichoke Thistle), *Centaurea melitensis* (Tocalote), and other exotic plants tend to compete with native species. The analysis of economic impacts related to exotic plant species management on public lands is based on the cost of weeding, herbicide use, and monitoring as deemed necessary to protect the Thornmint from the threat of

incursion and spread of exotic plant species identified in the proposed rule. When possible, only exotic species management actions specifically related to Thornmint conservation are quantified.

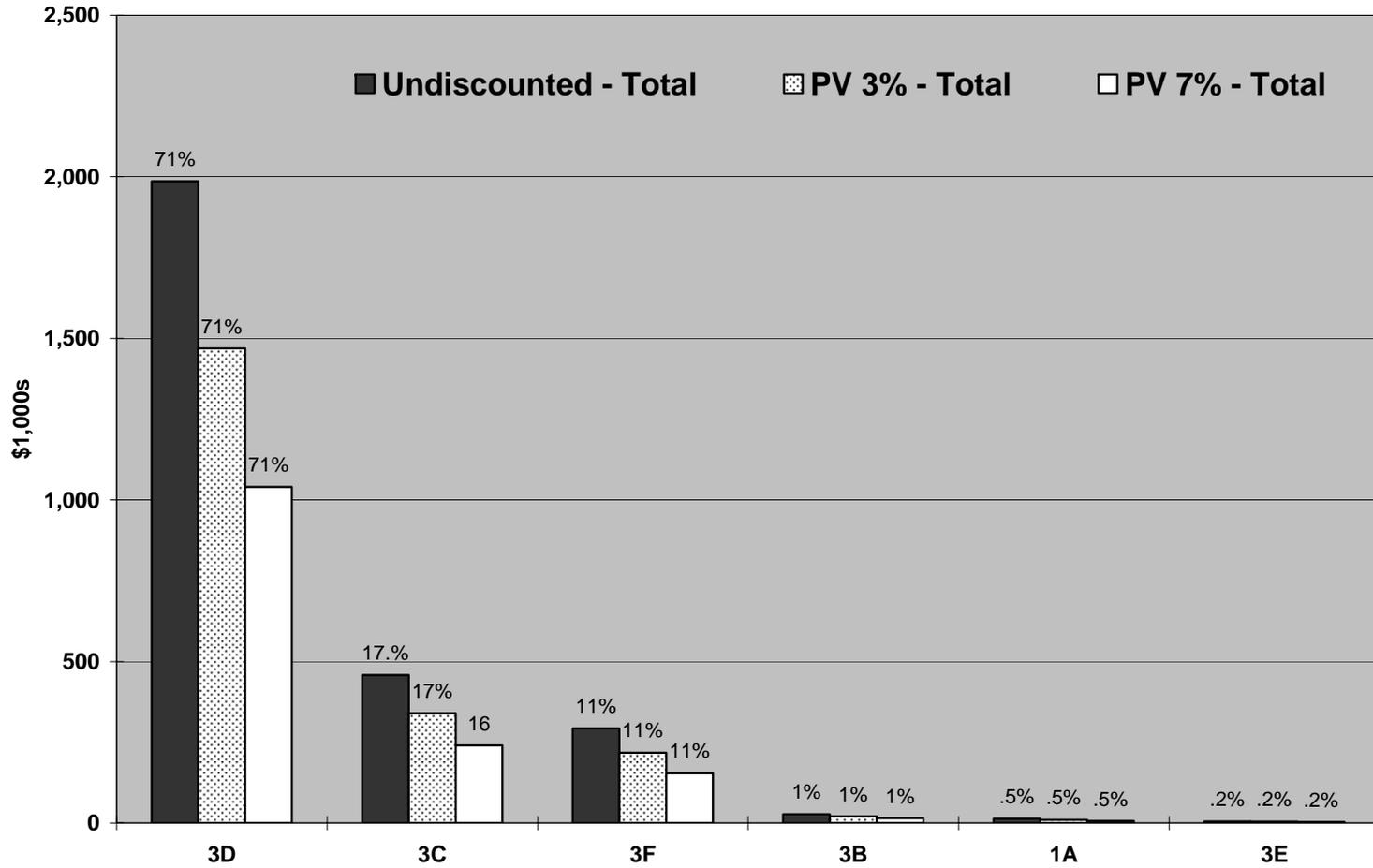
Following the designation, approximately \$3,000 in post-designation exotic plant species management impacts are forecast in the proposed final designation. All of these potential post-designation exotic plant species management impacts are forecast to occur in Subunit 1A, and the County of San Diego is expected to bear all of these impacts.

ES.1.4 Section 7 Consultations

Since the Federal listing of the species in 1998, two Biological Opinions (BOs) on applications to the U.S. Army Corps of Engineers (ACOE) to discharge fill material associated with developments near Thornmint habitat have occurred. The BOs suggest measures that will limit the impact of development activities to Thornmint and other sensitive species. Because none of the Section 7 consultations are related to the geographic location of the proposed designation, the economic analysis does not quantify the administrative impact associated with these historic Section 7 consultations.

In addition to the two historic consultations, one programmatic Section 7 consultation relevant to the species and involving the East County Multiple Species Conservation Program (MSCP) is anticipated in 2010. While the Thornmint will benefit from protective measures provided by the future East County MSCP, the development of the MSCP involves the evaluation of more than 250 species with no information available for allocating a portion of MSCP costs to Thornmint. Therefore, this analysis does not allocate the Section 7 consultation cost related to the East County MSCP to the Thornmint.

Figure ES-4
Economic Impacts of the Proposed Final Designation, by Habitat Subunit (\$1,000s)



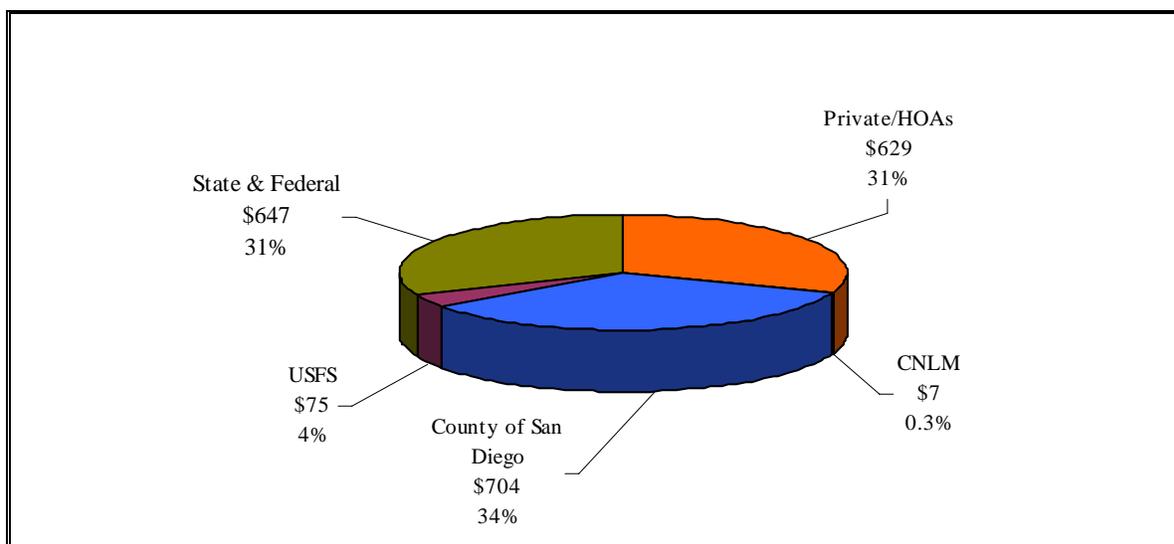
ES.2 AREAS MOST LIKELY TO EXPERIENCE IMPACTS

Figure ES-4 illustrates the ranking of proposed final designation subunits by impact. Tables providing detailed impact estimates are presented in Appendix F. As shown, only six subunits are impacted by the proposed final designation. Approximately 98 percent of these impacts are forecast to occur in three subunits, 3D, 3C, and 3F, while the remaining two percent are expected to occur in subunits 3B, 1A, and 3E. Impacts on privately-owned lands are related to development, impacts in the Cleveland National Forest (CNF) on USFS-managed lands are associated with recreation management, while impacts on County-owned lands stem from recreation and exotic plant species management.

ES.3 DISTRIBUTIONAL IMPACTS

Approximately 35 percent of the total expected post-designation impacts in areas proposed for final designation accrue to state and Federal government agencies (see Figure ES-5). The remaining impacts accrue to the County of San Diego (34 percent), private landowners/home owner's associations (31 percent), and CNLM (less than one percent).

Figure ES-5
Relative Impact by Affected Party (in \$1,000s)



This study also analyzes whether a particular group or economic sector is expected to bear an undue proportion of the impacts. Specifically, Appendix B describes potential impacts of the proposed designation to small entities.

The purpose of this report is to estimate the economic impact of actions taken to protect the Federally-listed *Acanthomintha ilicifolia* (San Diego thornmint, hereafter referred to as Thornmint or species), 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 impact of conservation-related measures that are likely to be associated with future economic activities that may adversely affect the habitat within the proposed boundaries. The analysis looks retrospectively at impacts incurred since the Thornmint was federally listed, and it attempts to predict future impacts likely to occur after the proposed critical habitat designation is finalized.

This information is intended to assist the Secretary of the Interior (Secretary) in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.⁵ 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).⁶ 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.⁷

This chapter first provides background information on the species and the proposed designation. Next, it describes the regulatory alternatives considered by the Service. Then, it describes the approach to estimating impacts and lays out the scope of the analysis. Information sources relied upon are summarized in the next section. The chapter concludes with a description of the organization of the remainder of this report.

1.1 BACKGROUND

On October 13, 1998, the Service published the final rule listing the Thornmint as threatened (hereinafter, referred to as “final listing”), about sixteen years after the species was listed as endangered by the state

⁵ 16 U.S.C. §1533(B)(2)

⁶ 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.

⁷ 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 the proposed 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)).

(1982).⁸ In the final listing, the Service determined that designation of critical habitat for the plant species was not prudent because the designation would not be beneficial to the conservation of the species. On August 10, 2004, the Center for Biological Diversity and the California Native Plant Society filed a lawsuit against the Service for failure to designate critical habitat for the species.⁹ The Service agreed to publish a proposed determination of critical habitat on or before February 28, 2007 and a final rule by February 28, 2008. The rule proposing critical habitat designation for the species (hereinafter, referred to as “proposed rule”) was published in the Federal Register on March 14, 2007.¹⁰ A recovery plan for the Thornmint has not yet been completed. For a description of the species and the primary constituent elements that are essential to the conservation of the species, refer to the proposed rule.

In the proposed rule, the Service has identified 1,867 acres¹¹ in San Diego County, California that meet the definition of critical habitat for Thornmint. Of this amount, the Service is considering excluding approximately 1,137 acres that are covered by the various Habitat Conservation Plans (HCPs) in the area, culminating in a proposed final designation of approximately 730 acres¹² of U.S. Forest Service (USFS), County of San Diego, and private land. In the remainder of this report, the entire 1,867 acres are referred to as the “Study Area”.

The Study Area is comprised of four units, which are subdivided into 17 subunits. The subunits are a mix of Federal (USFS and Service), state and local, non-governmental organization (NGO), and private lands, which account for approximately 30 percent, 29 percent, 14 percent, and 28 percent of the total area, respectively. Table 1-1 summarizes land ownership by subunit. For a map showing the location of each subunit, see Figure ES-1 in the Executive Summary.

⁸ Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for *Acanthomintha ilicifolia* (San Diego thornmint), *Federal Register*, Vol. 72, No. 49, p. 11948, March 14, 2007.

⁹ Ibid.

¹⁰ Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for *Acanthomintha ilicifolia* (San Diego thornmint), *Federal Register*, Vol. 72, No. 49, pp. 11946-11988, March 14, 2007.

¹¹ This total may not correspond with acreage totals in the proposed rule due to an error in the rule regarding acreage for subunits 4A and 4B. This analysis, therefore, uses the correct acreage calculated from the GIS layer for the Study Area instead of that reported in the rule. Personal communication with U.S. Fish and Wildlife Service Botanist, Carlsbad Fish Wildlife Office, April 24, 2007.

¹² The private lands in subunits 3C, 3D, and 3F were originally proposed for exclusion in the proposed rule since these were perceived to be under the jurisdiction of the County of San Diego subarea plan of the County of San Diego MSCP. However, these private lands are not under the jurisdiction of the MSCP, all privately-owned lands in the three subunits fall within the planned East County MSCP, which is not expected to be completed until 2010 (see Appendix C for details). Because these subunits are not under the jurisdiction of an approved HCP, the Service is revising the proposed designation to include the privately-owned land in subunits 3C, 3D, and 3F.

**Table 1-1
Summary of Land Ownership in the Study Area (acres)**

Sub-unit	Name	Private	Federal		State and Local				Non-Governmental Organization				Total ²		
		All	USFS	Service	State of CA	San Diego County	75% State – 25% County	City – San Diego	City – Poway	CNLM	SFTOA	TET		TNC	
Areas Proposed for Final Designation															
1A	Palomar Airport				81									81	
3B	Viejas Mountain		52											52	
3C	Viejas Mountain	38	280											318	
3D	Viejas Mountain	50	32											82	
3E	Poser Mountain		34											34	
3F	Poser Mountain	7	156											163	
Total ¹		95	554		81									730	
Percent Proposed for Final Designation		13.1%	75.8%		11.1%										
Areas Considered for Exclusion															
1A	Palomar Airport	7												7	
1B	Southeast Carlsbad	69								4				73	
1C	Manchester	20							72					92	
2A	Los Penasquitos Canyon							63						63	
2B	Sabre Springs	1					45		6					52	
2C	Sycamore Canyon	30			224		52							306	
2D	Slaughterhouse Canyon	77												77	
3A	Viejas Mountain	33												33	
3B	Viejas Mountain	156												156	
4A	McGinty Mountain	2		2							17			20	
4B	McGinty Mountain	2			7							62		78	
4C	McGinty Mountain	5			1								22		
4D	Hollenbeck Canyon	23			61									84	
Total ¹		423		3		68	224	52	107	6	72	4	79	99	1,137
Percent Considered for Exclusion		37.2		0.2%		6.0	19.7	4.6	9.4	0.5%	6.3	0.4	6.9	8.7	
Total Study Area															
Total ¹		519	554	3	68	305	52	107	6	72	4	79	99	1,867	
Percent of Study Area		27.8%	29.7%	0.1%	3.7%	16.3%	2.8%	5.7%	0.3%	3.8%	0.2%	4.2%	5.3%		

¹ This total may not correspond with acreage totals in the proposed rule due to an error in the rule regarding acreage for subunits 4A and 4B. This analysis, therefore, uses the correct acreage calculated from the GIS layer for the proposed designation instead of that reported in the rule. Personal communication with U.S. Fish and Wildlife Service Botanist, Carlsbad Fish Wildlife Office, April 24, 2007.

Acronyms used in Table 1-1: USFS – USDA Forest Service, CA – California, CNLM – Center for Natural Lands Management, SFTOA – Santa Fe Trails Owners Association, TET – The Environmental Trust, Inc., and TNC – The Nature Conservancy.

The primary threats to Thornmint in all subunits include the presence or spread of exotic plants and increased human recreation (e.g., hiking, off-road vehicle activity, mountain biking). Urban/residential development and its indirect affects are identified as threats to the species on privately-owned land within the Study Area. The final listing also identified mining activities as a potential threat to the species. However, the proposed rule does not identify mining as a threat in any unit. While Subunit 2D is adjacent to a sand and gravel mining operation, the Subunit is under a pre-listing open space easement and, thus, is already conserved.

1.2 REGULATORY ALTERNATIVES

Executive Order 12866 directs Federal Agencies to evaluate regulatory alternatives. The Service identifies four units, subdivided into 17 subunits, or areas that meet the definition of critical habitat within the Study Area, and proposes portions of six of the subunits for designation as final critical habitat. An alternative to the proposed rule is the designation of all 17 subunits, and the potential impacts of all these subunits are estimated in this report. In addition, Section 4(b)(2) of the Endangered Species Act (Act) allows the Service to exclude additional areas proposed for designation based on economic impact and other relevant impact if the Service determines that the benefits of exclusion outweigh the benefits of inclusion unless the exclusion would result in extinction of the species. Consideration of impacts at a subunit level may result in alternate combinations of proposed habitat that may or may not ultimately be designated as critical habitat. As a result, the impacts of multiple combinations of proposed habitat are also available to the Service.

1.3 APPROACH TO ESTIMATING ECONOMIC IMPACTS

This economic analysis considers economic efficiency effects that may result from activities to protect the Thornmint and its habitat (hereinafter, referred to collectively as “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 required conservation activities.

1.3.1 EFFICIENCY EFFECTS

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 Thornmint 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.¹³

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 USFS, may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost; because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets - that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded, given a change in price - the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.

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.

This analysis begins by measuring impacts associated with measures taken to protect the Thornmint 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. For this analysis, compliance costs are estimated. Market effects are unlikely because the costs of this proposed regulation (i.e., the areas proposed for final designation) are relatively small.

1.3.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

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.¹⁴ 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

¹³ 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>.

¹⁴ U.S. Office of Management and Budget, "Circular A-4," <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>, accessed September 17, 2003.

fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

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

This analysis also considers how small entities, including small businesses, organizations, and governments, as defined by the RFA, might be affected by future conservation activities for the Thornmint.¹⁵ 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.¹⁶

1.3.2.2 Regional Economic Effects

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

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.

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

¹⁵ 5 U.S.C. § 601 *et seq.*

¹⁶ Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

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. A regional economic analysis was not performed in this study because the costs of this proposed regulation (i.e., the areas proposed for final designation) are relatively small.

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 species 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 species conservation efforts from year t to T is measured in 2007 dollars according to the following standard formula:^a

$$PV_c = \sum_t^T \frac{C_t}{(1+r)^{t-2007}}$$

C_t = Cost of species 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, 2008 through 2027. Annualized impacts of future species 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 1998 and T is 2007; to derive the present value of future conservation efforts, t is 2008 and T is 2027.

^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.)

1.4 SCOPE OF THE ANALYSIS

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, or adjacent to, the Study Area. 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 Section 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.^{17,18}

Co-extensive 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 critical habitat designation efforts, the impacts of these actions are considered relevant for understanding the full effect of conservation efforts and the proposed critical habitat designation. Enforcement actions taken in response to violations of the Act, however, are not included.

This is important as Thornmint conservation pre-dates the Federal listing (October 1998) by over sixteen years following the state listing of the Thornmint as endangered (January 1982) under the California Endangered Species Act (CESA).¹⁹ The CESA is administered by the California Department of Fish and Game (CDFG). CDFG also informally consults with and provides guidance to entities, including state agencies, regarding the effects of their actions on state-listed species. In contrast to the Act, CESA prohibits take of plants and, in granting permits for take of plants, CESA requires “minimization and full mitigation” of impacts.²⁰ Thus, CESA offers additional protection to California’s state-listed species

¹⁷ 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 the proposed designation, 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)).

¹⁸ Issued in 2004, a Ninth Circuit judicial opinion invalidated the Service’s regulation defining destruction or adverse modification of critical habitat (*Gifford Pinchot Task Force v. USFWS*), and the Service does not rely on the regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat. Pursuant to the statutory provisions of the Act, destruction or adverse modification is determined on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional (or retain the current ability for the primary constituent elements to be functionally established) to serve its intended conservation role for the species.

¹⁹ State of California, The Resources Agency, Department of Fish and Game, Resource Management and Planning Division, Biogeographic Data Branch, California Natural Diversity Database, April 2007, “State and Federally Listed Endangered, Threatened, and Rare Plants of California,” http://www.dfg.ca.gov/hcpb/species/t_e_spp/teplant/teplanta.shtml, accessed May 24, 2007.

²⁰ Fish and Game Code, Section 2081(b) and California Code of Regulations, Title 14.

through take prohibition for plants. Species may be listed as threatened or endangered under both the Act and CESA or under only one of the acts.²¹

As the broadest environmental law in California, the California Environmental Quality Act (CEQA) also offers protection to state-listed species by providing guidance to state and local agencies for issuance of permits and approval of projects. The CEQA is a California State statute that requires state and local agencies (known as “lead agencies”) to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. Projects carried out by Federal agencies are not subject to CEQA provisions. The CEQA instructs the lead agency to examine impacts from a broad perspective, taking into account the value of species’ habitat that may be impacted by a project in an Environmental Impact Report (EIR). As the basis for all environmental reviews in the state, CEQA is the foundation for CESA.

If CDFG²² determines that a state-listed species could be impacted by the proposed project, the CEQA EIR’s biological component is required to discuss and evaluate habitat impacts, as well as present project alternatives. The CEQA lead agency can only approve a project if these alternatives are implemented, unless it finds that the project’s benefits clearly outweigh the costs, reasonable mitigation measures are adopted, there has been no “irreversible or irretrievable” commitment of resources made in the interim, and the resulting project would not result in the extinction of the species. Further, in such cases the lead agency typically requires project applicants to demonstrate that they have acquired “incidental take” permits from CDFG and/or USFWS (if it is a Federally-listed animal species) prior to allowing/permitting impacts to such species.²³ Thus, while the lead agency can approve the CEQA document, the project will not be able to proceed further without the issuance of an incidental take permit by CDFG under CESA.²⁴

²¹ Personal communication with Jennifer Deleon, Habitat Conservation Planning Branch, California Department of Fish and Game, July 17, 2007.

²² When a state-listed species is present in a proposed project’s area of impact, the CDFG usually assumes the role of a “Responsible Agency”. A Responsible Agency is an agency other than the lead agency that has a legal responsibility for also carrying out or approving a project. It must actively participate in the lead agency’s CEQA process, review the lead agency’s CEQA document and use that document when making a decision on the project. California Department of Fish and Game, Habitat Conservation Planning Branch, Environmental Review and Species Take Permits, http://www.dfg.ca.gov/hcpb/ceqacesa/ceqa/dept_role.shtml, accessed July 17, 2007.

²³ However, if a project is planned in an area where a “fully protected” species or “specified bird” (as per the Fish and Game Code) occurs, the project has to be designed to avoid all take as defined under applicable state law.

²⁴ For species that are listed under both the Act and CESA, Assembly Bill 21 (Fish and Game Code §2080.1) allows an applicant who has obtained a non-jeopardy” Federal Biological Opinion pursuant to Section 7, or who has received a Federal 10(a) permit (Federal incidental take permit), to submit the Federal opinion or permit to CDFG for a determination as to whether the Federal document is “consistent” with CESA. The applicant is required to consult with CDFG and to apply for state permit under CESA only if CDFG determines that the Federal incidental take permit is NOT consistent with state law. Contra Costa County, February 2002, “Proposed Alamo YMCA, Draft Environmental Impact Report – Appendix F,” <http://www.co.contra-costs.ca.us/depart/cd/current/County/appendixf.pdf>, accessed July 17, 2007.

In many such instances, the lead agency will require the project proponent to obtain all necessary permits from CDFG and any other state or Federal agency with jurisdiction over regulated resources as conditions of project approval.²⁵

The critical habitat designation under the Act may or may not trigger supplemental or subsequent environmental review under CEQA. If the designation or modification of critical habitat would trigger any of the findings under Section 21166 of CEQA (Public Resources Code) and Section 15162 of the Guidelines (California Code of Regulations, then subsequent or supplemental review may be required.²⁶ ²⁷ Given CDFG's authority under CEQA and CESA, while it is improbable that CDFG would authorize an action that would jeopardize the state endangered Thornmint, the impacts of these actions, and other local conservation efforts, are considered relevant for understanding the full effect of conservation efforts and the proposed designation. To the extent that the Thornmint critical habitat designation might trigger the completion of an EIR under CEQA, the associated costs are included in this economic analysis.

1.4.1 SECTIONS OF THE ACT RELEVANT TO THE ANALYSIS

This analysis focuses on activities that are influenced by the Service through sections 4, 7, and 10 of the Act.

- Section 4 of the Act focuses on the listing and recovery of endangered and threatened species, as well as critical habitat designation. 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.”²⁸ 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.”²⁹
- 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

²⁵ Personal communication with Jennifer Deleon, Habitat Conservation Planning Branch, California Department of Fish and Game, July 17, 2007.

²⁶ California Environmental Quality Act, Public Resources Code, Section 21166, “Subsequent or Supplemental Impact Report; Conditions,” and California Code of Regulations, Section 15162, “Subsequent EIRs and Negative Declarations.”

²⁷ Personal communication with Jennifer Deleon, Habitat Conservation Planning Branch, California Department of Fish and Game, July 17, 2007.

²⁸ 16 U.S.C. 1533.

²⁹ Ibid.

endangered or threatened species or result in the destruction or adverse modification of critical habitat.³⁰

- 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.”³¹
- Under Section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop a 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.³²

The Act does not prohibit “take” of endangered plants, although it prohibits the removal and reduction to possession and other specified actions with regard to endangered plants in areas under federal jurisdiction and prohibits similar actions in other areas in violation of state law (by regulation these prohibitions have been extended to threatened plants). Therefore, on private lands, unless a Federal nexus is present (e.g., a landowner requires a permit from a Federal agency to undertake an activity and, therefore, that agency is subject to consultation with the Service under Section 7 of the Act), private landowners are not obligated by the Service to take actions to avoid jeopardy to, or manage or minimize their impact on plants located on their property. As a result, this analysis does not estimate the cost of potential conservation efforts voluntarily undertaken by private landowners on private lands.

1.4.2 OTHER RELEVANT PROTECTION EFFORTS

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.³³ For the purpose of this analysis, such protective efforts are considered to be co-extensive with the protection

³⁰ The Service notes that the Ninth Circuit judicial opinion, *Gifford Pinchot Task Force v. USFWS*, invalidated the Service’s regulation defining destruction or adverse modification of critical habitat, and the Service does not rely on the regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat. Pursuant to the statutory provisions of the Act, destruction or adverse modification is determined on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional (or retain the current ability for the primary constituent elements to be functionally established) to serve its intended conservation role for the species.

³¹ 16 U.S.C. 1532.

³² U.S. Fish and Wildlife Service, “Endangered Species and Habitat Conservation Planning,” <http://endangered.fws.gov/hcp/>, accessed August 6, 2002.

³³ 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.

offered by critical habitat, and costs associated with these efforts are included in this report. In addition, under certain circumstances, the critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other state or local laws. In cases where these costs would not have been triggered absent the designation of critical habitat, they are included in this economic analysis.

1.4.3 ADDITIONAL ANALYTIC CONSIDERATIONS

This analysis also considers the potential for other types of economic impacts that can be related to Section 7 consultations in general and critical habitat designation in particular, including time delay, regulatory uncertainty, and stigma impacts.

1.4.3.1 Time Delay and Regulatory Uncertainty Impacts

Time delay impacts are costs resulting from project delays associated with the consultation process or compliance with other regulations. Regulatory uncertainty costs occur in anticipation of having to modify project parameters (e.g., retaining outside experts or legal counsel to better understand responsibilities with regard to critical habitat). Time delays and regulatory uncertainty impacts are not anticipated in this case, because the Federal agencies involved in consultations are familiar with the process.

1.4.3.2 Stigma Impacts

Stigma refers to the change in economic value of a particular project or activity due to negative (or positive) perceptions of the role critical habitat will play in developing, implementing, or conducting that policy. For example, changes to private property values associated with public attitudes about the limits and costs of implementing a project in critical habitat are known as “stigma” impacts. Stigma effects are a form of uncertainty that relate more to perceived fluctuations rather than observation, when there is limited information on actual outcomes. There is currently a void of peer-reviewed literature that has successfully identified or attempted to quantify empirical estimates of stigma effects. While stigma impacts are possible in locations where critical habitat is designated, the analysis does not anticipate stigma impacts related to species conservation activities.

1.4.4 BENEFITS

Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.³⁴ OMB’s Circular A-4 distinguishes two types of economic benefits: *direct benefits and ancillary benefits*. Ancillary benefits are defined as favorable

³⁴ Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993.

impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.³⁵

In the context of the critical habitat designation, 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.³⁶ *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.*

Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.

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. 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. Ancillary benefits that affect markets are not anticipated in this case and, therefore, are not quantified.

1.4.5 GEOGRAPHIC SCOPE OF THE ANALYSIS

The geographic scope of the analysis includes areas proposed for final critical habitat designation, as well as areas being considered for exclusion from the final designation under section 4(b)(2) of the Act, collectively referred to as the "Study Area" for the purposes of this analysis. The economic impacts of the critical habitat designation are estimated for each of these two categories of land identified in the proposed rule. The analysis quantifies impacts to land use activities within or affecting the entire Study

³⁵ U.S. Office of Management and Budget, "Circular A-4," <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>, accessed September 17, 2003.

³⁶ Ibid.

Area, but focuses on the areas proposed for final designation. The impacts are presented at the lowest level of resolution feasible, given available data, and are reported for each subunit identified in the proposed rule. The Executive Summary presents a map showing the location of the subunits (see Figure ES-1).

1.4.6 ANALYTIC TIME FRAME

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 development, recreation, and exotic plant species management activities from 1998 (year of the species’ final listing) to 2027 (20 years from critical habitat designation, anticipated in 2008). Forecasts of economic conditions and other factors beyond the next 20 years would be speculative.

1.5 INFORMATION SOURCES

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, NGOs, state, and local agencies. Specifically, the analysis relies on data collected in communication with personnel from the following entities:

- California Department of Fish and Game (CDFG);
- City of Carlsbad;
- City of Encinitas;
- City of Poway;
- City of San Diego;
- County of San Diego, Department of Parks and Recreation;
- County of San Diego, Department of Planning and Land Use;
- County of San Diego, General Services Department;
- Friends of Goodan Ranch and California Native Plant Society;
- Technology Associates International;
- The Center for Natural Lands Management (CNLM);
- The Nature Conservancy (TNC);
- U.S. Fish and Wildlife Service (Service);
- U.S. Forest Service (USFS); and
- Viejas Hills Partners, LLC.

In addition, this analysis relies upon the Service's Section 7 consultation records, public comments, and published journal sources.

1.6 STRUCTURE OF THE REPORT

The remainder of this report is organized as follows:

- Chapter 2: Potential Economic Impacts to Development;
- Chapter 3: Potential Economic Impacts to Recreation;
- Chapter 4: Potential Economic Impacts to Exotic Plant Species Management;
- Chapter 5: References;
- Appendix A: Administrative Costs;
- Appendix B: Small Business Analysis and Energy Impact Analysis;
- Appendix C: Habitat Conservation Plans;
- Appendix D: Detailed Maps of Current Land Ownership within Proposed Designation;
- Appendix E: Detailed Maps of HCP Hardline Conservation Areas; and
- Appendix F: Summary Results at Seven Percent, Three Percent, and Undiscounted.

According to the proposed rule, “[u]rban development near *Acanthomintha ilicifolia* populations may alter the habitat characteristics required by the species. The destruction of habitat can change the slope and aspect of the site, making it uninhabitable for *A. ilicifolia* (PCE).”³⁷ One of the major economic impacts to development resulting from the protection of habitat for an endangered species is the change in potential land use in critical habitat areas. The change in land use could be achieved through direct land use regulations or through public land acquisition. In the case of direct land use regulations, landowners and developers typically bear most of the impacts associated with the critical habitat designation. When there is a land acquisition, the acquisition costs represent the major economic impacts of the critical habitat designation. Depending on the funding sources for land acquisition, part of the impacts may accrue to landowners, developers, or be passed on by the developers to home buyers, while the rest may become a taxpayers’ encumbrance.

This chapter describes the past and expected future economic impacts to development within the Study Area. Specifically, this analysis estimates the direct and indirect economic impacts on development due to conservation activities for Thornmint. The chapter is divided into six sections. The first provides an overview of anticipated development opportunity on lands within the Study Area, and a general discussion on how development may be affected by species conservation through HCPs that cover the Study Area. Next is a description of species conservation activities, and a discussion of the methods and data used to estimate the economic impacts that may stem from such measures. This is followed by a discussion of past and future economic impacts to development in the area. Then, a brief summary of impacts is presented. The final section identifies and discusses caveats to the economic analysis.

2.1 BACKGROUND

The Study Area is located within the County of San Diego, California, and is affected by two approved and one planned Habitat Conservation Plans (HCPs). These include the approved South County Multiple Species Conservation Program (MSCP) and the Multiple Habitat Conservation Program (MHCP) (South County MSCP), and the contemplated East County MSCP. The two completed plans, as well as the one contemplated plan, are expected to serve as “umbrella documents” that guide local jurisdictions in creating subarea plans for preserve design, habitat and species criteria, and management and monitoring criteria. The Study Area is also located within the jurisdictions of three approved subarea plans: the City of San Diego MSCP Subarea Plan, the County of San Diego MSCP Subarea Plan, and the City of Carlsbad Habitat Management Plan (HMP) under the MHCP, and one subarea plan under development –

³⁷ Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for *Acanthomintha ilicifolia* (San Diego thornmint), Federal Register, Vol. 72, No. 49, p. 11952, March 14, 2007.

the City of Encinitas Subarea Plan under the MHCP (see Figure C-1 in Appendix C).³⁸ The three HCPs and four subarea plans are collectively referred to as “HCPs” in the remainder of this document.

The HCPs are designed to preserve habitat for multiple species, including the Thornmint, rather than focusing conservation efforts on one species at a time. This is accomplished by identifying areas for development and those for preservation and conservation (Focused Planning Areas, Multi-Habitat Planning Areas, Existing and Proposed Hardline Areas, and Standards Areas) to achieve a balance between growth and species protection. Development will be limited within the preservation areas in order to protect the species covered by the HCPs. A general description of the HCPs, Thornmint-related conservation goals and objectives, and Thornmint-related conservation costs in these plans is presented in Appendix C of this report.

As summarized in Table 1-1, the Study Area is comprised of 1,867 acres that meet the definition of critical habitat for Thornmint, of which 28 percent is private land owned by individual landowners, 14 percent belongs to conservation agencies (TNC, The Environmental Trust, Inc. (TET),³⁹ CNLM, and Santa Fe Trails Owners Association), 29 percent is the property of local and state governments, and 30 percent is owned by the Federal government (primarily USFS). All but 176 acres of the non-Federal land fall within the jurisdiction of an approved HCP, and 95 of the 176 acres not covered by an approved HCP (in subunits 3C, 3D, and 3E) are expected to be covered by the East County MSCP by 2010. Development activities on the private and local government lands will be limited under the HCPs to protect the species.

The affected private land in the Study Area totals approximately 519 acres (95 acres in the areas proposed for final designation, which are expected to be covered by the East County MSCP by 2010, and 423 acres in the areas being considered for exclusion); however, only 158 acres within 18 privately-owned parcels in the Study Area are available for development. The rest of the private acres are either developed (55 acres), being developed (35 acres) and not available for inclusion into an HCP preserve area, already included as part of an HCP preserve area (191 acres), or conserved in a pre-listing easement and located outside an HCP’s jurisdiction (77 acres). The cities of San Diego and Poway also own five undeveloped acres within two parcels.

Current zoning laws limit the type of development that may take place on the undeveloped private and city lands. All but two of the 20 affected privately- and city-owned undeveloped parcels within the Study

³⁸ As of the writing of this report, the Service has yet to receive a formal application for an incidental take permit from the City of Encinitas or to approve the City’s proposed subarea plan, while the East County MSCP is only in its early stages of planning (estimated to be in effect by 2010). Personal communications with David de Cordova, Principal Planner, City of Encinitas, May 2, 2007, and Thomas Oberbauer, Chief, MSCP Division, Department of Planning and Land Use, County of San Diego, May 14, 2007.

³⁹ With the bankruptcy of TET in 2005, the Service agreed to acquire the TET lands and add them to the San Diego National Wildlife Refuge; the acquisition is expected to take place by the end of 2007. Personal communication with Real Estate Specialist, Service, April 25, 2007.

Area are zoned as non-irrigated agriculture rural, agriculture preserve, rural residential, or part of the San Diego County Forest Conservation Initiative.⁴⁰ Under this zoning, development is limited, with the allowed density ranging from one single family home per one to 40 acres.⁴¹ The remaining two parcels are zoned as industrial, and the minimum parcel size is one acre. The present zoning would allow for no more than 21 single family homes and three one-acre industrial parcels within the Study Area.

2.2 OVERVIEW OF APPROACH TO ESTIMATING IMPACTS

According to the proposed rule, the approved Carlsbad HMP and County of San Diego subarea plans provide adequate management and protection for Thornmint in the Study Area. While the Encinitas subarea plan is not in effect and the East County MSCP is not in existence at the time of this report, the results of the analysis assume that these plans will be finalized and approved during the 20 year timeframe of the analysis and therefore will also provide adequate management and protection for the plant in the future. Under these plans, the majority of private land within the boundaries of the Study Area is located in the HCP preserve systems (Focused Planning Areas, Multi-Habitat Planning Areas, Existing and Proposed Hardline Areas, and Standards Areas). Private lands within the preserve systems are subject to special restrictions on development and, as the lands are committed to the preserve area, must be legally protected and permanently managed to conserve the covered species. Private lands located outside these preserve systems will be protected using a process that requires avoidance to the maximum extent feasible, or allows for a maximum certain percent encroachment into a species population if total avoidance is not feasible. Thus, the costs of land acquisition, management, biological monitoring, and program administration for preserving the portions of private land within the Study Area that provide long-term conservation value for Thornmint are measured as the total economic impacts of critical habitat designation for the species. The share of total costs that will be accrued to private landowners, developers, and Federal, state, and local governments (i.e., taxpayers) are also estimated based on the funding sources for land acquisition, management, biological monitoring, and program administration for the HCPs. The estimation procedure involves several steps, each of which is described below.

The first step in the estimation process involves estimating the portion of private and public land that will be impacted by the HCPs. Local government-owned lands are included as “private land” in this analysis as these lands have been, or will be, added to the HCP conservation areas and managed with the private lands added to the preserve area. For private land, the estimation considers a) whether the parcel is developed or undeveloped, b) whether the parcel is included in an HCP preserve area or being developed

⁴⁰ The San Diego County Forest Conservation Initiative limits parcel size to 40 acres, with a maximum density of one dwelling unit per parcel on all parcels affected by the Initiative. County of San Diego, Forest Conservation Initiative Fact Sheet, <http://www.sdcounty.ca.gov/dplu/fcifacts.html>, accessed May 30, 2007.

⁴¹ Personal communication with Dan Halverson, Planning Department, City of Carlsbad, May 30, 2007; personal communication with Connie Diaz, Development Services Department, City of San Diego, May 30, 2007; personal communication with Ashley Gungle, Department of Planning and Land Use, County of San Diego, May 30, 2007; and E-Zoning, Planning and Building Department, City of Encinitas, <http://206.71.175.15/imf/sites/zoning/index.jsp>, accessed May 30, 2007.

and not available for inclusion into an HCP preserve area, c) the size of the parcel if developed, and d) the HCP conservation goals. It is assumed that all private land that has not been developed or previously added or lost (i.e., allowed to develop and not available for inclusion into an HCP preserve area) to an HCP preserve area, will be targeted for addition into a preserve area. The conservation goal is 94 percent for undeveloped private land covered by the County of San Diego Subarea Plan (see Section C.1.2.2) and East County MSCP (see Section C.3.2), and 100 percent for undeveloped private land covered by the cities of San Diego, Carlsbad, and Encinitas subarea plans (see sections C.1.1.2, C.2.1.2, and C.2.2.2). For private land that has already been developed, the analysis assumes that only parcels larger than 10 acres in size will be targeted for inclusion into the HCP preserve areas.⁴² Furthermore, for private lands lost to the HCP preserve areas, the analysis assumes that there will be no development impact on those parcels. For private land added to HCP preserve areas, the economic impacts may include both pre-designation and post-designation costs, depending on when the land was added to the preserve area.

Map Appendix E illustrates the status of lands within the Study Area relative to the HCP preserve areas, showing lands previously added (purple represents a pre-listing gain, light green represents a pre-designation (1998 to 2007) gain, and dark green represents a post-designation gain) or lost (orange) to an HCP preserve area. The maps also detail lands within the Study Area that are already developed (red) and lands that are undeveloped (blue) and potentially available for addition to the preserve area. Lands that are not within the jurisdiction of an approved HCP or expected future HCP's jurisdiction⁴³ include USFS lands in Unit 3 (green), and County and private lands in subunits 1A and 2D (yellow). Preserve areas are compiled in a variety of ways, including 1) conservation of existing public lands; 2) land use restrictions of property within the preserve area through zoning regulations; 3) open space exactions directed toward building the preserve area imposed on new development outside the preserve; 4) open space previously set aside on private lands for conservation as part of the development process; and 5) public acquisition of private lands. For undeveloped privately-owned lands within the Study Area, this analysis assumes that land will be added to the preserve areas through the second and fifth methods. Because the undeveloped privately-owned lands in the Study Area are not public lands, are not outside the preserve area, and are not open space previously set aside as conservation for development, the other three methods are not relevant.

The second step in the estimation includes estimating the per-acre costs of land additions to the preserve area, preserve area management, biological monitoring, and program administration for lands targeted for inclusion in the HCP preserve areas. Local appraisers were contacted for data on regional land values.

⁴² The MSCP will not target developed parcels containing proposed critical habitat and less than 10 acres in size for addition to the preserve area. Personal communication with Thomas Oberbauer, Chief, MSCP Division, Department of Planning and Land Use, County of San Diego, April 26, 2007.

⁴³ The approved Carlsbad HMP and County of San Diego subarea plans provide adequate management and protection for Thornmint in the Study Area. While the Encinitas subarea plan is not in effect and the East County MSCP is not in existence at the time of this report, the results of the analysis assume that these subarea plans will be finalized and approved during the 20 year timeframe of the analysis and therefore will also provide adequate management and protection for the plant.

Based on the information provided by these appraisers and recent sales prices, the analysis assumes that private land committed to the preserve areas will be acquired at a cost of \$5,000 to \$40,000 per acre.⁴⁴ For parcels added to HCP preserve areas during the pre-designation period (1998 to 2007), the amount paid for the most recent land acquisition by the MSCP near Riverside County, \$16,525 per acre, is assumed to represent the land value.

In addition to land acquisition costs, several other annual costs are involved in managing the HCP preserve areas. These include preserve area management costs, biological monitoring costs, and program administration costs. Detailed descriptions of these costs are provided in Appendix C, which are based on either information contained in the HCPs, or from discussions with the HCP authorities. Specifically, the post-designation annual cost of preserve area management, biological monitoring, and program administration is estimated at \$247 per acre for private lands covered by the City of Carlsbad HMP (see Section C.2.1.3 and blue shaded cell in Table C-1), \$200 to \$300 per acre for lands covered by the City of Encinitas Subarea Plan (see Section C.2.2.3), and \$200 per acre for lands covered by the County of San Diego Subarea Plan (see Section C.1.2.3), City of San Diego Subarea Plan (see Section C.1.1.3), and East County MSCP (see Section C.3.3) (all in 2007 dollars). While multiple species will benefit from protective measures provided by the creation and management of preserve areas, no information is available for allocating a portion of the preserve area costs to Thornmint. Therefore, this analysis assumes that preserve area costs are attributable entirely to Thornmint. Attributing all preserve area costs to Thornmint will overstate the overall costs of Thornmint conservation efforts.

While the MSCP contemplates a regional funding source, a regional funding source has not been implemented to date, and each jurisdiction with an approved subarea plan has been individually finding its subarea plan (see Appendix C). The annual pre-designation City of San Diego Subarea Plan monitoring, management, and administrative costs are based on historic information provided by the South County MSCP (\$38 per acre per year). For lands covered by the County of San Diego Subarea Plan and City of Carlsbad HMP, the annual per-acre pre-designation costs of preserve area management, biological monitoring, and program administration are assumed to be the same as those estimated for the future. There are no pre-designation costs associated with East County MSCP or City of Encinitas Subarea Plan, as these plans are under development.

In the third step of estimation, the total economic impacts of the critical habitat designation for Thornmint are estimated. The private land targeted for addition into the preserve areas is assumed to be acquired during the next 20 years, with five percent being acquired each year. Alternatively, if all land in a subunit is acquired at the same time, the analysis assumes a five percent chance of that land being acquired in a given year during the next 20 years. Thus, the present value (*PV*) of land acquisition costs (*AC*) equals

⁴⁴ Land values may range between \$5,000 per acre for less desirable land located far from the ocean and \$40,000 per acre for more desirable land in Carlsbad located near the ocean. The latest acquisition of land by the San Diego County MSCP near Riverside County valued the land at \$16,525 per acre. Personal communication with Quentin Arvin, Appraiser, General Services, San Diego County, April 30, 2007.

$$(1) \quad PV[AC] = \frac{A \cdot c_1}{20} \left[\frac{1}{(1+r)} + \dots + \frac{1}{(1+r)^{20}} \right] = \frac{Ac_1}{20} \left\{ \frac{1 - (1+r)^{-20}}{r} \right\},$$

where A is the acres of land targeted for acquisition in a subunit, r is the discount rate, and c_1 is the acquisition cost per acre. The PV of the annual costs of preserve area management, biological monitoring, and program administration (MC) equals

$$(2) \quad PV[MC] = \frac{A \cdot c_2}{20} \left\{ \left[\frac{1}{(1+r)} + \dots + \frac{1}{(1+r)^{20}} \right] + \left[\frac{1}{(1+r)^2} + \dots + \frac{1}{(1+r)^{20}} \right] + \dots + \frac{1}{(1+r)^{20}} \right\}$$

$$= \frac{A \cdot c_2}{20} \left\{ \frac{(1+r) - (1+r)^{-19} - 20r(1+r)^{-20}}{r^2} \right\}$$

where c_2 is the sum of the annual costs of preserve area management, biological monitoring, and program administration per acre.

The PV of total economic impacts of critical habitat designation for the Thornmint equals the sum of the PV of land acquisition costs and the PV of the annual costs of preserve area management, biological monitoring, and program administration.

In the final step, the distribution of total economic impacts among different interest groups, including private landowners, developers, Federal and state governments, and local governments is estimated based on the historical funding sources for the HCPs. For the habitat subunits covered by the County of San Diego Subarea Plan (see Section C.1.2.3) and City of San Diego Subarea Plan (see Section C.1.1.3), the share of funding responsibility for monitoring and management is assumed to be approximately 20 percent by Federal and state government and 80 percent by local government, and the share of the funding responsibility for land acquisition is assumed to be one-third private landowner (i.e., zoning restrictions, mitigation, and exactions), one-third Federal and state governments (i.e., through acquisitions by wildlife agencies), and one-third local governments, corresponding with current and expected future funding sources. The MHCP costs for the City of Carlsbad HMP are summarized in Table C-1 in Appendix C (see Section C.2.1.3). While developers are expected to bear 42 percent of the total costs of setting up the entire preserve area and the annual cost of management, monitoring, and administration of the preserve area in perpetuity, followed by private landowners, including homeowners' associations (HOAs) (22 percent), Federal and state governments (19 percent), the City of Carlsbad (10 percent), and other public organizations (7 percent), this analysis anticipates that only private landowners will be responsible for funding the costs of setting up the preserve area related to the Thornmint and the annual program costs under the cities of Carlsbad and Encinitas MHCP subarea plans (see Section C.2.2.3), as the Study Area lands targeted for addition into the Carlsbad and Encinitas preserve areas are privately-owned.

While East County MSCP is not in existence at the time of this report, the results of the analysis assume the plan will be finalized and approved by 2010. Since no draft plan for East County MSCP exists at this time, the cost structure for the Plan is uncertain. This analysis therefore assumes that the East County MSCP funding structure will be similar to the cost structures of the County of San Diego MSCP Subarea Plan (see Section C.3.3). If the actual costs and distribution of economic impacts for the East County MSCP differ from the County Subarea Plan, the economic impacts, and distribution of impacts, estimated in this report would be misrepresented. However, absent specific information, the costs and distribution of economic impacts from the County Subarea Plan are considered reasonable surrogate for impacts and the distribution of impacts. The Thornmint conservation goals and costs for the relevant HCPs are summarized in Table 2-1.

**Table 2-1
Summary of HCP Thornmint Conservation Goals and Costs**

HCP	Annual HCP Program Costs	Cost Breakdown	Conservation Goal	Land Acquisition Costs
County of San Diego MSCP Subarea Plan	\$200/acre pre- & post-designation	Land Acquisition: 33% private 33% state & Federal government 33% local government	94%	\$16,525/acre pre-designation
East San Diego County MSCP	\$200/acre post-designation			
City of San Diego MSCP Subarea Plan	\$38/acre pre-designation \$200/acre post-designation	Monitoring & Management: 80% local government 20% state & Federal government	100%	\$5,000 - \$40,000/acre post-designation
Carlsbad MHCP Subarea Plan	\$247/acre pre- & post-designation	100% private		
Encinitas MHCP Subarea Plan	\$200 - \$300/acre post-designation			

2.3 PAST ECONOMIC IMPACTS

Total pre-designation (1998 to 2007) development-related economic impacts of critical habitat designation consist of the cost of developing the HCPs that provide protection for the Thornmint, the cost of acquiring and adding private lands to the HCP preserve areas, and the cost of HCP preserve area management, biological monitoring, and program administration (see Section 2.2). In total, this analysis estimates that 182 acres within three habitat units (1B, 2B, and 3B) were added to the HCP preserve areas during the pre-designation period. The total value of these lands is estimated to be \$2.9 million (in 2007 dollars). The total cost associated with preserve area management, biological monitoring, and program administration is estimated at \$61,000 (in 2007 dollars). Thus, the total pre-designation economic impact of critical habitat designation is estimated to be \$3.0 million (in 2007 dollars). Approximately 67 percent of the total pre-designation economic impact occurred in Subunit 3B, 33 percent in Subunit 1B, and less than 0.10 percent in Subunit 2B. There were no pre-designation economic impacts in the other subunits

because no private lands were added to the HCP preserve areas during the pre-designation period in those subunits.

As described in Section 1.4, HCPs do not grant incidental take permits for plant species; however, if a listed plant occurs in an area subject to the HCP, the Service must consider whether the proposed activities may adversely affect or jeopardize the continued existence of the plant. While the Thornmint will benefit from protective measures provided by the HCPs, no information is available to allocate the cost to develop the HCPs among all the covered species. Therefore, this analysis does not allocate the costs of developing the HCPs to the Thornmint. While there is no clearly defined basis for allocating the costs, it is noted that the Thornmint is one of 24 (City of Carlsbad HMP) to more than 250 species (East County MSCP) covered by authorized plans or considered by plans presently under development (see Table 2-2), and that the Study Area for Thornmint (1,867 acres) comprises a small component of any one plan's study area and preserve area; the proportion of private lands in the Study Area (519 acres) is even smaller. Thornmint-related HCP development efforts were likely a relatively minor component of the overall HCP development efforts and, thus, a minor component of the total HCP development costs. Furthermore, areas covered by the HCPs are being considered for exclusion from the final critical habitat. Nevertheless, attributing no HCP development costs to Thornmint will understate the overall costs of pre-designation Thornmint conservation efforts.

**Table 2-2
Summary of HCPs**

HCP	Year	Covered Species	Cost to Complete	HCP Area	Proposed Thornmint Habitat
City of San Diego MSCP Subarea Plan	1997 (pre-listing)	85	\$6 – \$7 million	Study Area: 206,124 acres Preserve Area: 56,831 acres	115 acres
County of San Diego MSCP Subarea Plan	1997 (pre-listing)	85	\$1 million	Study Area: 252,132 acres Preserve Area: 101,268 acres	902 acres
Carlsbad MHCP Subarea Plan	2004 (pre-designation)	24	\$750,000	Study Area: 24,570 acres Preserve Area: 7,136 acres	161 acres
Encinitas MHCP Subarea Plan	Estimated 2008 (post-designation)	32	\$100,000 – \$150,000	Study Area: 13,346 acres Preserve Area: 2,123 acres	92 acres
East San Diego County MSCP	Estimated 2010 (post-designation)	> 250	Unknown	Study Area: 1.6 million acres Preserve Area: 320,000 acres	597 acres

2.4 FUTURE ECONOMIC IMPACTS

The total economic impacts of the species and habitat conservation in the Study Area and the distribution of the total impacts among private landowners and local, state, and Federal taxpayers are estimated using the method described in Section 2.2. In total, this analysis estimates that 158 acres of private undeveloped lands owned by 9 private landowners and five acres of undeveloped land owned by the cities of San Diego and Poway within the Study Area will be acquired and added to the HCP preserve areas.

These lands will then be managed with the 182 acres of undeveloped land within the Study Area that were acquired and added to the preserve areas during the pre-designation period (1998 to 2007) in accordance with HCP guidelines. The total costs of land acquisition, preserve area management, biological monitoring, and program administration in the Study Area are summarized in Table 2-3.

**Table 2-3
Summary of Post-Designation Economic Impacts in the Study Area, Three Percent
Discount Rate, High Range Estimates, 2008 – 2027**

Category	\$
Land Acquisition (163 acres)	\$607,000 – \$4,855,000
Preserve Management, Biological Monitoring, & Program Administration (345 acres)	\$514,000
TOTAL	\$1,120,000 – \$5,368,000

Numbers may not sum due to rounding.

Over 61 percent of the future impacts in the Study Area are forecast to occur in three subunits; 3D (27 percent), 3A (18 percent), and 2C (16 percent). Subunits 4D and 3C are the sources of an additional 12 percent and six percent of the impacts, respectively. The remaining 12 subunits collectively account for the remaining 21 percent of economic impacts. The total economic impacts of species conservation activities are expected to be zero in subunits 2D, 3E, and 4B as there are no private undeveloped lands (i.e., that are available for development) or local government-owned undeveloped lands in these subunits.

Following the HCP funding structures described in Appendix C and summarized in Table 2-1, the analysis estimates that most of the development impacts in the Study Area (35.2 percent, or \$1.89 million) are expected to be borne by private landowners/HOAs, with 30.7 percent of the impacts (\$1.65 million) being borne by the County of San Diego, 30.3 percent (\$1.63 million) by Federal and state governments, 3.1 percent (\$167,000) by the City of San Diego, and 0.7 percent (\$39,000) by the City of Poway.

2.5 SUMMARY OF IMPACTS

Table F-2 in Appendix F provides a summary of impacts related to development that are anticipated to occur (post-designation) due to the proposed final designation. There are no pre-designation impacts between 1998 and 2007 associated with development in areas proposed for final designation. Following the designation, approximately \$451,000 to \$2.7 million in post-designation development impacts are forecast in undiscounted dollars, or \$326,000 to \$2.0 million and \$224,000 to \$1.4 million in present value terms at discount rates of three and seven percent, respectively. Expected annualized impacts are estimated to range from \$21,000 to \$133,000 (at three percent) and \$21,000 to \$132,000 (at seven percent). Approximately 74 percent of the potential post-designation development impacts are forecast to occur on private lands in Subunit 3D, 16 percent in Subunit 3C, and 10 percent in Subunit 3F (see Figure

2-1). Most of the development impacts in the proposed final designation (36 percent, or \$701,000) are expected to be borne by the County of San Diego, with 33 percent of the impacts (\$647,000) being borne by state and Federal governments, and 32 percent (\$629,000) by private landowners.

In areas being considered for exclusion from final critical habitat, pre-designation (1998 to 2007) impacts associated with development are estimated to total \$3.0 million. Following the designation, approximately \$1.1 to \$4.6 million in post-designation development impacts are forecast in undiscounted dollars, or \$794,000 to \$3.4 million and \$527,000 to \$2.4 million in present value terms at discount rates of three and seven percent, respectively. Expected annualized impacts are estimated to range from \$54,000 to \$230,000 (at three percent) and \$49,000 to \$225,000 (at seven percent).

2.6 CAVEATS TO ECONOMIC ANALYSIS OF IMPACTS ON DEVELOPMENT ACTIVITIES

Table 2-4 discusses sources of uncertainty regarding impacts on development.

**Table 2-4
Caveats to the Economic Analysis of Impacts on Development**

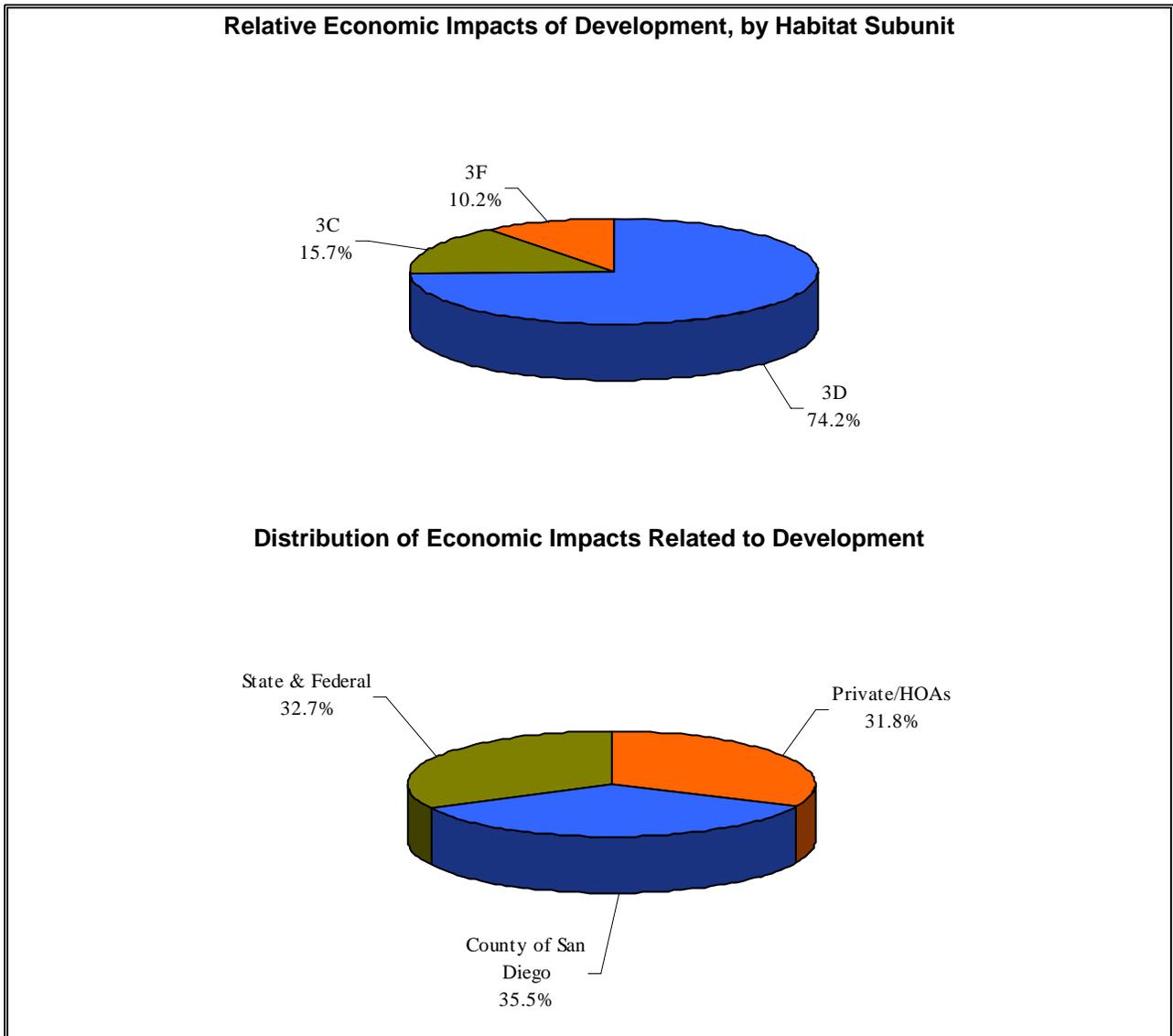
Key Assumption	Effect on Impact Estimate
The County of San Diego Subarea Plan and East County MSCP will target 94 percent of the private land within the Study Area for acquisition and inclusion into the preserve area; the other three subarea plans will target 100 percent of this land.	+
The costs of the San Diego County Subarea Plan are considered representative of the costs of the future East County MSCP	+/-
Preserve area acquisition, monitoring, and management are attributable entirely to Thornmint	+
Additional preserve area lands will be acquired at a cost of \$5,000 to \$40,000 per acre.	+/-

- : 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.

Figure 2-1
Economic Impacts to Development in Areas Proposed for Final Designation, in \$1,000s



This chapter describes the past and expected future economic impacts associated with recreation in the Study Area. Specifically, this analysis estimates the direct and indirect economic impacts of Thornmint conservation related to recreational activities such as off-highway vehicle (OHV) use, horseback riding, and shooting. This chapter is divided into six sections. The first provides an overview of recreation in the Study Area and a general discussion of the management of these lands. Next is a description of the methods used to estimate the recreation-related economic impacts of Thornmint conservation. This is followed by discussions of the past and future economic impacts associated with recreation in the Study Area. After a brief summary of economic impacts, the final section identifies and discusses caveats to the analysis.

3.1 BACKGROUND

The proposed rule identifies human recreation leading to species destruction and habitat degradation as one of the primary threats to Thornmint in all subunits.⁴⁵ Recreational activities in the Study Area that may harm the species and its habitat include hiking, OHV use, and mountain biking. Further, many subunits are undeveloped and vacant areas near urban developments, thus providing convenient venues for both authorized and unauthorized recreation. Given the variation in recreation management by different landowners and at different locations, the recreational situation in each of the proposed critical habitat units is analyzed separately.

3.1.1 UNIT 1

The three subunits in Unit 1 are located north of San Diego in the suburban communities of Carlsbad and Encinitas. As such, areas within the Study Area in this unit receive high pressure from authorized and unauthorized recreators residing in nearby subdivisions.

Subunit 1A is located across from Palomar Airport in Carlsbad, and consists of County of San Diego and private lands. Although no recreation is authorized in the Subunit, the County property is used by mountain bikers, rock climbers, hikers, and runners. In March 2006, CNLM began managing and restoring approximately 20 acres of County-owned land in Subunit 1A. The CNLM is managing and restoring this land as part of the 326 acres it manages; 109 acres consist of a conservation easement on County-owned land and 218 acres make up the land CNLM acquired in early 2007. The restoration efforts include obliterating unwanted trails, maintaining desirable trails, destroying encampments, cleaning trash, and erecting signs. Following the completion of these restoration efforts in 2010, CNLM

⁴⁵ Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for *Acanthomintha ilicifolia* (San Diego thornmint), *Federal Register*, Vol. 72, No. 49, p. 11954, March 14, 2007.

plans to manage the land as a habitat preserve open to hikers and runners, however, the annual number of expected visitors is not known. The portion of Subunit 1A owned by the County, but not managed by CNLM, is not actively managed for recreation despite steady unauthorized use.⁴⁶ Additionally, this analysis assumes that the small tract of private land within Subunit 1A is not managed for recreation.

Subunit 1B is a privately-owned and managed open space easement, which intertwines with the subdivision development in southeast Carlsbad. A small portion of the land is owned by the Santa Fe Trails Owners Association, while the remainder is the property of an unidentified HOA.⁴⁷ Recreation-related management activities for Thornmint on these private lands are unknown, but assumed to occur as these lands are part of the City of Carlsbad HMP preserve area.

Subunit 1C, located in Encinitas, is mostly contained within a CNLM-managed mitigation bank, with the remainder in a privately-owned open space easement. CNLM manages the mitigation bank as a habitat preserve, and maintains hiking trails for visitors. With over 5,000 people recreating at the preserve annually, dealing with unauthorized recreation is a substantial part of managing the preserve. CNLM erects signs to keep hikers on the trails and to inform visitors of the recreation restrictions. They also build barricades to restrict trespassing and conduct community outreach to update users regarding regulations at the preserve.⁴⁸

3.1.2 UNIT 2

Unit 2 is comprised of four subunits situated within and just east of the City of San Diego. Subunits 2A, 2B, and 2C are owned and managed by local governments, but differ greatly in terms of recreation management. Subunit 2D is an open space easement set aside by Asphalt, Inc. in a permitting agreement that allowed the company to mine on adjacent lands.⁴⁹ The land in Subunit 2D is private and not actively managed for recreation.

Subunit 2A is part of Los Peñasquitos Canyon Preserve, which is owned by the City of San Diego and managed by the City's Department of Parks and Recreation. The 3,400-acre park attracts around 30,000 hikers, mountain bikers, and horseback riders annually. Three full-time park rangers manage recreation in the park through enforcement patrols, interaction with visitors, and maintenance of fencing and signs.

⁴⁶ Personal communication with Jessica Vinje, Preserve Manager, Center for Natural Lands Management, April 24, 2007.

⁴⁷ Personal communication with Mike Grim, Senior City Planner, City of Carlsbad, April 18, 2007.

⁴⁸ Personal communication with Jessica Vinje, Preserve Manager, Center for Natural Lands Management, May 15, 2007.

⁴⁹ Personal communication with Thomas Oberbauer, Chief, MSCP Division, Department of Planning and Land Use, County of San Diego, April 18, 2007.

Additionally, volunteer groups at Los Peñasquitos contribute over 100 labor hours annually on Thornmint conservation projects.⁵⁰

Subunit 2B is a parcel of open space land managed by the City of San Diego Department of Parks and Recreation. Most of the land is owned by the City of San Diego, except for one site. This site is the property of the City of Poway, and was once a water treatment facility.⁵¹ The land is not managed for recreation, although unauthorized recreation likely occurs.⁵²

Subunit 2C is mostly contained within the County of San Diego's Sycamore Canyon and Goodan Ranch preserves. Less than ten percent of this Subunit occurs on private lands. Together, the adjacent Sycamore Canyon and Goodan Ranch preserves attract over 5,000 hikers, mountain bikers, and horseback riders annually.⁵³ The County Department of Parks and Recreation maintains signs and fences to manage recreation, and staffs a Ranger to monitor the preserves and inform visitors.

3.1.3 UNIT 3

Unit 3 is made up of six subunits in or adjacent to the Viejas and Poser Mountain areas of Cleveland National Forest (CNF) near Alpine, California. Except for Subunit 3A, which is privately owned, all of the subunits in Unit 3 are at least partially within CNF. Nearly all of Subunit 3B will be acquired by USFS and incorporated into CNF by the end of 2007 as part of a development agreement with Viejas Hills Partners, LLC.⁵⁴ Subunits 3C, 3D, and 3F are approximately 40, 90, and 95 percent contained within CNF, respectively, while Subunit 3E is entirely within CNF.

Viejas and Poser Mountains experience moderate recreation pressure in the form of hiking on unmaintained trails and unauthorized OHV use on Anderson Truck Trail. The Viejas and Poser Mountain portions of CNF are designated as critical biological areas, which prohibit non-passive recreation.⁵⁵

⁵⁰ Personal communication with Gina Washington, Senior Ranger, Los Peñasquitos Canyon Preserve, San Diego Department of Parks and Recreation, May 2, 2007.

⁵¹ Personal communication with Jim Lyon, Senior Planner, City of Poway, April 26, 2007.

⁵² Personal communication with Melanie Johnson, MSCP Biologist, City of San Diego, April 25, 2007.

⁵³ Personal communication with Maeve Hanley, Resource Management Division, County of San Diego Department of Parks and Recreation, April 26, 2007.

⁵⁴ Personal communication with Michael W. Reynolds, Developer, Viejas Hills Partners, LLC, April 25, 2007.

⁵⁵ Personal communication with Tim Cardoza, Lands and Recreation Officer, Cleveland National Forest, U.S. Forest Service, April 12, 2007.

3.1.4 UNIT 4

Unit 4 contains four subunits, three of which (4A, 4B, and 4C) are clustered on McGinty Mountain, near Jamul, California. The fourth Subunit, 4D, is situated southwest of Jamul in Hollenbeck Canyon. The McGinty Mountain subunits straddle private, Service, CDFG, and non-profit lands, although land ownership in the area is currently in a flux. With the bankruptcy of TET in 2005, the Service agreed to acquire the TET lands and add them to the San Diego National Wildlife Refuge (SDNWR); the acquisition is expected to take place by the end of 2007.⁵⁶ The Nature Conservancy is also planning to transfer their lands on McGinty Mountain to the Service, and the transaction is anticipated to occur in approximately five years.⁵⁷ The existing Service lands are part of SDNWR, and receive moderate pressure from hikers on the unmaintained trail system and from illegal OHV users. The Service manages recreation in the area by maintaining gates and restricting OHV use with boulders and other barriers. The situation is similar on the TET, TNC, and CDFG lands, except that the TNC trails are maintained and that virtually no management has occurred on TET lands.⁵⁸

CDFG acquired Hollenbeck Canyon in 2001 with knowledge of the canyon's value as habitat. Some hiking on the trails of Hollenbeck Canyon, as well as illegal OHV use occurs in the area. CDFG manages recreation by maintaining gates and fences, and placing barriers to restrict OHVs.

3.2 OVERVIEW OF APPROACH TO ESTIMATING IMPACTS

The estimation of economic impacts associated with recreation management on public and private lands comprises the cost associated with managing authorized recreation and the cost of restricting unauthorized recreation. This analysis characterizes the recreation management actions taken in each subunit based on discussions with various land managers. Potential management actions might include use of signs, use of barriers such as fences and gates, patrolling, obliteration of trails, and outreach programs to control recreation within the habitat. Also, should welfare gains or losses be incurred from the management of authorized recreation for the Thornmint, the analysis will quantify the gained or lost trips and base the estimated net welfare impacts on the results of a literature review of welfare values for recreation. The welfare impacts of lost user days resulting from actions to restrict unauthorized recreation will not be quantified in this analysis.

As described in Section 3.1.1, beginning in 2010, CNLM plans on allowing running and hiking on 326 acres of land it manages in and around Subunit 1A that are currently closed to authorized recreation. However, the annual number of expected visitors on this land is not known and the value of additional recreation opportunities related to Thornmint conservation cannot be estimated in this report. While this

⁵⁶ Personal communication with Real Estate Specialist, Service, April 25, 2007.

⁵⁷ Personal communication with Zach Principe, The Nature Conservancy, May 7, 2007.

⁵⁸ Ibid.

may result in an overestimation of estimated impacts, most of the additional recreation opportunities are expected to occur on lands outside the Study Area, as the 20 acres of Subunit 1A managed by CNLM represents only six percent of the total 326-acre area. Because additional welfare gains or losses are not expected on other properties within the Study Area, this analysis will focus on recreation compliance cost.

On private lands, unless a Federal nexus is present, private landowners are not obligated by the Service to take actions to manage or minimize the impact of their recreational activities on plants located on their property. Therefore, compliance costs and welfare impacts related to recreational activities on private lands (i.e., lost user days) are not anticipated in this report. However, as discussed in Chapter 2.0, management of recreation will be carried out on private lands to be managed under one of the several HCPs that provide for the protection of the Thornmint in San Diego County (see Appendix C). Thus, costs associated with actions to control recreation are included in the management costs of the HCPs, and these impacts are accounted for in the analysis of development activities of this study (see Chapter 2.0).

3.3 PAST ECONOMIC IMPACTS

Since the Thornmint was Federally-listed as threatened in 1998, some conservation actions related to recreation management have been carried out within the Study Area between 1998 and 2007. This section details these actions.

3.3.1 UNIT 1

All parts of subunits 1B and 1C have been managed for recreation since listing of the species, while only a portion of Subunit 1A has been managed for recreation since 2006. When CNLM began managing the northwest quarter of Subunit 1A, actions were taken to restrict unauthorized mountain bikers, rock climbers, and hikers. These measures included installation of fences, erection of signs, and obliteration of trails in an effort to return the habitat to a more natural state. The first year costs to CNLM for the habitat restoration efforts totaled approximately \$2,500, with subsequent annual recreation-related management expenses equaling approximately \$500 (in 2007 dollars).⁵⁹ The remaining three quarters of Subunit 1A is owned by the County of San Diego and is not managed for recreation.

Since Subunit 1B is part of the City of Carlsbad HMP preserve area, impacts related to recreation management on these private lands are captured in the preserve management costs estimated in Chapter 2.0, and are not included in this chapter in order to avoid double-counting. In Subunit 1C, the heavy recreational use prompted the land manager, CNLM, to make controlling recreation a priority. The organization spends approximately \$2,560 (in 2007 dollars) within the Study Area annually on signs, fencing, barriers, patrolling, and outreach to promote compliance with preserve regulations.⁶⁰ This

⁵⁹ Personal communication with Jessica Vinje, Preserve Manager, Center for Natural Lands Management, April 24, 2007.

⁶⁰ Ibid, May, 15, 2007.

analysis assumes that all of CNLM's aforementioned 'public services' budget is for recreation compliance related to the Thornmint, although this is likely an overestimate.

3.3.2 UNIT 2

Within Unit 2, while subunits 2A and 2C have been actively managed for recreation since Thornmint listing, no recreation management has occurred in subunits 2B and 2D. Subunit 2A is within Los Peñasquitos Canyon Preserve, a popular recreation area managed by the City of San Diego Department of Parks and Recreation. Since 1998, the Department has spent approximately \$2,250 annually (in 2007 dollars) on signs and fences, which are erected by volunteers to protect the Thornmint from recreation activities.⁶¹ Volunteers have spent approximately 40 hours annually assisting with recreation management for the Thornmint, which amounts to a labor cost of \$910 per year (in 2007 dollars).⁶²

Subunit 2C is a part of the Goodan Ranch and Sycamore Canyon preserves that have been managed by the County of San Diego Department of Parks and Recreation since 1991. Discussions with the Department employees revealed substantial efforts in terms of recreation management, but were unsuccessful in yielding specific expenditure estimates.⁶³ In the absence of such information, this analysis assumes recreation management expenditures equal management estimates from the County of San Diego MSCP for lands isolated from urban development.⁶⁴ This implies annual recreation management expenditures of \$10,210 (in 2007 dollars) on the 276 acres in Subunit 2C managed by the County of San Diego. However, given that the South County MSCP budget covers all management activities, the above assumption likely overestimates actual recreation management expenditures to protect the Thornmint.

3.3.3 UNIT 3

Most of the subunits in Unit 3 are contained within USFS-managed lands. This analysis assumes that all recreation management expenditures for the Viejas and Poser mountain areas of CNF occur within the

⁶¹ It is assumed that half of the fences and signs erected in Los Peñasquitos are meant to protect the Thornmint within the proposed critical habitat. Personal communication with Gina Washington, Senior Ranger, City of San Diego Department of Parks and Recreation, May 2, 2007.

⁶² Assumes a wage rate of \$22.76 per hour from the Carlsbad Open Space Management Plan (OSMP) for general labor, Appendix A, Carlsbad OSMP Funding Analysis. Also assumes that 40 of the 115 volunteer labor hours spent on the Thornmint are for recreation management, with the remainder spent on exotic species management.

⁶³ Personal communications with Maeve Hanley, Group Program Manager, County of San Diego Department of Parks and Recreation, April 27, 2007; and Bill Boglin, Park Attendant, April 20, 2007.

⁶⁴ County of San Diego MSCP, August 1998, Section 7, page 1, "Preserve management costs are expected to range from \$37/year for lands isolated from urban development to \$47..."

habitat subunits. USFS spends around \$5,000 a year (in 2007 dollars) in the Viejas and Poser mountain areas to maintain OHV barriers and to enforce recreation restrictions with ranger patrols.⁶⁵

3.3.4 UNIT 4

Unit 4 is comprised of three subunits on McGinty Mountain and one subunit in Hollenbeck Canyon. Currently, non-private land ownership is divided between the Service, CDFG, TET, and TNC. As with the USFS lands in Unit 3, this analysis assumes that all recreation management expenditures on a particular tract of land on McGinty Mountain occur within, or are associated with, the Study Area. This assumption may inflate per-acre management costs, especially in the Service refuge, which contains less than three acres of the Study Area. The following summarizes the past economic impacts associated with recreation-related management of Service, CDFG, TET, and TNC lands in Unit 4.

- TET filed for bankruptcy in July of 2005, following years of financial turmoil. The under-funded land management organization neglected many of their Southern Californian properties for years, providing virtually no management beyond periodic visits to ensure that the land had not burned.⁶⁶ Because of this lack of management, this analysis assumes that no recreation management occurred on TET lands on McGinty Mountain from 1998 to present.
- TNC manages two tracts of land on McGinty Mountain that contain large portions of subunits 4B and 4C. The non-profit organization allows hiking on its property, and spends around \$2,000 per year (in 2007 dollars) on fences and barriers to restrict unauthorized recreation.⁶⁷ Similarly, the Service only allows passive recreation on the SDNWR, spending \$2,000 per year (in 2007 dollars) on installing gates and barriers in order to restrict unauthorized recreation.⁶⁸
- The CDFG managed land on McGinty Mountain contains seven acres of Subunit 4B. While only a few management actions are taken on CDFG's McGinty property, the Department does spend approximately \$200 per year (in 2007 dollars) to repair fences meant to block OHV use.⁶⁹

⁶⁵ Personal communication with Tim Cardoza, Assistant Recreation Officer, Cleveland National Forest, U.S. Forest Service, May 9, 2007.

⁶⁶ Lee, Mike, September 20, 2005, "Regional Open Space Left on Shaky Ground", *San Diego Union-Tribune*, http://www.signonsandiego.com/uniontrib/20050920/news_1n20trusts.html, accessed May 10, 2007.

⁶⁷ Personal communication with Zach Principe, Biologist, The Nature Conservancy, April 4, 2007.

⁶⁸ Personal communication with U.S. Fish and Wildlife Service Biologist, San Diego Bay National Wildlife Refuge, April 18, 2007.

⁶⁹ Personal communication with Tim Dillingham, Land Manager, California Department of Fish and Game, April 9, 2007.

On December 31, 2001, CDFG acquired a 5,200 acre tract of land in Hollenbeck Canyon, which contains most of Subunit 4D. Since the acquisition, CDFG spends approximately \$71 per year (in 2007 dollars) in the Subunit to maintain fences and patrol the canyon to restrict unauthorized OHV use.⁷⁰

3.4 FUTURE ECONOMIC IMPACTS

As implied in previous discussions, only anticipated impacts of critical habitat designation on managing authorized recreation and restricting unauthorized recreation are quantified in the following analysis.

3.4.1 UNIT 1

The future annual costs of recreation management in Unit 1 are anticipated to remain the same as past costs.

3.4.2 UNIT 2

The future annual costs of recreation management in Unit 2 are anticipated to remain the same as past costs.

3.4.3 UNIT 3

Beginning in 2008, USFS will manage an additional 141 acres of Subunit 3B acquired in 2007 as mitigation for impacts of adjacent development.⁷¹ However, USFS does not anticipate the addition of these lands to change annual recreation-related management costs in the Viejas and Poser Mountain portions of the CNF.⁷² Therefore, future annual costs of recreation management in Unit 3 are expected to remain the same as past costs.

3.4.4 UNIT 4

The recreation management cost structure for the Service in Unit 4 is expected to change in 2008, and then again in 2012. By 2008, the Service will acquire the lands from bankrupt land manager TET, and incorporate those lands into the SDNWR. This analysis assumes that the Service will incur per-acre recreation management costs equal to those of TNC, and then applies those costs to the number of proposed habitat acres on TET land. Based on this approach, the Service is forecast to incur \$1,585 (in 2007 dollars) in additional recreation management costs on the land it acquires from TET. The Service

⁷⁰ Ibid.

⁷¹ Personal communication with Tim Cardoza, Assistant Recreation Officer, Cleveland National Forest, U.S. Forest Service, April 19, 2007.

⁷² Ibid, May 9, 2007.

also plans to open a trail leading to the summit of McGinty Mountain in 2008, which will pass by a sensitive population of Thornmint. In order to protect the species from trampling, the Service plans to build a \$7,500 (in 2007 dollars) fence around the population.⁷³ This analysis assumes the annual repair and maintenance budget for the fencing effort will be similar to the annual cost of \$200 (in 2007 dollars) incurred by CDFG to maintain its fence on McGinty Mountain (see Section 3.3.4).

The Service plans to acquire and incorporate TNC's lands into the SDNWR by 2012. This analysis makes two assumptions about the transaction: First, that the transaction occurs at the end of 2011; and second, that the Service will incur the recreation management costs of \$2,000 annually (in 2007 dollars) currently borne by TNC (see Section 3.3.4).

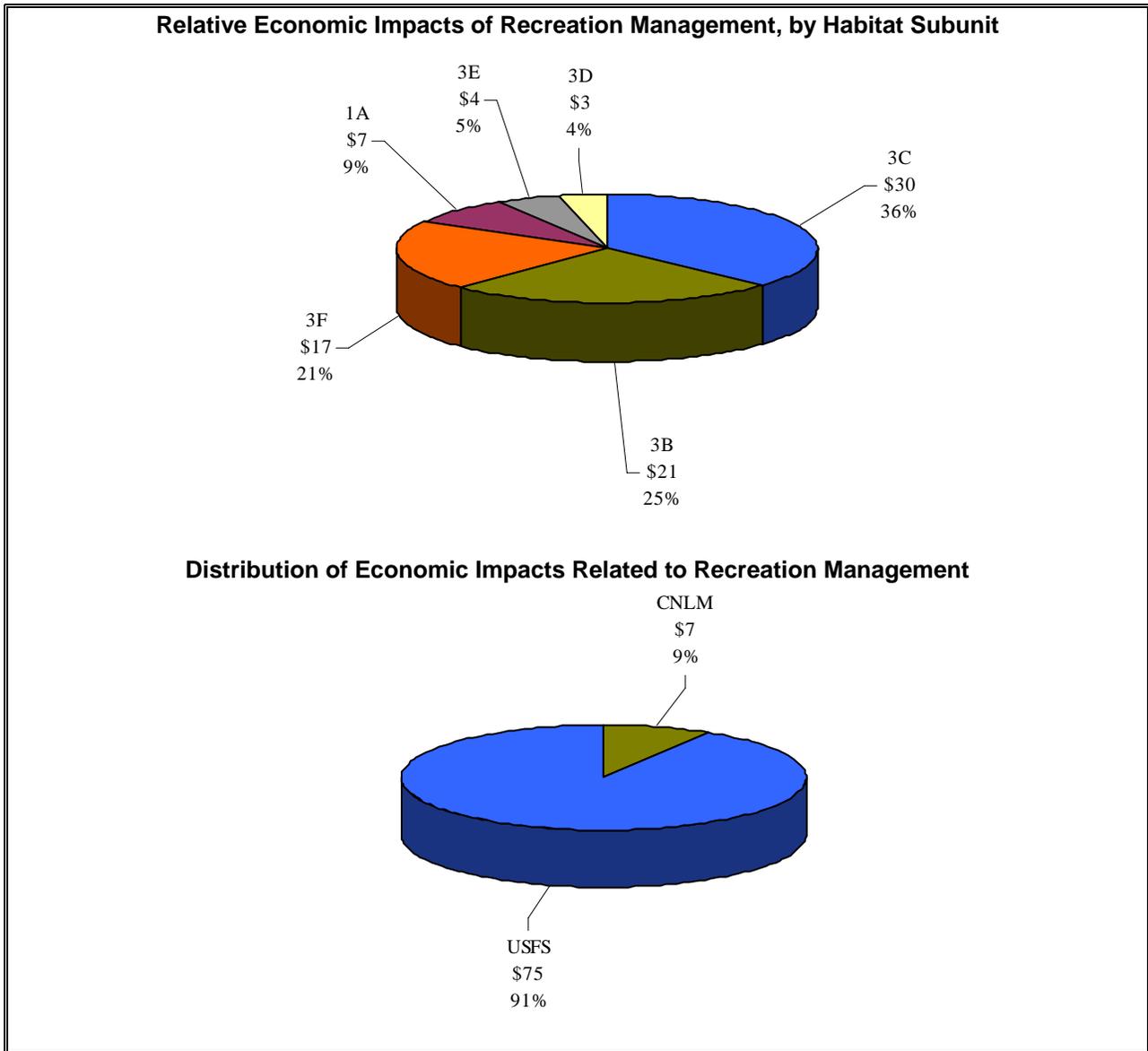
3.5 SUMMARY OF IMPACTS

Table F-3 in Appendix F provides a summary of impacts related to recreation management for Thornmint conservation within the proposed final designation. Pre-designation (1998 to 2007) impacts associated with recreation are estimated at \$53,000. Following the designation, approximately \$109,000 in post-designation recreation impacts are forecast in undiscounted dollars, or \$82,000 and \$58,000 in present value terms at discount rates of three and seven percent, respectively. Expected annualized impacts are estimated at \$4,000 at both a three and seven percent discount rates. Approximately 91 percent of the potential post-designation recreation management impacts are forecast to occur on USFS lands in subunits 3C (37 percent), 3B (25 percent), 3F (21 percent), 3E (five percent), and 3D (four percent). The remaining nine percent of recreation-related impacts are expected to occur on County of San Diego lands in Subunit 1A.

In areas being considered for exclusion from final critical habitat, the analysis estimates \$191,000 in pre-designation impacts associated with recreation management. Following the designation, approximately \$426,000 in post-designation impacts are forecast in undiscounted dollars, or \$319,000 and \$228,000 in present value terms at discount rates of three and seven percent, respectively. Expected annualized impacts are estimated at \$21,000 at both the three and seven percent discount rates.

⁷³ Personal communication with U.S. Fish and Wildlife Service Biologist, San Diego Bay National Wildlife Refuge, April 18, 2007.

Figure 3-1
Economic Impacts to Recreation in Areas Proposed for Final Designation, in \$1,000s



3.6 CAVEATS TO ECONOMIC ANALYSIS OF IMPACTS ON RECREATION

Table 3-1 discusses sources of uncertainty regarding impacts on recreation management.

**Table 3-1
Caveats to the Economic Analysis of Impacts on Recreation**

Key Assumption	Effect on Impact Estimate
Following the completion of restoration efforts in 2010, CNLM plans to manage 326 acres, including 20 acres of Subunit 1A, as a habitat preserve open to hikers and runners, however, the annual number of expected visitors is not known and is not quantified in the report.	+
All of the recreation management actions undertaken by the Service, USFS, TNC, and CDFG on Viejas and McGinty mountains occur within the Study Area.	+
The cost of recreation management in Subunit 1B (fencing, patrols, and signs) is equal to the cost projection for these activities estimated in the Carlsbad Open Space Management Plan (OSMP).	+/-
Fifty percent of the fencing and signage costs in Subunit 2A are related to Thornmint conservation.	+/-
The cost of recreation management in Subunit 2C (\$37 per acre) is equal to the projection for total land management costs on lands isolated from urban areas in the South County MSCP.	+
All of CNLM's 'public services' budget is spent on controlling recreation for Thornmint conservation.	+
Following the acquisition of TET and TNC lands on McGinty Mountain, the Service will incur annual recreation management costs equal to the estimated per acre management costs currently incurred by TNC.	+/-
The Friends of Los Peñasquitos Canyon Preserve spend 40 of 115 total volunteer Thornmint conservation hours working on recreation management (installing fences, signs, barriers, etc.).	+/-

- : 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.

This chapter describes the past and expected future economic impacts associated with exotic plant species-management in the Study Area. Specifically, this analysis estimates the direct and indirect economic impacts of the monitoring, prevention, and control of exotic plant species such as, *Cynara cardunculus* L. (Artichoke Thistle), *Centaurea melitensis* (Tocalote), and exotic grasses due to Thornmint conservation activities.⁷⁴ This chapter is divided into six sections. The first provides an overview of exotic plant species prevalence in the Study Area and a general discussion of the exotic species management efforts on these lands. Next is a description of the methods used to estimate the exotic plant species management-related economic impacts of Thornmint conservation. This is followed by discussions of past and future economic impacts to exotic plant species management in the Study Area. Then, a brief summary of impacts is presented. The final section identifies and discusses caveats to the economic analysis.

4.1 BACKGROUND

According to the proposed rule, the presence of exotic plants may harm the species and its habitat in all subunits.⁷⁵ These invasive species, including Artichoke Thistle, Tocalote, and other exotic plants may compete with native species. Given the variation in management of invasive plants by different landowners and at different locations, the exotic plant species-management situation in each subunit is considered below. While the following paragraphs provide information on management of exotic plant species within the Study Area, they do not elaborate upon land ownership in the areas. Details regarding land ownership in the critical habitat units/subunits are presented in Chapter 3.0.

4.1.1 UNIT 1

The propagation of exotic plant species is an indirect effect of urban development. Since the three subunits of Unit 1 are located in suburban communities, the land within the Unit is particularly susceptible to the threat of such exotic plants.

Exotic plant species are prevalent throughout Subunit 1A. However, until recently, no management actions to control non-native plants had occurred in the Subunit. The restoration efforts by CNLM in the area since 2006 include weed management and monitoring for conservation of Thornmint. Despite

⁷⁴ Personal communications with Jessica Vinje, Preserve Manager, Center for Natural Lands Management, April 24, 2007; Mike Kelly, Volunteer, Friends of Goodan Ranch, April 27, 2007; and Gina Washington, Senior Ranger, Los Peñasquitos Canyon Preserve, San Diego Department of Parks and Recreation, May 2, 2007.

⁷⁵ Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for *Acanthomintha ilicifolia* (San Diego thornmint), *Federal Register*, Vol. 72, No. 49, p. 11954, March 14, 2007.

numerous populations of exotic plants, the County lands in Subunit 1A not managed by CNLM are not actively managed for exotic species.⁷⁶ Likewise, the small tract of private land in Subunit 1A is assumed to have no ongoing management for exotic species.

Exotic plant species management activities for Thornmint in Subunit 1B are unknown, but assumed to occur as these lands are part of the City of Carlsbad HMP preserve area. As for Subunit 1C, CNLM actively controls for exotic species with herbicides on the portion managed by the entity as a habitat preserve, the mitigation bank.⁷⁷ The extent of exotic species management on the section of Subunit 1C in the private open space easement is unknown, but management of non-native plants is expected to occur when these lands become part of the future Encinitas Subarea Plan preserve area.

4.1.2 UNIT 2

The three subunits within Unit 2 (subunits 2A, 2B, and 2C) that are owned and managed by local governments, differ in their management of exotic plant species, while the privately-owned Subunit 2D is not actively managed for exotic species.

The close proximity of Subunit 2A to urban development makes it especially vulnerable to colonization by exotic plant species. Volunteers from The Friends of Los Peñasquitos Canyon Preserve contribute over 100 labor hours annually on Thornmint conservation projects in the Subunit, including exotic species removal.⁷⁸ In Subunit 2B, despite the likely presence of non-native species, no exotic species management activities are presently occurring.⁷⁹ The Thornmint occurrences in Subunit 2C are threatened by Artichoke Thistle and other exotic species, although the area is not immediately surrounded by urban development.⁸⁰ Volunteers from The Friends of Goodan Ranch assist the County Department of Parks and Recreation with weed removal efforts to protect the Thornmint in this Subunit.⁸¹

⁷⁶ Personal communication with Jessica Vinje, Preserve Manager, Center for Natural Lands Management, April 24, 2007.

⁷⁷ Ibid.

⁷⁸ Personal communication with Gina Washington, Senior Ranger, Los Peñasquitos Canyon Preserve, San Diego Department of Parks and Recreation, May 2, 2007.

⁷⁹ Personal communication with Jim Lyon, Senior Planner, City of Poway, April 26, 2007.

⁸⁰ Personal communication with Maeve Hanley, Resource Management Division, County of San Diego Department of Parks and Recreation, April 26, 2007.

⁸¹ Personal communication with Mike Kelly, Volunteer, Friends of Goodan Ranch, April 27, 2007.

4.1.3 UNIT 3

Exotic plant species are not a major threat to the Thornmint in Unit 3, and USFS does not actively control populations of non-native plants within the Unit.⁸²

4.1.4 UNIT 4

Exotic plant species are not a major threat to the Thornmint on three subunits of Unit 4 on McGinty Mountain (subunits 4A, 4B, and 4C), and none of the landowners actively control populations of non-native plants within these subunits.⁸³ In Subunit 4D, although exotic species do not pose a significant threat to the Thornmint, CDFG still makes limited efforts to control non-native species in the Subunit.⁸⁴

4.2 OVERVIEW OF APPROACH TO ESTIMATING IMPACTS

The analysis of economic impacts related to exotic plant species management on private and public lands is conducted based on information provided by the relevant land managers. When possible, only exotic species management actions specifically related to Thornmint conservation are quantified. However, where this distinction is not possible, it is assumed that the costs are attributable to Thornmint. Also, the value of any volunteer labor used in exotic species removal is quantified using an estimated wage for general labor from the Carlsbad Open Space Management Plan (OSMP).⁸⁵

The analysis does not quantify exotic plant species management impacts on private lands. Because private landowners are not obligated by the Service to take actions to manage or minimize the impact of their activities on plants located on their property, this analysis assumes that private landowners will not voluntarily spend money to prevent or control exotic species on their property to conserve Thornmint populations. Instead, this analysis assumes that exotic species-management on privately-owned land will only occur following the acquisition of private lands by the local HCP. Because annual HCP preserve management costs include management of exotic species, the impacts related to exotic plant species management on private lands are captured in Chapter 2.0, and are not included in this chapter to avoid double-counting.

⁸² Personal communication with Tim Cardoza, Lands and Recreation Officer, Cleveland National Forest, U.S. Forest Service, April 12, 2007.

⁸³ Personal communications with U.S. Fish and Wildlife Service Biologist, San Diego Bay National Wildlife Refuge, April 18, 2007; Zach Principe, The Nature Conservancy, April 1, 2007; and Tim Dillingham, Land Manager, California Department of Fish and Game, April 9, 2007.

⁸⁴ Personal communication with Tim Dillingham, Land Manager, California Department of Fish and Game, April 9, 2007.

⁸⁵ Wage rate of \$22.76 per hour from Carlsbad OSMP for general labor, "Carlsbad OSMP Funding Analysis: Appendix A."

4.3 PAST ECONOMIC IMPACTS

Since the Thornmint was Federally-listed as threatened in 1998, some conservation actions related to exotic species management have been carried out within the Study Area between 1998 and 2007. Details of these actions are presented in this section.

4.3.1 UNIT 1

Since listing of the Thornmint in 1998, all parts of subunits 1B and 1C have been managed for exotic plant species, while only a portion of Subunit 1A has been managed for exotics since 2006. In its efforts to manage the northwest quarter of Subunit 1A, the CNLM took measures to control exotic species threatening the Thornmint. CNLM spends approximately \$200 annually (in 2007 dollars) spraying herbicides to remove exotic species from the Subunit.⁸⁶ The remaining three quarters of Subunit 1A, owned by the County of San Diego, is not managed for exotic species.

Lands within Subunit 1B are part of the City of Carlsbad HMP preserve area and, thus, impacts related to exotic species management on these private lands are captured in the preserve management costs estimated in Chapter 2.0, and are not included in this chapter in order to avoid double-counting.

The CNLM managed mitigation bank, which comprises the majority of Subunit 1C, is surrounded by urban development and is, therefore, vulnerable to exotic species colonization. To combat the threat of Tocalote and other exotic species, CNLM spends approximately \$400 annually (in 2007 dollars) on spraying exotic plants with herbicides.⁸⁷

4.3.2 UNIT 2

Subunit 2A within Unit 2 has been actively managed for exotic plant species since Thornmint listing, while there is no exotic species management in Subunit 2B. Volunteers from The Friends of Goodan Ranch have been actively managing Subunit 2C for exotic species since 2006, when they found out about the preserve's Thornmint population.⁸⁸

In Subunit 2A, located within Los Peñasquitos Canyon Preserve, volunteers have spent approximately 75 hours annually since species listing. These efforts include spraying herbicides and hand weeding to

⁸⁶ Personal communication with Jessica Vinje, Preserve Manager, Center for Natural Lands Management, May, 15, 2007.

⁸⁷ Ibid.

⁸⁸ Personal communication with Mike Kelly, Volunteer, Friends of Goodan Ranch, April 27, 2007.

protect the Thornmint from exotic species.⁸⁹ The time contributed by volunteers to manage exotic species amounts to labor costs of approximately \$1,710 per year (in 2007 dollars).⁹⁰

As a part of the adjacent Goodan Ranch and Sycamore Canyon preserves, Subunit 2C has been managed by the County of San Diego Department of Parks and Recreation since 1991. Since learning of the Thornmint's presence on the preserve in 2006, volunteers from The Friends of Goodan Ranch have spent approximately 16 hours annually managing exotic species within the Subunit. Coupled with an average annual expenditure of \$7.50 for herbicides, this implies that \$370 (in 2007 dollars) worth of exotic species management occurs in Subunit 2C annually.⁹¹

4.3.3 UNIT 3

Most of the subunits in Unit 3 are contained within USFS-managed lands. Exotic plant species do not pose a major threat to the Thornmint on the USFS lands in Unit 3 and, therefore, no management actions are taken to control non-native plant populations within the subunits.⁹²

4.3.4 UNIT 4

Unit 4 is made up of three subunits on McGinty Mountain and one subunit in Hollenbeck Canyon, and the non-private land within the unit is owned by the Service, CDFG, TET, and TNC. Exotic species are not a major threat to Thornmint populations on McGinty Mountain, and none of the aforementioned landowners actively manage for invasive species.⁹³

On Dec. 31, 2001, CDFG acquired a 5,200-acre tract of land in Hollenbeck Canyon, which contains most of Subunit 4D. Since the acquisition, CDFG spends approximately \$150 per year (in 2007 dollars) for controlling exotic plants on these lands.⁹⁴ This analysis assumes that all of CDFG's exotic species management expenditures in Hollenbeck Canyon occur within Subunit 4D to protect the Thornmint.

⁸⁹ Personal communication with Mike Kelly, Volunteer, Friends of Goodan Ranch, April 27, 2007.

⁹⁰ Assumes wage rate of \$22.76 per hour from Carlsbad OSMP for general labor, "Carlsbad OSMP Funding Analysis: Appendix A." Also assumes that 75 of 115 volunteer labor hours spent on the Thornmint are for exotic species management, and the rest are spent on recreation management.

⁹¹ Ibid.

⁹² Personal communication with Tim Cardoza, Assistant Recreation Officer, Cleveland National Forest, U.S. Forest Service, May 9, 2007.

⁹³ Personal communication with: Personal communication with U.S. Fish and Wildlife Service Biologist, San Diego Bay National Wildlife Refuge, April 18, 2007; Zach Principe, The Nature Conservancy, April 1, 2007; and Tim Dillingham, Land Manager, California Department of Fish and Game, April 9, 2007.

⁹⁴ Personal communication with Tim Dillingham, Land Manager, California Department of Fish and Game, April 9, 2007.

Since some of CDFG's efforts to control exotic species likely occur outside the boundaries of the Subunit, this assumption likely results in an overestimation of Thornmint-related exotic species management in Subunit 4D.

4.4 FUTURE ECONOMIC IMPACTS

The non-private landowners and managers are expected to continue implementing the same exotic plant species management activities practiced during the pre-designation period in the future, and at the same rate. Therefore, annual economic impacts are forecast to continue at the same level, approximately \$200 annually in areas proposed for final designation, and \$2,600 annually in areas being considered for exclusion from final critical habitat.

The analysis does not quantify future exotic plant species management impacts on the private lands, which are being considered for exclusion from final critical habitat. As described previously, private landowners are not obligated by the Service to take actions to manage or minimize the impact of their activities on plants located on their property, and this analysis assumes that private landowners will not voluntarily spend money to prevent or control exotic plant species on their property to conserve Thornmint. Instead, this analysis assumes that future exotic species management on the privately-owned lands within the areas being considered for exclusion from final critical habitat will only occur following the acquisition of private lands by one of the HCPs. Because annual HCP preserve management costs include exotic species management, the impacts related to exotic species management on private lands are captured in Chapter 2.0 and are not included in this chapter in order to avoid double-counting.

4.5 SUMMARY OF IMPACTS

Table F-4 in Appendix F provides a summary of impacts related to exotic plant species management that are anticipated to occur (post-designation) due to the proposed final designation. There are no pre-designation (1998 to 2007) impacts associated with exotic plant species management in areas proposed for final designation. Following the designation, approximately \$4,000 in post-designation exotic plant species management impacts are forecast in undiscounted dollars, or \$3,000 and \$2,000 in present value terms at discount rates of three and seven percent, respectively. Expected annualized impacts are estimated at \$200 at both the three and seven percent discount rates. All of the potential post-designation impacts are expected to occur in Subunit 1A and accrue to the County of San Diego.

In areas being considered for exclusion from final critical habitat, the analysis estimates \$23,000 in pre-designation impacts associated with exotic plant species management. Following the designation, approximately \$52,000 in post-designation impacts are forecast in undiscounted dollars, or \$39,000 and \$28,000 in present value terms at discount rates of three and seven percent, respectively. Expected annualized impacts are estimated at \$2,000 at both the three and seven percent discount rates.

4.6 CAVEATS TO ECONOMIC ANALYSIS OF IMPACTS ON EXOTIC PLANT SPECIES MANAGEMENT

Table 4-1 presents the sources of uncertainty regarding impacts on exotic plant species management.

**Table 4-1
Caveats to the Economic Analysis of Impacts on Exotic Plant Species Management**

Key Assumption	Effect on Impact Estimate
All of the exotic plant species management costs incurred by CDFG in Hollenbeck Canyon occur within the proposed Subunit 4D.	+
The Friends of Los Peñasquitos Canyon Preserve spend 75 of the total 115 volunteer Thornmint conservation hours working on exotic plant species management.	+/-

- : 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.

5.1 PERSONAL COMMUNICATIONS

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Personal communication with Betsy Miller, Associate Planner, Multiple Species Conservation Program, City of San Diego, April 16, 2007, May 9, 2007 and May 10, 2007.

Personal communication with Bill Boglin, Park Attendant, April 20, 2007.

Personal communication with Connie Diaz, Development Services Department, City of San Diego, May 30, 2007

Personal communication with Dan Halverson, Planning Department, City of Carlsbad, May 30, 2007;

Personal communication with David de Cordova, Principal Planner, Planning and Building Department, City of Encinitas, April 27, 2007, April 30, 2007, and May 2, 2007.

Personal communication with Erin Miller, Property Assessment Specialist, Systems and Standards Division, San Diego County Assessor's Office, May 25, 2007.

Personal communication with Gina Washington, Senior Ranger, City of San Diego Department of Parks and Recreation, May 2, 2007.

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Personal communication with Jim Lyon, Senior Planner, City of Poway, April 26, 2007 and May 26, 2007.

Personal communication with Maeve Hanley, Program Manager, Resource Management Division/Group, Department of Parks and Recreation, County of San Diego, April 26, 2007 and May 1, 2007.

Personal communication with Melanie Johnson, Biologist, Multiple Species Conservation Program, City of San Diego, April 25, 2007 and May 9, 2007.

Personal communication with Michael W. Reynolds, Developer, Viejas Hills Partners, LLC, April 25, 2007.

Personal communication with Mike Grim, Senior City Planner, City of Carlsbad, April 18, 2007 and May 3, 2007.

Personal communication with Mike Kelly, Volunteer, Friends of Goodan Ranch, April 27, 2007;

Personal communication with Quentin Arvin, Appraiser, General Services, San Diego County, April 30, 2007.

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This appendix presents administrative costs of actions taken under Section 7 of the Act associated with the geographic area proposed as critical habitat for the Thornmint (including areas proposed for final designation and areas being considered for exclusion from final critical habitat under section 4(b)(2) of the Act). First, this Appendix defines the types of administrative costs likely to be associated with the proposed habitat. Next, the Appendix presents estimates of the number of technical assistance efforts and consultations expected to result from the designation of critical habitat and/or the listing of the Thornmint, as well as the per-unit costs of each of these activities. Based on this analysis, estimates of past and future administrative costs are derived.

A.1 CATEGORIES OF ADMINISTRATIVE COSTS

The following section provides an overview of the categories of administrative cost impacts that arise due to the implementation of Section 7 in the geographic area proposed as critical habitat for the Thornmint.

A.1.1 TECHNICAL ASSISTANCE

Frequently, the Service responds to requests for technical assistance from a variety of Federal and state agencies, local municipalities, and private landowners and developers who may have questions regarding whether specific activities may affect species critical habitat. Technical assistance can include a species list provided by the Service, information on listed, proposed, or candidate species, and contact information for people/agencies that can provide further assistance. Technical assistance costs represent the estimated economic costs of voluntary informational conversations between these entities and the Service regarding the designation of critical habitat for the Thornmint. Most likely, such conversations will occur between public land managers or private property owners and the Service regarding lands designated as critical habitat or lands adjacent to critical habitat.

A.1.2 SECTION 7 CONSULTATIONS

Section 7(a)(2) 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. There are two scenarios under which the designation of critical habitat can result in Section 7 consultations with the Service beyond those required by the listing. These include:

- New consultations, which can occur when activities involving a Federal nexus are proposed in critical habitat not thought to be currently occupied and known to be currently occupied by the species; and

- Re-initiations of consultations, which result when consultations that previously occurred under the listing are re-initiated due to the designation.

In some cases, consultations will involve the Service and another Federal agency only, such as the U.S. Forest Service. More often, they will also include a third party involved in projects on non-Federal lands with a Federal nexus, such as state agencies and private landowners.

During a consultation, the Service, the Action agency, and the landowner manager applying for Federal funding or permitting (if applicable) communicate in an effort to reduce or remove adverse effects to the proposed or listed species and/or to the proposed or designated habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, and the potential effects to the species and designated critical habitat associated with the activity that has been proposed, the Federal agency, and whether there is a private applicant involved.

Section 7 consultations with the Service may be either informal or formal. *Informal consultations* consist of discussion between the Service, the Action agency, and the applicant concerning an action that may affect a listed species or its designated critical habitat. The process is designed to identify and resolve potential concerns at an early stage in the planning process. By contrast, a *formal consultation* is required if the Service determines that the proposed action may, or will, adversely affect the listed species or designated critical habitat in ways that cannot be resolved through informal consultation. The formal consultation process results in the Service's determination in its biological opinion (BO) of whether the action is likely to jeopardize a species or adversely modify critical habitat, and recommendations to avoid those impacts and, if the action will result in take of a listed animal species, reasonable and prudent measures to minimize the impacts of such take. Regardless of the type of consultation or proposed project, Section 7 consultations can require substantial administrative effort on the part of all participants.

A.2 ESTIMATED COSTS OF CONSULTATIONS AND TECHNICAL ASSISTANCE

Estimates of the cost of an individual consultation and technical assistance request were developed from a review and analysis of historical Section 7 files from a number of Service field offices around the country conducted in 2002. These files addressed consultations conducted for both listings and critical habitat designations. Cost figures were based on an average level of effort of low, medium, or high complexity, multiplied by the appropriate labor rates for staff from the Service and other Federal agencies.

The administrative cost estimates presented in this section take into consideration the level of effort of the Service, the Action agency, and the applicant, as well as the varying complexity of the consultation or the technical assistance request. Costs associated with these consultations include the administrative costs associated with conducting the consultations, such as the costs of time spent in meetings, preparing letters, and the development of a biological opinion. Table A-1 provides a summary of the estimated administrative costs of consultations and technical assistance requests.

Table A-1
Estimated Administrative Costs of Consultation and Technical Assistance Efforts (per Effort) (in \$2007)

Consultation Type	Service	Action Agency	Third Party	Biological Assessment
Technical Assistance	\$520	N/A	\$1,050	N/A
Informal Consultation	\$2,250	\$2,900	\$2,050	\$2,000
Formal Consultation	\$5,050	\$5,750	\$3,500	\$4,800
Programmatic Consultation	\$15,250	\$12,750	N/A	\$5,600

Source: Industrial Economics, Inc., analysis based on data from the Federal Government General Schedule Rates, Office of Personnel Management, 2006, and a review of consultation records from several Service field offices across the country.

A.3 SUMMARY OF PAST ADMINISTRATIVE COSTS

The Section 7 consultation history of the Thornmint includes two BOs, both on applications to the U.S. Army Corps of Engineers (ACOE) to discharge fill material associated with developments near the Thornmint Study Area (see Table A-2). The BOs suggest measures that will limit the impact of development activities to Thornmint and other sensitive species. The Section 7 consultation history also contains three technical assistance/information request consultations, which comment on reports submitted to the Service. Two of the comments are on draft impact reports for housing developments, while the third one is on a Mitigated Negative Declaration for a residential development. Because none of the Section 7 consultations are related to the geographic location of the Study Area, the EA will not quantify the administrative impact associated with these historic Section 7 consultations.

A.4 SUMMARY OF FUTURE ADMINISTRATIVE COSTS

One programmatic Section 7 consultation is anticipated between 2008 and 2027 in the Study Area for the Thornmint. The programmatic consultation is expected to occur in 2010, and involves the East County MSCP. As described in Section 1.4, HCPs do not grant incidental take permits for plant species. However, if a listed plant occurs in an area subject to the HCP, the Service must consider whether the proposed activities may adversely affect or jeopardize the continued existence of the plant. While the Thornmint will benefit from protective measures provided by the future East County MSCP, the development of the MSCP involves the evaluation of more than 250 species with no information available for allocating a portion of MSCP costs to Thornmint (see Section C.3). Therefore, this analysis does not allocate the Section 7 consultation cost related to the East County MSCP to the Thornmint.

**Table A-2
Section 7 Consultation History for Thornmint**

Service Log #	Date	Action Agency	Critical Habitat Subunit	Project Description	Species and Habitat Conservation
Formal Consultations					
1-6-02-F-2124	02/13/03	ACOE	n/a	BO on the application to ACOE for a permit to discharge fill material, associated with the construction of an industrial park, into a tributary of Agua Hedionda Creek. The project would develop 112 acres of a 145-acre parcel, including two roads.	A survey of the site by Helix Environmental Planning found no occurrences of Thornmint despite documented historical occurrences. Hence, Thornmint was not addressed in the consultation. Still, conservation measures were incorporated to avoid or otherwise minimize potential adverse effects of the action on sensitive and listed species including: (1) An eventual 48.85 acres of open space onsite; (2) Manufactured slopes vegetated with coastal sage scrub; and (3) Additional conservation efforts targeting the endangered California gnatcatcher.
1-6-03-F-2820	Undated, appears to be post-12/20/02	ACOE	n/a	BO on the application to ACOE for a permit to discharge fill material from housing development construction into a tributary of the San Louis Rey River in Oceanside, California. The development would construct 28 houses on a 30.09-acre residentially zoned parcel. The development would not directly remove the 185 individual Thornmint plants observed on the site.	Approved project included: (1) Preserving 14.5 acres of the site as open space; (2) Securing conservation easements to assure the long-term conservation of select on- and off-site areas; (3) Hiring a natural lands management company to ensure conservation of the site's biological resources; (4) Creating 0.23 acres of wetland habitat contiguous with the wetland onsite; (5) Acquiring and managing 3.4 acres of native grassland off-site within the MHCP; (6) Preparing an educational document for future residents, explaining the sensitivity of the neighborhood's biological resources; (7) Separating the on-site housing from the housing with a fence; (8) Banning fuel modification outside project footprint; (9) Monitoring construction by a biologist to protect sensitive species; (10) Prohibiting the use of invasive plants in landscaping; and (11) Implementing environmentally sensitive construction practices (erosion control, clear boundaries, etc.).

Service Log #	Date	Action Agency	Critical Habitat Subunit	Project Description	Species and Habitat Conservation
Technical Assistance/Information Request					
882.5	04/19/06	Service	n/a	Comments on the Draft Environmental Impact Report (EIR) from the city of Chula Vista for implementation of the Otay Ranch sectional planning area plan for villages 2, 3, and a portion of village 4. Involves the development of 2,786 dwelling units and community facilities, such as parks, a swimming pool, and an elementary school. Thornmint was identified on-site.	Activities proposed in EIR include: (1) Landowner conveyance of 1.188 acres to the Otay Ranch Resource Management Plan (RMP) for each acre developed or payment of an in-lieu fee; (2) Construction of fencing by landowners along the boarders of the preserve; and (3) Monitoring of all vegetation clearing by a biologist.
2380.1	11/15/02	Service	n/a	Comments on the Notice of Preparation for a Draft Environmental Impact Report (EIR) for the Cantarini and Holly Springs projects. The Holly Springs project includes the construction of 43 homes, an 80-unit apartment complex, and 5,000 feet of residential streets. The Cantarini project includes the construction of 105 homes, an 80-unit apartment complex, and 10,000 feet of residential streets.	The Service suggests that a detailed survey be undertaken to determine if Thornmint is present within the proposed site before completing the Draft EIR.
3458.1	11/27/01	Service	n/a	Comments on the Mitigated Negative Declaration (MND) for the Emerald Point estates project in Carlsbad, California. The project would construct 14 single family homes on an 18-acre site, approximately 1.5 miles from critical habitat subunit 1A. The MND indicates that 10.3 acres would be preserved in an open space easement. A survey of the site revealed 150 to 200 individual Thornmint plants occupying 0.03 acre.	The Service and CDFG offer the following suggestions: (1) Providing greater detail on the mechanisms mitigating the hydrological impacts to the Thornmint population located down slope from proposed landscape irrigation; (2) Specifying an appropriate conservation entity and funding source to manage the conservation easement; (3) Installation of permanent fencing between the open space and impact area; and (4) Making efforts to use native plants in community landscaping.

A.4 SUMMARY OF IMPACTS

No pre-designation administrative costs are attributable to the Thornmint within the Study Area, and no post-designation administrative costs are allocated. Because two-thirds of the Study Area for Thornmint is, or may be, covered by two subregional HCPs and three approved subarea plans created under the guidance of the subregional HCPs, and most of the remaining one-third of the Study Area is protected under the Southern California Forest Plan, which includes the Cleveland National Forest (subunits 3B, 3C, 3D, 3E, and 3F) and three other California national forests (Angeles, Los Padres, and San Bernardino), Section 7 consultations are not anticipated. This estimation is supported by the fact that no Section 7 consultations have taken place on activities occurring within the Study Area during the nine years since listing of the Thornmint.

A.5 CAVEATS

The number of consultations and technical assistance efforts to be undertaken in the future for activities within a given complex is highly uncertain. The frequency of such efforts will be related to the level of economic activity, the presence of HCPs or other regional plans, and the extent to which economic activity overlaps with critical habitat. To the extent that this analysis over or underestimates the number of these efforts in the future, estimated costs will be over or understated.

This appendix considers the extent to which the impacts discussed in the main report could be borne by small businesses and the energy industry. The analysis presented in Section B.1 is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. Information for this analysis was gathered from the Small Business Administration (SBA), U.S. Census Bureau, San Diego Association of Governments (SANDAG), San Diego County Assessor's Office, The Nature Conservancy (TNC), and Center for Natural Lands Management (CNLM). The energy analysis in Section B.2 is conducted pursuant to Executive Order No. 13211.

B.1 IMPACTS TO SMALL ENTITIES

When a Federal agency proposes a regulation, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).⁹⁵ No Initial Regulatory Flexibility Analysis (IRFA) is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities. To assist in this process, this appendix provides a screening level analysis of the potential for Thornmint conservation efforts to affect small entities.

B.1.1 SUMMARY OF IMPACTS ON SMALL ENTITIES

This screening analysis is based on the estimated impacts associated with the proposed rulemaking as described in chapters 2 through 4 of this analysis. The analysis evaluates the potential for economic impacts related to several categories, including: (1) development; (2) recreation; and (3) exotic plant species management. As summarized below and presented in more detail in Section B.1.2, only a small number of private landowners are anticipated to be affected by conservation efforts for the Thornmint.

- A portion of the funding for species conservation under the HCPs (see Chapter 2.0) encompassing the Study Area, as well as costs associated with modifications to activities on State and Federal lands, including recreation management (see Chapter 3.0) and exotic plant species management (see Chapter 4.0), will be borne by the State and Federal government agencies. These agencies are the California Department of Fish and Game (CDFG), U.S. Forest Service (USFS), and U.S. Fish

⁹⁵ 5 U.S.C. 601 et seq.

and Wildlife Service (Service). The State and Federal governments are not considered small entities by the SBA.

- Recreation management and exotic plant species management are also expected to be carried out by TNC, CNLM, the County of San Diego, and the City of San Diego, and are not anticipated to impact small entities.
- Following the HCP funding structure described in Appendix C, this analysis estimates that development impacts in the Study Area will be borne by the County of San Diego, State and Federal governments, private landowners, including homeowners’ associations (HOAs), and the cities of San Diego and Poway. As described previously, the County, City, State, and Federal governments are not considered small entities by the SBA. This screening analysis, therefore, focuses on economic impacts resulting from conservation activities carried out by private landowners on the affected private parcels in the Study Area.

Table B-1 summarizes the estimated impacts to small entities (i.e., private landowners) in the Study Area as described in detail in the remainder of this appendix.

**Table B-1
Summary of Impacts to Small Entities in the Study Area⁹⁶**

Activity	Total Number of Affected Small Entities	Estimated Average Impact per Small Entity
Development in areas proposed for final designation	2 private landowners	29.3 acres
		\$39,300 – \$314,500 over 20 years
		\$2,700 – \$21,200 annualized
Development in areas being considered for exclusion from final critical habitat	7 private landowners	14.3 acres
		\$37,300 – \$180,000 over 20 years
		\$2,400 – \$12,000 annualized

B.1.2 DETAILED ANALYSIS OF IMPACTS TO SMALL ENTITIES

The Act requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable. Section 4(b)(2) of the Act requires that the Service designate critical habitat “on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts, of specifying any

⁹⁶ Results are provided using discounted impacts using a three percent discount rate.

particular area as critical habitat.” This section grants the Secretary [of Interior] to exclude any area from critical habitat if (s)he determines “the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat”. The Secretary's discretion is limited, as (s)he may not exclude areas if so doing “will result in the extinction of the species.”

Three types of small entities are defined in the RFA:

- **Small Business** - Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under Section 3 of the Small Business Act. This includes any firm that is independently owned and operated, and is not dominant in its field of operation. The SBA has developed size standards to carry out the purposes of the Small Business Act, and those standards can be found in 13 CFR 121.201. The size standards are matched to North American Industry Classification System (NAICS) industries. The SBA definition of a small business applies to a firm's parent company and all affiliates as a single entity.
- **Small Governmental Jurisdiction** - Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, since they are not typically classified by population.
- **Small Organization** - Section 601(4) defines a small organization as any not-for-profit enterprise that is independently owned and operated, and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc. Depending upon state laws, it may be difficult to distinguish whether a small entity is a government or non-profit entity. For example, a water supply entity can be a cooperative owned by its members in one case, while in another, it may be a publicly-chartered small government with the assets owned publicly and officers elected at the same elections as other public officials.

The courts have held that the RFA/SBREFA requires Federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy Regulatory Commission (FERC)*, FERC proposed regulations affecting the manner in which generating utilities incorporated in progress construction work into their rates. The generating utilities expected to be regulated were large businesses; however, their customers – transmitting utilities such as electric cooperatives – included numerous small entities. In this case, the court agreed that FERC simply authorized large electric generators to pass these costs along to their

transmitting and retail utility customers, and FERC could, therefore, certify that small entities were not directly affected within the definition of the RFA.⁹⁷

Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency* (EPA) addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and particulate matter.⁹⁸ The basis of EPA's RFA/SBREFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of state plans that incorporated the standards. The court found that, while EPA imposed regulation on states, it did not have authority under this rule to impose regulations directly on small entities and, therefore, small entities were not directly affected within the definition of the RFA.

The SBA, in its guidance on how to comply with the RFA, recognizes that consideration of indirectly affected small entities is not required by the RFA, but encourages agencies to perform a regulatory flexibility analysis even when the impacts of its regulation are indirect.⁹⁹ “If an agency can accomplish its statutory mission in a more cost-effective manner, the Office of Advocacy (of the SBA) believes that it is good public policy to do so. The only way an agency can determine this is if it does not certify regulations that it knows will have a significant impact on small entities even if the small entities are regulated by a delegation of authority from the federal agency to some other governing body.”¹⁰⁰

The regulatory mechanism through which critical habitat protections are enforced is Section 7 of the Act, which directly regulates only those activities that are carried out, funded, or permitted by a Federal agency. By definition, Federal agencies are not considered small entities, although the activities they fund or permit may be proposed or carried out by small entities. Given the SBA guidance described in the preceding paragraph, this screening analysis considers the extent to which this designation could potentially affect small entities, regardless of whether these entities would be directly regulated by the Service through the proposed rule or by a delegation of impact from the directly regulated entity. The small entities described in this appendix are not considered to be directly regulated by the Service through Section 7.

This screening analysis focuses on small entities that may bear the regulatory costs quantified in chapters 2.0 through 4.0 of this economic analysis. Of the affected activities discussed in the economic analysis, only impacts to land development (see Chapter 2.0) activities are forecast to be borne by individual private landowners. As previously described in Section B.1.1, the screening analysis will focus on economic impacts resulting from modifications to development activities in the Study Area. While it is

⁹⁷ 773 F. 2d 327 (D.C. Cir. 1985).

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

⁹⁹ Small Business Administration, Office of Advocacy, May 2003, “A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act,” p. 20.

¹⁰⁰ *Ibid.*, p. 21.

unknown whether these private landowners qualify as small businesses, the economic impacts to these private landowners are addressed in this small business impacts analysis.

B.1.2.1 Small Governments

The boundaries of three city governments encompass the Study Area: Carlsbad (estimated population in 2006 of 98,607), Encinitas (estimated population in 2006 of 62,815), and San Diego (estimated population in 2006 of 1,311,162). A small portion of Subunit 2B is also owned by the City of Poway (estimated population in 2006 of 50,542). The remainder of the Study Area is located in unincorporated San Diego County (estimated population in 2006 of 442,667, or 2,947,454 for the entire County in 2006).¹⁰¹ All four cities, as well as the County, exceed the criteria (service population of 50,000 or less) for “small entity” under the RFA, and are not considered in this small business impact analysis.

B.1.2.2 Small Organizations

Two non-profit organizations, TNC¹⁰² and CNLM,¹⁰³ are involved in species conservation activities within the Study Area. Considering the missions of these organizations are to preserve, restore, and protect natural resources, including the species and their habitats, the impact of species conservation activities on these organizations is not considered in this small business impacts analysis.

B.1.2.3 Number of Small Entities to which the Proposed Rule will Apply

This analysis estimates that nine individual landowners in the Study Area may be affected by future conservation efforts for the Thornmint. Whether these landowners qualify as small businesses is unknown. Two private landowners and four parcels (58.5 affected acres) can potentially be impacted by

¹⁰¹ San Diego Association of Governments, Current Estimates (2006), Data and Profile Warehouse, <http://profilewarehouse.sandag.org/>, accessed May 25, 2007.

U.S. Census Bureau, American FactFinder, “2006 Population Estimates: San Diego County,” http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=PEP&_submenuId=datasets_3&_lang=en, accessed May 25, 2007.

¹⁰² The mission of TNC “...is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive,” <http://nature.org/aboutus/>, accessed May 25, 2007.

¹⁰³ The mission of the CNLM “...is: (a) to conserve native species, their habitat and functioning ecosystems in perpetuity; (b) to own and/or manage lands in an ecologically beneficial manner consistent with local, state and federal environmental laws and with science-based stewardship; (c) to promote the conservation values of such lands through education; (d) to promote and facilitate uses of such lands by the public that preserve the conservation values; and (e) to cooperate with public and private entities in their efforts to protect native species and their habitats for the public benefit,” http://www.cnlm.org/cms/index.php?option=com_content&task=view&id=108&Itemid=153, accessed May 25, 2007.

the proposed final designation. One landowner owns three affected parcels, one in Subunit 3D (50.0 affected acres) and two parcels in Subunit 3F (6.8 affected acres), while the other landowner owns one affected parcel in Subunit 3C (1.7 affected acres). Seven private landowners and 14 parcels (99.7 affected acres) are impacted in the areas being considered for exclusion from final critical habitat (see Table B-2).

Table B-2
Summary of Impacts to Private Landowners in the Study Area

Landowner #	Subunit	Affected Parcels	Affected Acres	Total Economic Impact	Annualized Economic Impact
Areas Proposed for Final Designation					
1	3C	1	1.7	\$12,300 - \$98,700	\$700 - \$6,700
2	3D & 3F	3	56.9	\$66,300 - \$530,300	\$4,700 - \$35,700
Total		4	58.6	\$78,700 - \$629,000	\$5,300 - \$42,300
Areas Being Considered for Exclusion from Final Critical Habitat					
3	1A & 1C	4	7.4	\$41,000 - 234,000	\$2,000 - \$15,000
4	1B	1	2.9	\$116,000 - \$192,000	\$8,000 - \$13,000
5	2C	2	29.7	\$34,700 - \$277,000	\$2,300 - \$18,700
6	3A	2	6.4	\$7,500 - \$60,000	\$500 - \$4,000
7	3A	1	25.6	\$29,800 - \$238,400	\$2,100 - \$16,000
8	4C	1	4.9	\$5,700 - \$46,000	\$300 - \$3,000
9	4D	3	22.8	\$26,700 - \$212,300	\$1,700 - \$14,300
Total		14	99.7	\$261,300 - \$1,259,700	\$17,000 - \$84,000

Numbers may not sum due to rounding.

Results (total and annualized economic impacts) are provided using discounted impacts and a three percent discount rate.

In sum, this analysis estimates that species conservation activities would be incurred by 18 privately-owned, undeveloped parcels in the Study Area. These parcels are owned by 9 different private landowners.¹⁰⁴ Compared to the number of parcels of land in San Diego County (954,156),¹⁰⁵ the 18 affected parcels represent a small percentage of all land parcels (less than 0.002 percent) in the Study Area (San Diego County). While the number of individual landowners in the County is not known, the nine affected private landowners also likely represent a small percentage of all landowners in the County.

¹⁰⁴ This number excludes the two parcels in Subunit 2B, owned by the cities of Poway and San Diego.

¹⁰⁵ As of 2006, there were 954,156 tax parcels of land in San Diego County. Personal communication with Erin Miller, Property Assessment Specialist, Systems and Standards Division, San Diego County Assessor's Office, May 25, 2007.

B.1.2.4 Economic Impact of Compliance Requirements on Small Entities¹⁰⁶

The nine landowners expected to be affected are forecast to experience an annualized impact that ranges from a low of \$300 to \$8,000 to a high of \$3,000 to \$35,700, with an average range of annualized impact of \$2,500 to \$14,000 per landowner (see Table B-2).

The affected area within the 18 parcels totals 158 acres, and ranges from 0.7 acres to 50.0 acres per parcel, or an average of 8.8 acres per parcel. In terms of affected landowner, the acre impact ranges from 1.7 acres to 50.7 acres per landowner, or an average of 17.6 acres per landowner. The total economic impact for these nine landowners over the next 20 years ranges between \$261,300 and \$1,259,700 for the initial costs of setting up their portions of the preserve area (i.e., the lost development value on their lands) and the annual program costs (monitoring, maintenance, and administration) under the HCPs, or between \$17,000 and \$84,000 annualized. Individually, the range of total economic impact over the next 20 years ranges from a low of \$5,700 to \$116,000 to a high of \$46,000 to \$530,300, with an average range of impact equaling \$37,800 to \$209,900 per landowner. In terms of annualized economic impacts, it ranges from a low of \$300 to \$8,000 to a high of \$3,000 to \$35,700, with an average range of \$2,500 to \$14,000 per landowner.

- The total estimated post-designation impact to the two private landowners in the areas proposed for designation range from a low of \$12,300 to \$66,300 to a high of \$98,700 to \$530,300, with an average range of impact equaling \$39,300 to \$314,500 per landowner. In terms of annualized economic impacts, it ranges from a low of \$700 to \$4,700 to a high of \$6,700 to \$35,700, with an average range of \$2,700 to \$21,200 per landowner.
- The total estimated post-designation impact to the seven private landowners in the areas being considered for exclusion from final critical habitat range from a low of \$5,700 to \$116,000 to a high of \$46,000 to \$277,000, with an average range of impact equaling \$37,300 to \$180,000 per landowner. In terms of annualized economic impacts, it ranges from a low of \$300 to \$8,000 to a high of \$3,000 to \$18,700, with an average range of \$2,400 to \$12,000 per landowner.

While it is unknown whether these nine landowners qualify as small businesses, economic impacts are not anticipated even if the landowners were to represent small development businesses (e.g., land subdivision and construction businesses). Considering the strong population growth in the unincorporated portions of San Diego County and the cities of Carlsbad and Encinitas, and the strong regional housing market, any developer directly impacted by the regulation is not expected to bear the additional cost of Thornmint conservation. This additional cost is anticipated to be passed along to the purchaser of the finished building if the undeveloped lands are developed.

¹⁰⁶ Results are provided using discounted impacts using a three percent discount rate.

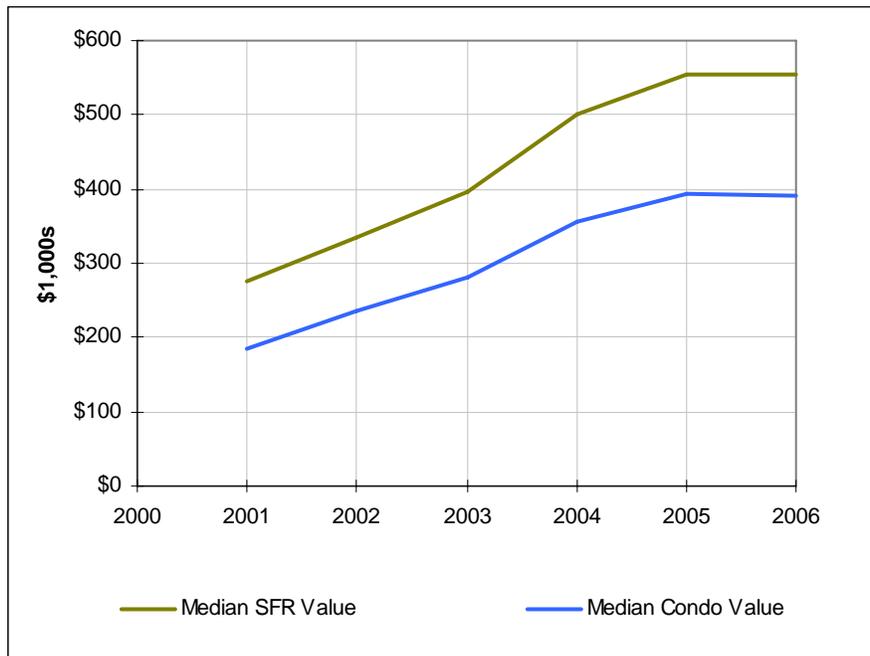
The Study Area is encompassed by unincorporated portions of San Diego County and the cities of San Diego, Carlsbad, and Encinitas. The population in the unincorporated portions of San Diego County has grown steadily since 1990 (population in 2006 of 442,667), increasing by 17 percent between 1990 and 2006.¹⁰⁷ In recent years (2000 to 2006), unincorporated San Diego County's population increased by 5.2 percent. Of the three cities, Carlsbad shows the greatest growth since 1990 (population in 2006 of 98,607), increasing by nearly 57 percent between 1990 and 2006. In recent years (2000 to 2006), Carlsbad's population increased by 26.0 percent. Carlsbad is followed by the City of San Diego, which saw an 18 percent increase in population since 1990 (2006 populations estimated at 1,311,162) with a slower growth during recent years (18 percent during the period from 1990 to 2000 and seven percent between 2000 and 2006). The population of Encinitas has also grown in the past decade and a half, increasing 13 percent since 1990 (2006 population estimated at 62,815) with more rapid growth during recent years (four percent during the period from 1990 to 2000 and 8.3 percent between 2000 and 2006).

The fast pace of population growth has had a considerable impact on the housing market in the region. In fact, median single family residence (SFR) and condominium prices (\$554,000 and \$390,000, respectively, in 2006) in the County have increased by 102 and 110 percent, respectively, between 2001 and 2006 (see Figure B-1).¹⁰⁸ Given the strong demand for housing, if the private landowners were to represent small development businesses, they would be expected to pass on the additional cost of Thornmint conservation to the purchaser of the finished building.

¹⁰⁷ San Diego Association of Governments, "1990 Census, Population and Housing Profile," Data and Profile Warehouse, <http://profilewarehouse.sandag.org/>, accessed October 8, 2007.

¹⁰⁸ "Southern California Home Sale Activity, L.A. Times Sunday Edition Charts – Data for the Year 2006," available at DataQuick Real Estate News, <http://www.dqnews.com/ZIPLAT2006.shtm>, accessed May 25, 2007.

**Figure B-1
Median Residential Home Values, County of San Diego**



B.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

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.”¹⁰⁹

The Office of Management and Budget (OMB) provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute “a significant adverse effect” when compared with the regulatory action under consideration:

- Reductions in crude oil supply in excess of 10,000 barrels per day;
- Reductions in fuel production in excess of 4,000 barrels per day;
- Reductions in coal production in excess of five million tons per year;
- Reductions in natural gas production in excess of 25 million cubic-feet (Mcf) per year;

¹⁰⁹ Office of Management and Budget, 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, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>, accessed July 31, 2001.

- Reductions in electricity production in excess of one billion kilowatt-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.¹¹⁰

As none of these criteria is relevant to this analysis, energy-related impacts associated with conservation efforts within the Study Area are not anticipated.

¹¹⁰ Ibid.

The proposed critical habitat units are located within the County of San Diego, California, and are affected by three of the area's Habitat Conservation Plans (HCPs). These include the approved South County Multiple Species Conservation Program (MSCP) and the Multiple Habitat Conservation Program (MHCP) (South County MSCP), and the contemplated East County MSCP. The two completed plans, as well as the one contemplated plan are expected to serve as "umbrella documents" that guide local jurisdictions in creating subarea plans for preserve design, habitat and species criteria, and management and monitoring criteria. The proposed critical habitat units are also located within the jurisdictions of four subarea plans: the approved City of San Diego MSCP Subarea Plan, the County of San Diego MSCP Subarea Plan, and the City of Carlsbad Habitat Management Plan (HMP), and the unapproved City of Encinitas Subarea Plan (see Figure C-1).¹¹¹ This section describes each "umbrella" plan, as well as their subarea plans that affect the proposed critical habitat units.

C.1 THE SOUTH COUNTY MULTIPLE SPECIES CONSERVATION PROGRAM

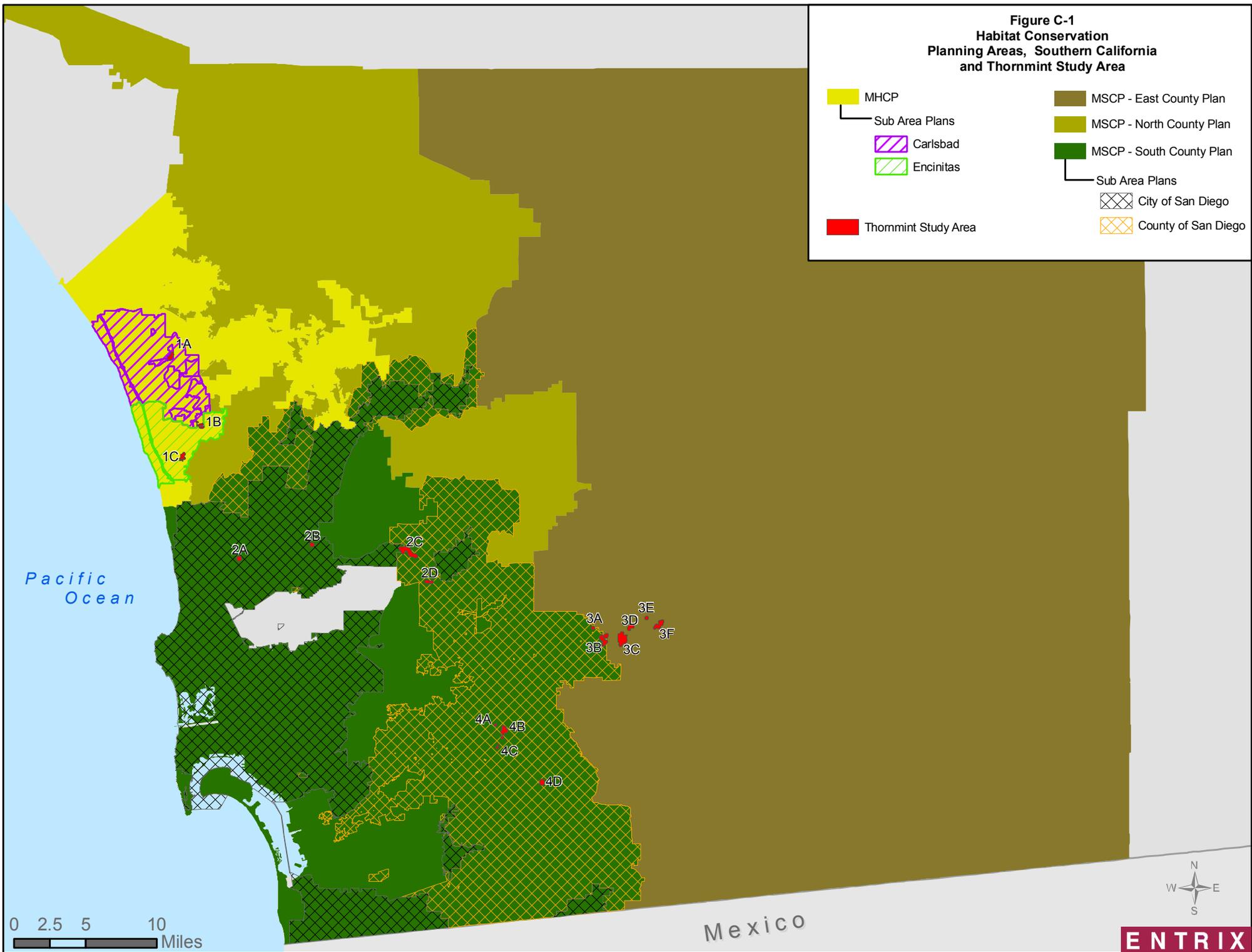
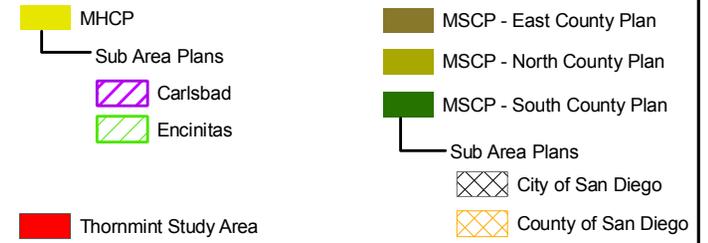
The South County MSCP was the first comprehensive HCP in San Diego County. Completed in 1997, the purpose of the Plan is to provide for the protection of the wide range of rare, threatened, and endangered species in San Diego County, while accommodating economic development in the region at the same time. A total of 85 species are covered under the Plan,¹¹² 21 of which are Federally-listed as threatened or endangered, or proposed for Federal listing.¹¹³ Through approved subarea plans implemented by participating jurisdictions and San Diego County, the South County MSCP serves as an HCP pursuant to section 10(a)(1)(b) of the Endangered Species Act (Act), as well as a Natural Community Conservation Plan (NCCP) pursuant to the California Natural Community Conservation Planning Act of 1991.

¹¹¹ As of the writing of this report, the City of Encinitas is yet to approve its Subarea Plan (estimated to be in effect by 2008), while the East County MSCP is only in its early stages of planning (estimated to be in effect by 2010). Personal communications with David de Cordova, Principal Planner, City of Encinitas, May 2, 2007, and Thomas Oberbauer, Chief, MSCP Division, Department of Planning and Land Use, County of San Diego, May 14, 2007.

¹¹² Northwest Economic Associates, 2005, "Economic Analysis of Critical Habitat Designation for the Spreading Navarretia."

¹¹³ Ibid.

Figure C-1
Habitat Conservation
Planning Areas, Southern California
and Thornmint Study Area



The South County MSCP Study Area covers approximately 582,243 acres in the southwestern portion of San Diego County, encompassing 12 participating jurisdictions including unincorporated areas of the County. In the south, the South County MSCP Study Area is bounded by the U.S./Mexican border, while being bordered by unincorporated areas of San Diego County in the east, comprised mainly of national forest land. The Pacific Ocean borders the Study Area in the west and the San Dieguito River Valley is adjacent to its northern boundary.

Just over half of the South County MSCP Study Area, 315,940 acres, is inhabited by various vegetation communities. The South County MSCP identifies eight major populations of Thornmint and calls for an 85 percent conservation level for the species, although the County of San Diego Subarea Plan increases this conservation level to 94 percent.¹¹⁴

As a subregional plan, the South County MSCP acts as an “umbrella document” for jurisdictions formulating subarea plans. Conservation for covered species is accomplished through conservation measures for a 171,917 acre preserve system within the 194,318-acre Multiple Habitat Planning Area (MHPA). Each jurisdiction participating in the South County MSCP implements a portion of the MHPA preserve system. Additionally, because the South County MSCP designated Thornmint as a “Narrow Endemic Species,” each subarea plan is required to develop additional conservation measures to protect it.¹¹⁵

As an “umbrella” document, the South County MSCP calls for subarea plans to be developed by the local governments. These subarea plans are required to address the following:¹¹⁶

- Type and location of resources to be protected;
- Sensitivity to disturbance of the species to be protected;
- Type of vegetation and topography;
- Type and intensity of land uses and cumulative impacts of a combination of uses; and
- Type and intensity of human activity adjacent to the preserve.

¹¹⁴ San Diego County, 1998, *Multiple Species Conservation Program (MSCP), Final*, Section 3.6 “Biological Preserve Design Checklist.”

County of San Diego, 2003, *Multiple Species Conservation Program Subarea Plan*, Section 1.2.2 “Anticipated Conservation Levels for Species in the County Subarea.”

¹¹⁵ Northwest Economic Associates, 2005, “Economic Analysis of Critical Habitat Designation for the Spreading Navarretia.”

San Diego County, 1998, *Multiple Species Conservation Program (MSCP), Final*, Section 3.2 “Habitats Conserved.”

¹¹⁶ Ibid, Section 6.1 “Role of Subarea Plans in Land Use Compatibility and Preserve Management.”

Within the South County MSCP Subregional Area, proposed Thornmint habitat is covered by two subarea plans: the City of San Diego Subarea Plan and the County of San Diego Subarea Plan. These are described below.

C.1.1 THE CITY OF SAN DIEGO MSCP SUBAREA PLAN

The City of San Diego Subarea Plan was completed in 1997 at a cost of between \$6 and \$7 million during the course of seven years (1991 to 1997).¹¹⁷ The Plan encompasses the incorporated areas of the City of San Diego and a small portion of the unincorporated areas in San Diego County owned by the City, and covers all 85 species identified by the South County MSCP.¹¹⁸ Approximately 206,124 acres in the South County MSCP Study Area are contained within the jurisdiction of City of San Diego Subarea Plan, which is characterized mainly by urban land use. The City of San Diego Subarea Plan MHPA is 56,831 acres, making up 29 percent of the South County MSCP MHPA.

The City of San Diego Subarea Plan also outlines land uses that are allowed within the MHPA, as well as major issues for habitat management in areas containing Thornmint populations. The allowed land uses include passive recreation, utility lines and roads (subject to certain restrictions), limited water and other public facilities, limited low density residential uses, brush management, and limited agriculture.¹¹⁹

C.1.1.1 Thornmint Subunits

Two proposed critical habitat subunits, 2A and 2B, lie within the jurisdiction of the City of San Diego Subarea Plan. Subunit 2A is located in the Peñasquitos Canyon Preserve, and is owned by the City of San Diego. This Subunit was added to the MHPA on March 1, 1997, prior to the listing of the species. Subunit 2B is owned by the City of San Diego and the City of Poway. The City of Poway's land within the Subunit is the site of an old wastewater treatment plant that has been removed. Most of the San Diego and Poway land within the Subunit has been preserved, and was added to the MHPA on March 17, 1997, prior to the listing of the Thornmint. The actual location where the wastewater treatment plant's structures once stood has not been preserved, as it was previously not considered to be of sufficient quality to provide habitat for any species. However, on February 14, 2003, after the listing of the species, a portion of the previously unpreserved wastewater treatment plant land was added to the preserve, and

¹¹⁷ Personal communication with Betsy Miller, Associate Planner, Multiple Species Conservation Program, City of San Diego, May 10, 2007.

¹¹⁸ City of San Diego, 1997, *Multiple Species Conservation Program Subarea Plan*, Section 1.3 "Covered Species List."

¹¹⁹ City of San Diego, 1997, *Multiple Species Conservation Program Subarea Plan*, Section 1.4.1 "Compatible Land Uses."

the City of Poway is planning to transfer all of its land in the vicinity of the Subunit to the City of San Diego in a land exchange, although it is unclear when the exchange will be completed.¹²⁰

C.1.1.2 Thornmint Conservation

The City of San Diego Subarea Plan divides the City's MHPA into five general areas, with area-specific management guidelines. These areas are: 1) Southern; 2) Eastern; 3) Urban; 4) Northern; and 5) Cornerstone Land and San Pasqual Valley. Habitat management within the areas that include, among other species, Thornmint, focuses on the following issues (although all of these may not occur in subunits 2A and 2B):¹²¹

1. Intense land uses and activities adjacent to and within covered species habitat and linkages;
2. Off-road vehicle activity;
3. Dumping litter and vandalism;
4. Enhancement and restoration needs;
5. Exotic (non-native) invasive plants and animals;
6. Illegal immigration and border patrol activities;
7. Utility, facility, and road repair, construction, and maintenance activities;
8. Encroachment from existing development; and
9. Water drainage issues, including water quality, urban runoff, erosion, sedimentation, and flood control.

While subunits 2A and 2B are both in the Northern Area, Thornmint populations are identified within three of the areas: Southern, Eastern, and Northern. The following are area-specific guidelines within the three areas that contain Thornmint populations.¹²²

1. Maintain and/or provide trail access for border patrol use around the rim of canyons, where feasible. Motorized off-road vehicle use in the MHPA should be prohibited, except by border patrol, MHPA preserve managers, or emergency vehicles.

¹²⁰ Personal communication with Jim Lyon, Senior Planner, City of Poway, May 26, 2007.

¹²¹ City of San Diego, 1997, *Multiple Species Conservation Program Subarea Plan*, Section 1.2 "Description of Subarea" and Section 1.5 "Framework Management Plan."

¹²² City of San Diego, 1997, *Multiple Species Conservation Program Subarea Plan*, Section 1.2 "Description of Subarea."

2. In the area south of the proposed State Route 905 (SR-905), minimize road crossings of Spring Canyon. Where road crossings must occur, use bridges or culverts. Manufactured slopes adjacent to roadways should be revegetated with appropriate native vegetation.
3. Unless noted otherwise, culvert dimensions should be at least 30 feet wide by 15 feet high and, where feasible, have a maximum 2:1 length-to-width ratio. The floor of the culvert must be natural/soft bottom and the ceiling constructed using skylights, where possible, to provide adequate visibility for wildlife.

Following the guidance of the South County MSCP, the City of San Diego Subarea Plan calls for 85 percent Thornmint habitat conservation. However, because Thornmint is designated as a “narrow endemic species” by the South County MSCP, the City of San Diego Subarea Plan includes additional conservation measures. In fact, all impacts to such a species within the MHPA are to be avoided. In such instances where a “narrow endemic species” occurs outside the MHPA, the species is to be “...protected through the following measures, as deemed appropriate: 1) avoidance; 2) management; 3) enhancement; and/or 4) transplantation to areas identified for preservation.”¹²³

Conservation for the species also includes active monitoring. Transects were created within the habitat in order to inventory the Thornmint populations and information regarding the plant and the conditions around it are gathered in these transects annually.

C.1.1.3 Thornmint Conservation Costs and Funding

Although the City of San Diego Subarea Plan manages for the issues described in Section C.1.1.2, the specific regional funding mechanism contemplated under the MSCP to finance the monitoring and management is not in place.¹²⁴ Because of this, not all of the monitoring and management contemplated under the plan has been put into place, and those measures that are in place have been funded through grants and the City’s General Fund. For the purpose of this report, annual pre-designation City of San Diego Subarea Plan monitoring, management, and administrative costs are based on historic information provided by the South County MSCP (\$38 per acre per year).¹²⁵

- According to the South County MSCP, each public landowner within the preserve area is responsible for managing his own land. The City-owned land in subunits 2A and 2B are managed by the City of San Diego Parks and Recreation Department, with current management activities in Subunit 2A

¹²³ Ibid, Section 1.6.4 “Conservation Estimates.”

¹²⁴ The process for establishing a regional funding source was to occur within 18 – 36 months after the Federal and state approvals of the City of San Diego Subarea Plan.

¹²⁵ Personal communication with Betsy Miller, Associate Planner, Multiple Species Conservation Program, City of San Diego, April 16, 2007 and Personal communication with Melanie Johnson, Biologist, Multiple Species Conservation Program, City of San Diego, April 25, 2007.

consisting of hand-weeding invasive species by volunteer labor and no management occurring in Subunit 2B.¹²⁶ It is estimated that 115¹²⁷ volunteer hours are spent on Thornmint management each year. Assuming a labor rate of \$22.76 per hour,¹²⁸ annual Thornmint management costs are approximately \$22.80 per acre.¹²⁹

- Monitoring within the Thornmint habitat is accomplished by four individuals; a volunteer of the Conservation Resources Network, and three paid employees who are paid \$30 per hour, on average.¹³⁰ All annual Thornmint monitoring activities are conducted during a single day.¹³¹ Therefore, annual Thornmint monitoring costs are estimated at approximately \$8.36 per acre.¹³²
- Administration of the City of San Diego Subarea Plan costs \$382,384 annually,¹³³ on average. Allocating these costs to the total number of acres in the MHPA, the annual administration cost is estimated at \$6.73 per acre.¹³⁴

The preceding discussion suggests that annual pre-designation City of San Diego Subarea Plan monitoring, management, and administration cost approximately \$37.89 per acre (in 2007 dollars). These annual costs may be understated as these do not take into account the probable involvement of City staff in subunits 2A and 2B. However, since no further information was provided by the City of San Diego's

¹²⁶ Ibid.

¹²⁷ Personal communication with Gina Washington, Senior Ranger, Los Peñasquitos Preserve, City of San Diego Parks and Recreation Department, May 2, 2007.

¹²⁸ Hourly labor rate is based on assumptions from: City of Carlsbad Planning Department, 2004, "Carlsbad Open Space Management Plan - Appendix A: Funding Analysis."

¹²⁹ $\frac{(115Hours)*(\$22.76PerHour)}{(62.8Acres + 52Acres)}$ for subunits 2A and 2B.

¹³⁰ Personal communication with Betsy Miller, Associate Planner, Multiple Species Conservation Program, City of San Diego, May 9, 2007.

¹³¹ City of San Diego, 2006, "Rare Plant Monitoring Report - Summary Results: San Diego Thornmint," <http://www.sandiego.gov/planning/mscp/pdf/monitor/acantho2006.pdf>, accessed May 9, 2007 and Personal communication with Betsy Miller, Associate Planner, Multiple Species Conservation Program, City of San Diego, April 16, 2007 and Personal communication with Melanie Johnson, Biologist, Multiple Species Conservation Program, City of San Diego, May 9, 2007.

¹³² $\frac{(4People*8Hours*\$30PerHour)}{(62.8Acres + 52Acres)}$ for subunits 2A and 2B.

¹³³ Average budgeted personnel expense for years 2000 through 2006. Personal communication with Betsy Miller, Associate Planner, Multiple Species Conservation Program, City of San Diego, May 9, 2007.

¹³⁴ $\frac{\$382,384PerYear}{56,831TotalAcres}$

Parks and Recreation Department, the analysis considers the presented annual pre-designation City of San Diego Subarea Plan monitoring, management, and administration cost as the best estimate.¹³⁵

This analysis assumes that future City of San Diego Subarea Plan costs for monitoring, management, and administration will be based on a funding plan implemented by the City in 2008, and that the costs will be similar to those incurred by the County under its County of San Diego Subarea Plan as both subarea plans are under the South County MSCP. Currently, the County Department of Parks and Recreation spends approximately \$200 per acre per year on management (\$186 per acre), monitoring (\$6 per acre), and administration (\$8 per acre) of its lands under the County of San Diego Subarea Plan (see Section C.1.2.3).¹³⁶ Therefore, this analysis assumes that, beginning in 2008, the City will also spend approximately \$200 per acre annually on the management, monitoring, and administration of its lands.

As described previously, the Subarea Plan has been funded through grants and the City's General Fund. At the time of development of the Subarea Plan, funding sources were not specifically identified.¹³⁷ Considering the mix of future funding sources is not known, this analysis assumes that the current funding structure will continue into the future and that the funding sources for the Plan will be similar to that of the County of San Diego Subarea Plan (see Section C.1.2.3), with the Federal and state governments funding approximately 20 percent and the City responsible for the remaining 80 percent.

In addition to monitoring and management, the City is building the preserve area (the MHPA). The preserve area may be compiled in a variety of ways, for example, "[l]ands within the City of San Diego MHPA are proposed to be conserved by one of the following five methods: 1) conservation of existing public lands; 2) land use restrictions of property within the MHPA through zoning regulations; 3) open space exactions directed toward building the MHPA imposed on new development outside the MHPA; 4) open space previously set aside on private lands for conservation as part of the development process; and

¹³⁵ Some sources suggest that City staff and contractors may also be involved in management of subunits 2A and 2B. Because no specific information was provided to support additional conservation activities, this analysis assumes that only volunteer labor for exotic species management has occurred in subunits 2A and 2B.

¹³⁶ While multiple species benefit from protective measures provided by the creation and management of preserve areas, no information is available for allocating the preserve area costs to Thornmint and other species protected by the HCPs. Therefore, this analysis assumes that preserve area costs are attributable entirely to Thornmint.

¹³⁷ "...the County and other Participating Local Jurisdictions will each be responsible for acquiring private lands within the MHPA, and for funding MHPA management, monitoring, and administrative costs. The MSCP Plan intends that funds to cover these local costs will be raised on a regional, County-wide, or MSCP Area-wide basis...including but not limited to a parcel tax/benefit assessment, community facilities district, general obligation bonds, Ad Valorem tax, and a sales tax." Source: County of San Diego, Multiple Species Conservation Program, Implementing agreement by and between United States Fish and Wildlife Service, California Department of Fish and Game, and County of San Diego, March 17, 1998.

Davis, Rob, April 16, 2007, "Once a National Model, Habitat Plan Faces Uncertain Future," *Voice of San Diego*.

5) public acquisition of private lands.¹³⁸ Historically, approximately one-third of the MHPA has been acquired through zoning restrictions, mitigation, and exactions, one-third through acquisitions by wildlife agencies, and one-third through acquisitions by local governments.¹³⁹

C.1.2 THE COUNTY OF SAN DIEGO MSCP SUBAREA PLAN

Adopted by the County Board of Supervisors in 1997, the County of San Diego Subarea Plan encompasses 252,132 acres of unincorporated areas in San Diego County, with 101,268 acres determined to be conserved within the South County MSCP MHPA.¹⁴⁰ The Plan was developed at a total cost of approximately \$1,000,000 (in 1997 dollars) over the course of seven years between 1991 and 1997, and covers all 85 species identified by the South County MSCP.¹⁴¹

The County of San Diego Subarea Plan also outlines land uses, both compatible and incompatible with the preserve.¹⁴² The incompatible activities include: 1) Grading; 2) Excavation; 3) Placement of soil, sand, rock, gravel, or other material; 4) Clearing of vegetation; 5) Construction; 6) Erection or placement of any building or structure; 7) Vehicular activities; 8) Trash dumping; and 9) Use for any purpose other than as open space or planting of vegetation materials. On the other hand, land uses allowed on the preserve are: 1) Selective clearing of vegetation by hand to the extent required by written order of the fire authorities for the express purpose of reducing an identified fire hazard; 2) Activities required to be conducted pursuant to a revegetation, habitat management, or landscaping plan approved by the Director of Planning and Land Use; 3) Vegetation removal or application of chemicals for vector control purposes where expressly required by written order of the Department of Health Services of the County of San Diego, in a location and manner approved in writing by the Director of Planning and Land Use of the County of San Diego; 4) Existing uses and recreational activities identified in the plans that generate the preserve areas; 5) Policing by local, state and Federal law enforcement agencies and fire protection agencies as necessary; 6) Scientific and biological uses; 7) Necessary infrastructure; and 8) Trails including equestrian, hiking, and bicycles in accordance with the management plan.

¹³⁸ Multiple Species Conservation Program, Frequently Asked Questions, available at: <http://www.sandiego.gov/planning/mscp/faq/index.shtml#preserved>

¹³⁹ Personal communication with Thomas Oberbauer, Chief, MSCP Division, Department of Planning and Land Use, County of San Diego, October 5, 2007.

¹⁴⁰ Northwest Economic Associates, 2005, "Economic Analysis of Critical Habitat Designation for the Spreading Navarretia."

¹⁴¹ Personal communication with Thomas Oberbauer, Chief, MSCP Division, Department of Planning and Land Use, County of San Diego, May 8, 2007, and County of San Diego, 2003, *Multiple Species Conservation Program Subarea Plan*, Section 1.2 "Goals."

¹⁴² County of San Diego, 2003, *Multiple Species Conservation Program Subarea Plan*, Section 1.9 "Land Uses Allowed Within the Preserve."

C.1.2.1 Thornmint Subunits

According to the proposed rule, two subunits in Unit 2 (subunits 2C and 2D), two subunits in Unit 3 (subunits 3A and 3B), and all of Unit 4 (subunits 4A through 4D) lie within the jurisdiction of the County of San Diego Subarea Plan. However, Subunit 2D is not a part of the MHPA. This land is owned by Superior Ready Mix Concrete of California, and was set aside as an open space easement by its owner prior to the listing of the species. This was a requirement to obtain a permit for new mining operations on parcels adjacent to the Subunit, near one of the densest populations of Thornmint. No Thornmint-related management or monitoring activities take place within the Subunit 2D.¹⁴³ Most of Subunit 2B and Unit 4 have been preserved, while all of Subunit 2D and most of subunits 3A and 3B have not. The following is a brief description of each subunit.

- Most of Subunit 2C belongs to the County of San Diego, with a small portion jointly owned by the State of California (25 percent) and the County (75 percent). The Subunit also lies within two private undeveloped parcels. Except for the private parcels, this Subunit is part of the Sycamore Canyon/Goodan Ranch Preserve, and was preserved as part of the MHPA prior to the listing of the species.
- Subunit 3A is privately-owned, and almost all of the Subunit is located on undeveloped parcels (three undeveloped and one developed parcel). While the privately-owned lands are within the jurisdiction of the County of San Diego Subarea Plan, the lands have not been incorporated into the MHPA.
- Most of Subunit 3B is privately-owned; a small portion was previously developed or donated to the CNF and incorporated into the MHPA as mitigation for the development (March 17, 2003), and the balance is in the process of either being developed or transferred to the USFS to be managed as part of the CNF and as part of the MHPA to mitigate for the development.
- Most of Subunit 4A is a part of McGinty Mountain Ecological Reserve (as well as most of subunits 4B and 4C), and is owned by the Environmental Trust (TET), with a small portion of the Subunit lying on a private parcel to the west and another small portion located on Service land to the south. Because TET is bankrupt, it is in the process of transferring its lands to the Service, which should be completed by 2008.¹⁴⁴ All but the private portion of the Subunit has been incorporated into the MHPA.
- Subunit 4B is owned by TET, California Department of Fish and Game (CDFG), The Nature Conservancy (TNC), and private owners (one parcel). All but the private portions of the Subunit have been incorporated into the MHPA. As with its lands in Subunit 4A, TET is transferring its

¹⁴³ Personal communication with Thomas Oberbauer, Chief, MSCP Division, Department of Planning and Land Use, County of San Diego, April 18, 2007.

¹⁴⁴ Personal communication with Richard Grimes, Real Estate Specialist, U.S. Fish and Wildlife Service, April 25, 2007.

lands in this Subunit to the Service. TNC is also planning to transfer its land in the Subunit to the Service and the transfer is expected to occur by 2011.¹⁴⁵

- Most of Subunit 4C is owned by TNC and the Service, and has been incorporated into the MHPA. As with its lands in Subunit 4B, TNC is planning to transfer its land in this Subunit to the Service by 2011. The balance of this Subunit is located on one private undeveloped parcel that has not been incorporated into the MHPA.
- Most of Subunit 4D is a part of Hollenbeck Canyon, and is owned by the State of California. It has been incorporated into the MHPA. The northern and eastern parts of the Subunit also lie on three private undeveloped parcels that have not been incorporated into the MHPA.

C.1.2.2 Thornmint Conservation

There are seven main, or general, objectives for protection of the species under the County of San Diego Subarea Plan jurisdiction. These include:¹⁴⁶

1. Acknowledge the no-net-loss-of-wetlands standard to satisfy state and Federal wetland goals, policies, and standards;
2. Provide for the conservation of spatially representative (e.g., coastal versus interior) examples of extensive patches of coastal sage scrub and other habitat types that were ranked as having high and very high biological value by the South County MSCP habitat evaluation model;
3. Create significant blocks of habitat to reduce edge effects and maximize the ratio of surface area to the perimeter of conserved habitats;
4. Provide incentives for development in the least sensitive habitat areas;
5. Provide for the conservation of key regional populations of the covered species, and representation of sensitive habitats and their geographic sub-associations in biologically functioning units; and
6. Conserve large interconnected blocks of habitat that contribute to the preservation of wide-ranging species such as mule deer, golden eagle, and predators as appropriate. Special emphasis will be placed on conserving adequate foraging habitat near golden eagle nesting sites.

Even though the South County MSCP calls for an 85 percent Thornmint habitat conservation, the County of San Diego Subarea Plan increases this conservation goal to 94 percent. Additionally, because Thornmint is designated as a “narrow endemic species” by the South County MSCP, the County of San

¹⁴⁵ Personal communication with Zach Principe, The Nature Conservancy, May 4, 2007.

¹⁴⁶ County of San Diego, 2003, *Multiple Species Conservation Program Subarea Plan*, Section 1.2 “Goals.”

Diego Subarea Plan includes additional conservation. These conservation measures follow a three-step process for mitigating any impacts to the Thornmint. These steps are:

1. Avoidance is required to the maximum extent possible;
2. If total avoidance is not feasible, then a maximum of 20 percent encroachment is allowed into a population; and
3. If avoidance and minimization of impacts results in no reasonable use of the property, mitigation at 1:1 to 3:1 ratio (in-kind) is required.¹⁴⁷

The County of San Diego Subarea Plan calls for each landowner within the MHPA to manage his own land once lands have been dedicated to the MHPA. Management of all County-owned land is done by the County of San Diego Department of Parks and Recreation (Subunit 2C). Other non-private landowners, whose land lies within the Study Area in the County of San Diego Subarea Plan, include the Service, USFS, State of California, TET, and TNC. Private landowners who dedicate their land to the MHPA, but retain land ownership, such as through a conservation easement, are responsible for fencing, but all other MHPA management costs are incurred by the entity that obtains the easement. The private landowner forgoes all MHPA management costs if land ownership is transferred (e.g., fee-title sale or donation).¹⁴⁸

C.1.2.3 Thornmint Conservation Costs and Funding

Following the recommendations of the South County MSCP, the original County of San Diego Subarea Plan budgeted for annual program costs of approximately \$42.21 per acre, including \$39.10 per acre for management, \$1.48 per acre for monitoring, and \$1.63 per acre for administration.¹⁴⁹ However, after further review by the County, it became apparent that \$42 per acre per year was not sufficient to carry out these activities.¹⁵⁰ Currently, the County spends approximately \$200 per acre annually (in 2007 dollars) to manage lands that it owns.¹⁵¹ Using the ratio of per-acre management, monitoring, and administration costs to total program costs from the original South County MSCP financing analysis, this analysis estimates that annual management, monitoring, and administrative costs approximate \$186, \$6, and \$8

¹⁴⁷ County of San Diego, 2003, *Multiple Species Conservation Program Subarea Plan*, Section 4.2.4 “Anticipated Conservation Levels for Species.”

¹⁴⁸ Personal communication with Thomas Oberbauer, Chief, MSCP Division, Department of Planning and Land Use, County of San Diego, October 4, 2007.

¹⁴⁹ San Diego County, 1998, *Multiple Species Conservation Program (MSCP), Final*, Section 7.3 “Program Costs.”

¹⁵⁰ Personal communication with Maeve Hanley, Program Manager, Resource Management Division/Group, Department of Parks and Recreation, County of San Diego, May 1, 2007.

¹⁵¹ Ibid.

per acre, respectively, and assumes that all land covered by the County of San Diego Subarea Plan costs approximately \$200 per acre annually to manage.¹⁵² Therefore, this analysis assumes that both pre-designation and post-designation costs are approximately \$200 per acre annually (in 2007 dollars).

Although the specific regional funding mechanism contemplated under the MSCP to finance the Subarea Plan is not in place, all work related to the County of San Diego Subarea Plan is funded by the County General Fund, as well as by the Federal (Endangered Species Act Section 6 grant funds) and state (mainly Prop 12 and Prop 117 funds) governments.¹⁵³ Federal and state funding make up approximately 20 percent of the management, monitoring, and administrative requirements, with the balance (80 percent) funded by the County General Fund.¹⁵⁴ Because grant and County General Funds have been sufficient for funding the management of the MHPA and the County's portion of MHPA land acquisition, the County plans to continue funding the MHPA with grants and General Fund monies in the future.¹⁵⁵

Similar to the City of San Diego Subarea Plan, the County is also building a preserve area (the MHPA), with lands being compiled by one of the following five methods: 1) conservation of existing public lands; 2) land use restrictions of property within the MHPA through zoning regulations; 3) open space exactions directed toward building the MHPA imposed on new development outside the MHPA; 4) open space previously set aside on private lands for conservation as part of the development process; and 5) public acquisition of private lands (see Section C.1.1.3). Historically, approximately one-third of the MHPA has been acquired through zoning restrictions, mitigation, and exactions, one-third through acquisitions by wildlife agencies, and one-third through acquisitions by local governments.¹⁵⁶

C.2 SAN DIEGO COUNTY MULTIPLE HABITAT CONSERVATION PROGRAM

A second subregional plan, the San Diego County MHCP, was completed in 2003, and includes the Thornmint as a covered species. The creation of the MHCP was prompted by the goal of accommodating

¹⁵² While multiple species benefit from protective measures provided by the creation and management of preserve areas, no information is available for allocating the preserve area costs to Thornmint and other species protected by the HCPs. Therefore, this analysis assumes that preserve area costs are attributable entirely to Thornmint.

¹⁵³ Personal communication with Trish Boaz, Chief, Resource Management Division, Department of Parks and Recreation, County of San Diego, May 3, 2007.

¹⁵⁴ Capital funding for the County of San Diego Subarea Plan based on approved capital fund budget for fiscal years 2007-2008 includes local (\$72.5 million), state (\$14.6 million), and Federal (\$1.3 million) governments, and other sources (\$330,000). This breaks down to 81.7, 16.5, 1.5, and 0.3 percent of total capital funding, respectively. Other sources include sale of fixed assets, court settlements, private donations, etc. Source: Personal communication with Denbigh Dickson, Chief of Administration, San Diego County Parks and Recreation, October 2, 2007.

¹⁵⁵ Personal communication with Thomas Oberbauer, Chief, MSCP Division, Department of Planning and Land Use, County of San Diego, October 4, 2007.

¹⁵⁶ Personal communication with Thomas Oberbauer, Chief, MSCP Division, Department of Planning and Land Use, County of San Diego, October 5, 2007.

economic growth in rapidly developing San Diego County, while at the same time protecting and conserving numerous rare, threatened, and endangered species. In total, the MHCP covers 51 species, of which 20 are Federally-listed.¹⁵⁷ Through approved subarea plans implemented by participating jurisdictions, the MHCP serves as an HCP pursuant to section 10(a)(1)(b) of the Act, as well as an NCCP pursuant to the California Natural Community Conservation Planning Act of 1991.

The San Diego County MHCP Study Area encompasses approximately 111,908 acres and seven jurisdictions. Currently, the City of Carlsbad is the only jurisdiction with an approved MHCP Subarea Plan. The Marine Corp Base Camp Pendleton borders the MHCP Study Area to the north, while in the east the Study Area is bounded by unincorporated areas of San Diego County that will soon be covered by the North County MSCP and the East County MSCP. The Pacific Ocean lies in the west of the Study Area and the San Diego County MSCP Plan Area is located at its southern border.

Similar to the South County MSCP, the San Diego County MHCP is an “umbrella” document that presents guidelines for jurisdictions to follow while creating their subarea plans. Conservation for covered species is accomplished through the creation and management of a multi-jurisdictional system of preserve areas known as Focused Planning Areas (FPA), defined by both “hardline” and “softline” boundaries. Hardline boundaries represent areas of 100 percent conservation, while softline boundaries are areas with varying levels of preservation. Levels of, and regulations pertaining to, habitat conservation are not uniform for habitat contained inside and outside the FPA of the MHCP Study Area. The FPA is approximately 20,593 acres.¹⁵⁸

Like the South County MSCP, the San Diego County MHCP will regulate impacts to covered species according to the State of California’s NCCP Guidelines, California Endangered Species Act, and criteria in Section 10(a) of the Act.¹⁵⁹

The San Diego County MHCP lists Thornmint as a “narrow endemic species.” As such, the MHCP calls for 100 percent conservation of its habitat by impact avoidance within the hardline FPA areas, 95 percent conservation level by impact avoidance, minimization, and species-specific mitigation within the softline FPA areas, and an 80 percent conservation level, based on impact avoidance, minimization, and species-specific mitigation outside of the FPA areas. The overall conservation of Thornmint habitat within the MHCP’s jurisdiction is estimated to be 91 percent.¹⁶⁰

¹⁵⁷ Northwest Economic Associates, 2005, “Economic Analysis of Critical Habitat Designation for the Spreading Navarretia.”

¹⁵⁸ Ibid.

¹⁵⁹ For a complete discussion of these guidelines, refer to section C.1.

¹⁶⁰ San Diego Association of Governments, 2003, *Multiple Habitat Conservation Program, Volume I – Final*, Section 3.3.1 “Conservation Analysis: Methods.” and San Diego Association of Governments, 2003, *Multiple Habitat Conservation Program, Volume II – Final*, Section 4.1 “Plants.”

As an “umbrella” document, the San Diego County MHCP calls for subarea plans to be developed by the local governments. These subarea plans are required to address the following:¹⁶¹

1. Methods of meeting conservation targets;
2. Avoidance of impacts and allowed encroachment;
3. Major populations;
4. Critical locations;
5. Narrow endemics;
6. Wetlands; and
7. Mitigation requirements.

Within the San Diego County MHCP subregional area, two subarea plans either presently affect, or will affect in the future, three of the proposed critical habitat subunits (subunits 1A, 1B, and 1C), the approved City of Carlsbad’s Subarea Plan and the “in process” City of Encinitas Subarea Plan. It is estimated that the City of Encinitas Subarea Plan may take effect during 2008.¹⁶² These subarea plans are described below.

C.2.1 THE CITY OF CARLSBAD MHCP SUBAREA PLAN

Permitted in 2004, the City of Carlsbad’s Habitat Management Plan (HMP), a subarea plan under the San Diego County MHCP, cost \$750,000 to prepare.¹⁶³ It encompasses 24,570 acres of land, of which 7,136 acres are managed under an Open Space Management Plan (OSMP) by numerous landowners and managers (see Section C.2.1.3). Out of the 7,136 acres in the OSMP, 6,400 are conserved.¹⁶⁴ In addition, 308 acres outside the City boundary are targeted for conservation by the City of Carlsbad HMP. This Plan covers 24 out of 51 species identified for protection under the MHCP.¹⁶⁵

The Subarea Plan’s allowed land uses within the preserve follow the practices for open space management outlined in the General Plan.¹⁶⁶

¹⁶¹ Ibid, Section 3.7 “Requirements for Subarea Plans to Protect Biological Resources.”

¹⁶² Personal communication with David de Cordova, Principal Planner, Planning and Building Department, City of Encinitas, May 2, 2007.

¹⁶³ Personal communication with Mike Grim, Senior City Planner, City of Carlsbad, May 3, 2007.

¹⁶⁴ City of Carlsbad, 2004, *Carlsbad Subarea Plan*, “Appendix A: Funding Analysis.”

¹⁶⁵ City of Carlsbad, 2004, *Habitat Management Plan for Natural Communities in the City of Carlsbad*, Section C “Description of the Plan Area.”

¹⁶⁶ Ibid, Section D “Conservation Strategy.”

C.2.1.1 Thornmint Subunits

Two of the proposed critical habitat subunits, 1A and 1B, lie within the City of Carlsbad HMP. Most of Subunit 1A is owned by the County of San Diego, with the remainder under private ownership (five parcels). The County-owned land is not part of the City of Carlsbad HMP FPA, and the County and City do not conduct Thornmint-related management on this County-owned land. Furthermore, there are no plans of preserving this land in the future.¹⁶⁷ On the other hand, the private parcels are within the jurisdiction of the City of Carlsbad HMP, and three of the five affected private parcels are undeveloped.

Most of Subunit 1B lies within the hardline conservation area for the City of Carlsbad HMP, existing as open space within a housing development. This land was conserved in 2004. The homeowner association (HOA) is charged with managing this land, having set up the required management funds according to the City of Carlsbad HMP specifications. The second part of this Subunit that is preserved belongs to the Santa Fe Trails Owners Association, which conserved the land in 2004. Also, there are several private parcels that are situated outside the City limits in the southern portion of the Subunit and, thus, are not a part of the hardline. In other words, these parcels are not targeted for protection under the City MHCP. One of these parcels is undeveloped.

C.2.1.2 Thornmint Conservation

Contrary to the San Diego County MHCP, which is structured around the FPA (originally designed to assist in the preserve design for the subarea plans), the City of Carlsbad HMP preserve is designed in terms of Existing Hardline, Proposed Hardline, and Standards Areas. Land conservation within both Existing Hardline and Proposed Hardline Areas is 100 percent, while land conservation within a Standards Area requires a zone-specific condition analysis for each parcel of land proposed for development. Conservation goals "...are based on the biological resources on the property and the amount of habitat preserved will vary property by property. Once a project in a Standards Area is finalized, the conserved habitat is converted to hardline status, and that piece will be 100 percent conserved."¹⁶⁸

The City of Carlsbad HMP's conservation measures consider Thornmint, among other species, and were developed to address the following biological and conservation objectives:¹⁶⁹

1. Conserve the full range of vegetation types remaining in the City, with a focus on rare and sensitive habitats;

¹⁶⁷ Personal communication with Mike Grim, Senior City Planner, City of Carlsbad, April 18, 2007.

¹⁶⁸ Personal communication with Roseanne Humphrey, Preserve Stewart, City of Carlsbad, April 26, 2007.

¹⁶⁹ City of Carlsbad, "Carlsbad Open Space Management Plan - Section 1," <http://www.carlsbadca.gov/pdfdoc.html?pid=476>, accessed May 9, 2007.

2. Conserve areas of habitat capable of supporting the City of Carlsbad HMP species in perpetuity;
3. Maintain functional biological cores;
4. Maintain functional wildlife corridors and habitat linkages within the City and to the region, including linkages that connect gnatcatcher populations and movement corridors for large mammals;
5. Conserve rare vegetation communities;
6. Conserve narrow endemic species and maintain populations of target species; and
7. Apply a “no net loss” policy to the conservation of wetlands, riparian, and oak woodland habitats throughout the City, and to coastal sage scrub and chaparral within the coastal zone.

Based on these conservation objectives, the Subarea Plan follows the specific directions for Thornmint conservation as outlined in the San Diego County MHCP. These conditions include:¹⁷⁰

1. The major populations and critical locations of Thornmint in Carlsbad and San Marcos must be conserved at a level consistent with the critical location policy, and managed as part of the preserve system.
2. Fire management plans must be implemented for all conserved populations to protect them from frequent or high-intensity fires and fire suppression activities. Fire management plans should include emergency access plans for conserved areas to protect populations from fires and disturbances associated with fire suppression.
3. As part of the project review process (e.g., CEQA) for individual projects within the MHCP area, a qualified biologist must survey for this species in all potential habitat areas.
4. The MHCP Narrow Endemic Policy must be applied to any populations of this species, including those already known and any found in the future.
5. Declining populations must be enhanced, and damaged habitat restored, if determined necessary through monitoring.
6. If not already established in the region by another entity, the MHCP management program must establish a seed bank as a guarantee against extinction and to provide source material for conservation and research activities. A seed bank must be established within 15 years of permit issuance. Collections should be based on established guidelines and subject to seed availability. Collected seed should be stored at an established seed bank facility (e.g., Rancho Santa Ana Botanic Garden or San Diego Wild Animal Park).

¹⁷⁰ San Diego Association of Governments, 2003, *Multiple Habitat Conservation Program, Volume II – Final*, Section 4.1 “Plants.”

7. All species-specific monitoring and management identified in the MHCP Monitoring and Management Plan shall be implemented.

C.2.1.3 Thornmint Conservation Costs and Funding

As described in the OSMP Funding Analysis,¹⁷¹ six entities, each charged with managing their own land (either through their own efforts, or through contracting a land management company, such as CNLM), are responsible for funding the conservation and management of the 7,136 acres managed under the OSMP. These entities are:¹⁷²

1. Biological management entity (CNLM) – 1,413 acres;
2. City of Carlsbad – 604 acres;
3. Future biological management entity (either CNLM or another similar company) for the currently unassigned private open space – 1,732 acres;
4. Other public organizations for the Standards Areas of the City of Carlsbad HMP (e.g., Cabrillo Power) – 420 acres;
5. Private/HOAs, managing their open space – 1,713 acres; and
6. State and Federal land (managed by CDFG) – 1,254 acres.

Each entity is responsible for funding both the initial costs of setting up its portion of the preserve and the annual cost of management, monitoring, and administration of its portion in perpetuity. The initial and annual requirements include costs for site construction and maintenance, biotic surveys, habitat maintenance (including exotic plant control), public services, general maintenance, reporting, office maintenance, field equipment, operations, contingency, and administration. In order to provide this annual funding, each entity is required to provide an endowment, which will generate an annual income (at an interest rate of 4.5 percent) equal to its share of the annual costs. The cost breakdown by entity is presented as follows (fire management costs are not included in the Funding Analysis, and are the responsibility of each property owner).¹⁷³

- The biological management entity (CNLM), managing 1,413 acres, is responsible for land set aside by developers as development mitigation land. The initial requirements for setting up this land are \$938,089, or \$664 per acre. The annual costs total \$393,453, or \$278 per acre (of which

¹⁷¹ City of Carlsbad, 2004, *Carlsbad Subarea Plan*, “Appendix A: Funding Analysis.”

¹⁷² Ibid.

¹⁷³ Ibid.

administrative costs equal \$76,152, or \$54 per acre) and require an endowment of \$8,743,399. The total financial obligation of developers to CNLM is \$9,681,488, or \$6,852 per acre.¹⁷⁴

- The City of Carlsbad, managing 604 acres, is responsible for land already owned by the City at the time of City of Carlsbad HMP development. The initial requirements for setting up this land are \$423,682, or \$701 per acre. The annual costs total \$192,769, or \$319 per acre (of which administrative costs equal \$37,310, or \$62 per acre) and require an endowment of \$4,283,748. The total financial obligation of the City is \$4,707,430, or \$7,794 per acre.
- A future biological management entity (either CNLM or another similar company) will be hired after the remaining unassigned private open space mitigation occurs. Developers will set aside 1,732 acres of land and fund its management. The initial requirements for setting up this land are \$1,017,965, or \$588 per acre. The annual costs total \$439,326, or \$254 per acre (of which administrative costs equal \$85,031, or \$49 per acre) and require an endowment of \$9,762,795. The total financial obligation of developers to CNLM is \$10,780,760, or \$6,224 per acre.
- Other public organizations, managing the Standards Areas, will be responsible for 420 acres. The initial requirements for setting up this land are \$249,313, or \$594 per acre. The annual costs total \$131,929, or \$314 per acre (of which administrative costs equal \$25,214, or \$60 per acre) and require an endowment of \$2,931,756. The total financial obligation of public organizations is \$3,181,069, or \$7,574 per acre.
- Private/HOAs, managing their open space, will be responsible for 1,713 acres. The initial requirements for setting up this land are \$1,002,995, or \$586 per acre. The annual costs total \$423,877, or \$247 per acre (of which administrative costs equal \$82,040, or \$48 per acre) and require an endowment of \$9,419,479. The total financial obligation of HOAs is \$10,422,473, or \$6,084 per acre.
- Finally, state and Federal land, managed by CDFG, totals 1,254 acres. This management is funded by the state and Federal governments. The initial requirements for setting up this land are \$820,658, or \$654 per acre. The annual costs total \$372,727, or \$297 per acre (of which administrative costs equal \$72,141, or \$58 per acre) and require an endowment of \$8,282,829. The total financial obligation of state and Federal agencies is \$9,103,488, or \$7,260 per acre.

The total City of Carlsbad HMP cost within the City of Carlsbad is \$43.4 million (excluding the cost of Plan development), or \$6,709 per acre.¹⁷⁵ These costs are summarized in Table C-1. Developers are expected to bear 42 percent of the initial costs of setting up the preserve and the annual cost of

¹⁷⁴ The HMP presents costs in 2004 dollars. The figures presented in this section have been inflated to 2007 dollars using CPI, All Urban Consumers, US City Average, 1982-84=100.

¹⁷⁵ While multiple species benefit from protective measures provided by the creation and management of preserve areas, no information is available for allocating the preserve area costs to Thornmint and other species protected by the HCPs. Therefore, this analysis assumes that preserve area costs are attributable entirely to Thornmint.

management, monitoring, and administration of the preserve in perpetuity, followed by private/HOAs (22 percent), Federal and state governments (19 percent), the City of Carlsbad (10 percent), and other public organizations (seven percent). In addition to the above conservation initiatives, the City of Carlsbad is also required to conserve 308 acres of habitat outside its City limits. The City's conservation costs will be funded by a special development fee that will only apply to the affected land, and will be funded by developers. This fee will remain in effect until the targeted acres are conserved and the endowment is set aside to fund annual management of that land. While none of the proposed critical habitat subunits are expected to be part of these 308 acres, the funding is described in the following paragraph in order to provide a complete discussion of the City of Carlsbad HMP costs and funding requirements.

Table C-1
Summary of City of Carlsbad HMP Costs (in 2007 dollars)

Entity	Acreage	Initial Requirement		Annual Costs		Endowment	Total Financial Obligation	
		Total	Per Acre	Total	Per Acre		Total	Per Acre
Biological Management Entity	1,413	\$938,089	\$664	\$393,453	\$278	\$8,743,399	\$9,681,488	\$6,852
City of Carlsbad	604	\$423,682	\$701	\$192,769	\$319	\$4,283,748	\$4,707,430	\$7,794
Future Biological Management Entity	1,732	\$1,017,965	\$588	\$439,326	\$254	\$9,762,795	\$10,780,760	\$6,224
Other Public Organizations	420	\$249,313	\$594	\$131,929	\$314	\$2,931,756	\$3,181,069	\$7,574
Private/HOAs	1,713	\$1,002,995	\$586	\$423,877	\$247	\$9,419,479	\$10,422,473	\$6,084
State & Federal	1,254	\$820,658	\$654	\$372,727	\$297	\$8,282,829	\$9,103,488	\$7,260
Total	7,136	\$4,452,702	\$624	\$1,954,080	\$274	\$43,424,007	\$47,876,709	\$6,709

Note: Numbers may not sum due to rounding.

The City of Carlsbad is responsible for 93 of the total 308 acres, with the rest being funded by local public and private organizations, such as Villages of La Costa. The Development Mitigation Fee applies to all undeveloped land with Group D (coastal sage scrub), E (non-native grasslands), or F (disturbed lands, eucalyptus, agricultural lands) habitat within the City of Carlsbad. The total estimated area affected by this fee is 681 acres. The fee amount, which is to be adjusted every six months for inflation, is \$25,683 per acre for Group D habitat, \$12,842 per acre for Group E habitat, and \$2,569 for Group F habitat.¹⁷⁶

The Development Mitigation Fee will generate \$3,852,091 for the City's 93 acres, of which \$1,353,510 will reimburse the owner(s) of 50 acres of habitat land purchased in the Core Area, \$1,806,800 will purchase another 43 acres of land, \$322,700 will be placed as an endowment to manage the 43 acres (endowment of \$7,500 per acre to provide annual income of \$300 per acre per year at a four percent return), and \$186,574 will fund planning and administration. Once a total of \$3,852,091 is collected by the City, the fee will no longer be collected.¹⁷⁷

C.2.2 THE CITY OF ENCINITAS MHCP SUBAREA PLAN

The City of Encinitas Subarea Plan is under development.¹⁷⁸ The proposed Plan covers 32 species, and will cost \$100,000 to \$150,000 to complete.¹⁷⁹ The Plan covers 12,516 acres within the City boundaries, as well as 830 acres within the City's "sphere of influence" outside its boundaries. Of these acres, 2,123 acres are to be conserved, which equal 81 percent of all natural habitat covered by the Plan. An additional 50 acres of wetland habitat outside the Study Area are expected to remain undeveloped.¹⁸⁰

Specific land uses within the preserve will follow those outlined in the City's General Plan, Local Zoning, and the Municipal Code, regarding open space use.¹⁸¹

¹⁷⁶ City of Carlsbad, January 17, 2006, Resolution #2005-373.

¹⁷⁷ Ibid.

¹⁷⁸ Personal communication with David DeCordova, Principal Planner, Planning and Building Department, City of Encinitas, April 30, 2007.

¹⁷⁹ City of Encinitas, 2001, *Public Review Draft Encinitas Subarea Plan*, Section 4.1.2 "Species Conserved." and Personal communication with David DeCordova, Principal Planner, Planning and Building Department, City of Encinitas, April 30, 2007.

¹⁸⁰ City of Encinitas, 2001, *Public Review Draft Encinitas Subarea Plan*, Section 4.1.1 "Habitats Conserved."

¹⁸¹ Ibid, Section 2.3 "General Plan, Local Zoning, and Ordinances."

C.2.2.1 Thornmint Subunits

Subunit 1C of the Study Area lies within the jurisdiction of the future Encinitas Subarea Plan. Most of this Subunit was set aside as a mitigation bank by Tech Construction Corp. in 1996. An endowment of \$290,000 was also provided by the company for the management of this property. To date, most of the mitigation credits have been used, except for a remaining few being held by the owner of Tech Construction Corp. This company also owns an undeveloped parcel in the southeastern corner of the Subunit that is not part of the mitigation bank. The rest of Subunit 1C is protected by an open space easement within the housing development in the south and southwest of the Subunit (entered into in 1996). The conservation bank and open space easement will be incorporated in the hardline conservation area when the Subarea Plan takes effect.¹⁸²

C.2.2.2 Thornmint Conservation

Habitat conservation by the Encinitas Subarea Plan will be based on hardline and softline land designations. Hardline areas will be 100 percent conserved, and made up of land designated as open space around developments. This land will primarily be managed by each applicable HOA. Softline areas will be partially conserved, based on specific conservation ratios for each type of habitat and species present. Narrow endemic species, such as Thornmint, however, are not affected by these ratios. Instead, the Encinitas Subarea Plan follows two goals specific to the narrow endemics. The first is the no net loss of any populations within the FPA, while the second is the gross loss of no more than 20 percent outside the FPA. These are further elaborated as follows:¹⁸³

- “No net loss of any populations, occupied acreage, or population viability within the FPA;
- In no case will more than five percent gross loss of narrow endemic points, populations, or occupied acreage will be allowed within the FPA and no more than 20 percent gross loss will be allowed within the city as a whole;
- Any take of narrow endemic species must be mitigated to achieve no net loss of this species;
- All conserved areas will include a buffer and will be added to the Encinitas preserve system; and
- All species populations listed as “critical” must be totally avoided.”

¹⁸² Personal communication with David DeCordova, Principal Planner, Planning and Building Department, City of Encinitas, April 27, 2007.

¹⁸³ City of Encinitas, 2001, *Public Review Draft Encinitas Subarea Plan*, Section 4.3.1.2 “Narrow Endemic Species Policies.”

The Encinitas Subarea Plan also follows the species-specific conservation directions for Thornmint, outlined in Volume II of the San Diego County MHCP and presented in Section C.2.1.2. Moreover, the Plan also specifies regulations that apply to lands bordering the preserve. These are:¹⁸⁴

- Drainage and toxins are to be regulated so as to prevent the release of toxins, chemicals, petroleum products, exotic plant materials, and other elements that might harm the protected species;
- The City’s Grading, Erosion, and Sediment Control Ordinance must be followed to avoid degradation of habitat from erosion and sedimentation;
- Lighting is to be directed away from the preserve;
- Noise impacts are to be minimized;
- Barriers around the preserve boundary may be required to direct public access to appropriate locations and reduce domestic animal predation;
- Landscaping is to be restricted within 1,000 feet around the preserve area, prohibiting the use of non-native, invasive plant species, as well as revegetation of areas of exotic plant species removal with native species appropriate to the adjacent preserve area; and
- Fire and brush management is to be conducted, according to the recommendations of the Wildland/Urban Interface Task Force.

Finally, private land within the preserve will either be managed by the HOAs (in the case of open space easements) or CNLM, funded by the City, in the case of mitigation land. These entities will be responsible for controlling trash, fire, and illegal encampments, while the City will be responsible for maintaining trails going through these lands. Biological monitoring will also be conducted, once the funding source is identified. Mitigation land and private land, purchased through public funds, will be managed along with other publicly-owned land within the preserve. Private landowners within the preserve, who are not beneficiaries of take permits, will have no obligations for management or monitoring on their lands, while private landowners who are beneficiaries of these permits will have the responsibility of funding management and monitoring on their lands.¹⁸⁵ Land held by the City will be managed by the MHCP Conservancy or another City designate. However, preserve land within the Encinitas Subarea Plan that is held by the County of San Diego will be managed by the County.¹⁸⁶

C.2.2.3 Thornmint Conservation Costs and Funding

Land acquisition by the Encinitas Subarea Plan will only occur when and if funding is available through grants from Federal and state governments, or from private foundations because habitat acquisition,

¹⁸⁴ Ibid, Section 4.2.2 “Land Uses Adjacent to the Preserve.”

¹⁸⁵ City of Encinitas, 2001, *Public Review Draft Encinitas Subarea Plan*, Section 7.1 “Preserve Manager.”

¹⁸⁶ Ibid.

enhancement, or restoration are not required to implement the plan. However, the City will accept dedication of private lands. Preserve management will be funded through the following two sources: 1) mitigation land will be managed using funds established by the development requiring mitigation; and 2) City-owned land will be managed using funds appropriated annually by the City of Encinitas from the City's Operating Budget. Preserve land held by other public agencies will be managed by those agencies. Should additional funding become available from the San Diego County MHCP, the funds will be used to supplement private and public funding of mitigation land management.¹⁸⁷ Monitoring of the preserve will be conducted jointly by Encinitas and other MHCP cities, the Service, and CDFG.

It is estimated that management, monitoring, and administration for the City of Encinitas MHCP Subarea Plan will cost between \$200 and \$300 per acre.¹⁸⁸ Because a funding plan has not yet been prepared by the Encinitas Subarea Plan, this analysis assumes its cost structure will be similar to that of the City of Carlsbad HMP (see Section C.2.1.3).

C.3 THE EAST COUNTY MULTIPLE SPECIES CONSERVATION PROGRAM

As of the time of the writing of this report, the East County MSCP is still in its early stages of development. The Department of Planning and Land Use estimate the Plan will be completed by 2010.¹⁸⁹ The East County MSCP study area is roughly "1.6 million acres and it is bounded on the west generally by the western boundary of the CNF, on the north by the Riverside County, and on the east predominantly by Imperial County, and the south by Mexico."¹⁹⁰ One unique aspect of the East County MSCP is that most of the land that will be under its jurisdiction is publicly owned, with approximately one-third owned by the state and managed by the Department of Parks and Recreation. Overall, it is projected that approximately 20 percent of the land within the East County MSCP Study Area will be under East County MSCP control.¹⁹¹ Finally, the East County MSCP will consider over 250 species for

¹⁸⁷ Ibid, Section 5.2 "Funding and Financing of the Plan."

¹⁸⁸ Personal communication with David DeCordova, Principal Planner, Planning and Building Department, City of Encinitas, April 27, 2007.

While multiple species benefit from protective measures provided by the creation and management of preserve areas, no information is available for allocating the preserve area costs to Thornmint and other species protected by the HCPs. Therefore, this analysis assumes that preserve area costs are attributable entirely to Thornmint.

¹⁸⁹ Personal communication with Thomas Oberbauer, Chief, MSCP Division, Department of Planning and Land Use, County of San Diego, May 14, 2007.

¹⁹⁰ East County MSCP Plan, "Overview," http://dplu-mscp.sdcounty.ca.gov/pub_out/eastcountyplan_overview.htm, accessed May 15, 2007.

¹⁹¹ Personal communication with Thomas Oberbauer, Chief, MSCP Division, Department of Planning and Land Use, County of San Diego, May 14, 2007.

inclusion, although this number will be reduced during the Plan's development based on criteria with attributes such as:¹⁹²

- “The distribution, life history, and vulnerability to human activity of the species are relatively well known, even if not completely understood;
- The viability and recovery of the species is dependent on or is greatly influenced by its management in the Plan Area. Species in this category obviously include those that are endemic to the Plan Area and those for which the Plan Area constitutes a significant portion of their range; for such species viability and recovery are highly dependent on the Plan. However, species might also be included if their range extends well beyond the Plan Area (for example, into Mexico), but the Plan presents a significant opportunity to further the conservation [of] the species;
- The Plan Area is potentially critical for providing connectivity, buffer zones, or refugia from disturbance for the species in question, even if its primary distribution is outside the Plan Area (for example, on public lands in the region); and
- A species can be used as a surrogate to represent a rare or threatened habitat type or an imperiled or ecologically important functional group of species (albeit in most cases we would favor targeting the habitat type directly...).”

C.3.1 THORNMINT SUBUNITS

Subunits 3C, 3D, 3E, and 3F lie within the future jurisdiction of the East County MSCP. Following is a brief description of each subunit.

- Most of Subunit 3C is located in the CNF. The remaining land, located in the southern portion of the Subunit, lies within five parcels of private land, with parcels ranging from 6 to 11 acres in size, that have been developed to single family residences.
- Subunit 3D consists of two parcels; one parcel is part of the CNF, while the other is privately-owned and undeveloped.
- Subunit 3E is part of the CNF.
- Most of Subunit 3F is part of the CNF. The southern portion of the Subunit lies within three parcels of private, undeveloped land.

¹⁹² Noss, Reed F., Paul Beier, Robert Fisher, Brian Foster, Jeffrey D. Opdycke, Esther Rubin, Drew Stokes, and Kathy S. Williams, March 31, 2006, “Report of the Independent Science Advisors on the San Diego East County MSCP (NCCP/HCP).”

C.3.2 THORNMINT CONSERVATION

As the Plan is still in the early stages of planning, Thornmint-related conservation measures and activities have not yet been specified. However, because this HCP will be created to collectively preserve the endangered species within San Diego County, together with the South County MSCP and the North County MSCP, this analysis assumes the conservation measures will be similar to those outlined in South County MSCP (see Section C.1.2.2).

C.3.3 THORNMINT CONSERVATION COSTS AND FUNDING

As no draft Plan exists at this time, cost structure for the East County MSCP is uncertain. This analysis assumes that both the cost and funding structures will be similar to the cost structure of the South County MSCP (see Section C.1.2.3).

APPENDIX D

DETAILED MAPS OF CURRENT LAND OWNERSHIP WITHIN THE STUDY AREA

Map D-1
San Diego Thornmint, Subunit 1A – Land Ownership

Map D-2
San Diego Thornmint, Subunit 1B – Land Ownership

Map D-3
San Diego Thornmint, Subunit 1C – Land Ownership

Map D-4
San Diego Thornmint, Subunit 2A – Land Ownership

Map D-5
San Diego Thornmint, Subunit 2B – Land Ownership

Map D-6
San Diego Thornmint, Subunits 2C and 2D – Land Ownership

Map D-7
San Diego Thornmint, Subunits 3A to 3F – Land Ownership

Map D-8
San Diego Thornmint, Subunits 4A to 4C – Land Ownership

Map D-9
San Diego Thornmint, Subunit 4D – Land Ownership

APPENDIX E
DETAILED MAPS OF HCP HARDLINE CONSERVATION AREAS

Map E-1
San Diego Thornmint, Subunit 1A – HCP Hardline Conservation Areas

Map E-2
San Diego Thornmint, Subunit 1B – HCP Hardline Conservation Areas

Map E-3
San Diego Thornmint, Subunit 1C – HCP Hardline Conservation Areas

Map E-4
San Diego Thornmint, Subunit 2A – HCP Hardline Conservation Areas

Map E-5
San Diego Thornmint, Subunit 2B – HCP Hardline Conservation Areas

Map E-6
San Diego Thornmint, Subunits 2C and 2D – HCP Hardline Conservation Areas

Map E-7
San Diego Thornmint, Subunits 3A to 3F – HCP Hardline Conservation Areas

Map E-8
San Diego Thornmint, Subunits 4A to 4C – HCP Hardline Conservation Areas

Map E-9
San Diego Thornmint, Subunit 4D – HCP Hardline Conservation Areas

APPENDIX F

SUMMARY RESULTS AT SEVEN PERCENT, THREE PERCENT, AND UNDISCOUNTED

Table F-1
Summary of Total Economic Impacts, by Habitat Subunit, in \$1,000s

Subunit	Pre-Designation (Total) (1998-2007)		Post-Designation (Total) (2008-2027)									
	Low	High	Undiscounted		PV 3%		PV 7%		Annualized 3%		Annualized 7%	
			Low	High	Low	High	Low	High	Low	High	Low	High
Areas Proposed for Final Designation												
1A	\$3	\$3	\$13	\$13	\$10	\$10	\$7	\$7	\$0	\$0	\$0	\$0
3B	\$5	\$5	\$28	\$28	\$21	\$21	\$15	\$15	\$1	\$1	\$1	\$1
3C	\$25	\$25	\$111	\$458	\$81	\$340	\$56	\$240	\$5	\$23	\$5	\$23
3D	\$3	\$3	\$339	\$1,986	\$245	\$1,469	\$168	\$1,040	\$16	\$99	\$16	\$98
3E	\$3	\$3	\$5	\$5	\$4	\$4	\$3	\$3	\$0	\$0	\$0	\$0
3F	\$14	\$14	\$68	\$293	\$50	\$218	\$35	\$154	\$3	\$14	\$3	\$14
Total	\$53	\$53	\$564	\$2,783	\$411	\$2,062	\$284	\$1,459	\$25	\$137	\$25	\$136
Areas Being Considered for Exclusion from Final Critical Habitat												
1A	\$0	\$0	\$43	\$244	\$31	\$180	\$21	\$128	\$2	\$12	\$2	\$12
1B	\$993	\$993	\$171	\$273	\$116	\$192	\$73	\$127	\$8	\$13	\$7	\$12
1C	\$19	\$19	\$52	\$111	\$38	\$82	\$27	\$58	\$2	\$5	\$2	\$5
2A	\$49	\$49	\$229	\$229	\$161	\$161	\$106	\$106	\$11	\$11	\$10	\$10
2B	\$2	\$2	\$125	\$264	\$86	\$189	\$55	\$128	\$6	\$13	\$5	\$12
2C	\$103	\$103	\$409	\$1,387	\$302	\$1,029	\$211	\$729	\$20	\$69	\$19	\$68
2D	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3A	\$0	\$0	\$214	\$1,266	\$154	\$938	\$106	\$664	\$10	\$63	\$10	\$63
3B	\$2,014	\$2,014	\$35	\$35	\$23	\$23	\$14	\$14	\$2	\$2	\$1	\$1
4A	\$16	\$16	\$25	\$74	\$19	\$56	\$14	\$40	\$1	\$4	\$1	\$4
4B	\$17	\$17	\$99	\$99	\$75	\$75	\$54	\$54	\$5	\$5	\$5	\$5
4C	\$9	\$9	\$47	\$209	\$34	\$154	\$23	\$109	\$3	\$11	\$3	\$11
4D	\$1	\$1	\$156	\$905	\$113	\$670	\$79	\$475	\$7	\$45	\$7	\$45
Total	\$3,223	\$3,223	\$1,605	\$5,096	\$1,152	\$3,749	\$783	\$2,632	\$77	\$253	\$72	\$248

Results are shown in \$1,000s. Numbers may not sum due to rounding

Table F-2
Summary of Economic Impacts to Development, by Habitat Subunit, in \$1,000s

Subunit	Pre-Designation (Total) (1998-2007)		Post-Designation (Total) (2008-2027)									
	Low	High	Undiscounted		PV 3%		PV 7%		Annualized 3%		Annualized 7%	
			Low	High	Low	High	Low	High	Low	High	Low	High
Areas Proposed for Final Designation												
1A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3C	\$0	\$0	\$71	\$418	\$51	\$310	\$35	\$219	\$3	\$21	\$3	\$21
3D	\$0	\$0	\$334	\$1,981	\$242	\$1,466	\$166	\$1,038	\$16	\$99	\$16	\$98
3E	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3F	\$0	\$0	\$46	\$271	\$33	\$201	\$23	\$142	\$2	\$13	\$2	\$13
Total	\$0	\$0	\$451	\$2,670	\$326	\$1,977	\$224	\$1,399	\$21	\$133	\$21	\$132
Areas Being Considered for Exclusion from Final Critical Habitat												
1A	\$0	\$0	\$43	\$244	\$31	\$180	\$21	\$128	\$2	\$12	\$2	\$12
1B	\$993	\$993	\$171	\$273	\$116	\$192	\$73	\$127	\$8	\$13	\$7	\$12
1C	\$0	\$0	\$14	\$73	\$10	\$54	\$7	\$38	\$1	\$4	\$1	\$4
2A	\$0	\$0	\$132	\$132	\$89	\$89	\$55	\$55	\$6	\$6	\$5	\$5
2B	\$2	\$2	\$125	\$264	\$86	\$189	\$55	\$128	\$6	\$13	\$5	\$12
2C	\$0	\$0	\$198	\$1,176	\$144	\$871	\$99	\$617	\$10	\$59	\$9	\$58
2D	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3A	\$0	\$0	\$214	\$1,266	\$154	\$938	\$106	\$664	\$10	\$63	\$10	\$63
3B	\$2,014	\$2,014	\$35	\$35	\$23	\$23	\$14	\$14	\$2	\$2	\$1	\$1
4A	\$0	\$0	\$10	\$59	\$7	\$44	\$5	\$31	\$0	\$3	\$0	\$3
4B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4C	\$0	\$0	\$33	\$195	\$24	\$144	\$16	\$102	\$2	\$10	\$2	\$10
4D	\$0	\$0	\$152	\$901	\$110	\$667	\$76	\$472	\$7	\$45	\$7	\$45
Total	\$3,009	\$3,009	\$1,127	\$4,618	\$794	\$3,391	\$527	\$2,376	\$54	\$230	\$49	\$225

Results are shown in \$1,000s. Numbers may not sum due to rounding

Table F-3
Summary of Economic Impacts Related to Recreation, by Habitat Subunit, in \$1,000s

Subunit	Pre-Designation (Total) (1998-2007)		Post-Designation (Total) (2008-2027)									
	Low	High	Undiscounted		PV 3%		PV 7%		Annualized 3%		Annualized 7%	
			Low	High	Low	High	Low	High	Low	High	Low	High
Areas Proposed for Final Designation												
1A	\$3	\$3	\$9	\$9	\$7	\$7	\$5	\$5	\$0	\$0	\$0	\$0
3B	\$5	\$5	\$28	\$28	\$21	\$21	\$15	\$15	\$1	\$1	\$1	\$1
3C	\$25	\$25	\$40	\$40	\$30	\$30	\$21	\$21	\$2	\$2	\$2	\$2
3D	\$3	\$3	\$5	\$5	\$3	\$3	\$2	\$2	\$0	\$0	\$0	\$0
3E	\$3	\$3	\$5	\$5	\$4	\$4	\$3	\$3	\$0	\$0	\$0	\$0
3F	\$14	\$14	\$22	\$22	\$17	\$17	\$12	\$12	\$1	\$1	\$1	\$1
Total	\$53	\$53	\$109	\$109	\$82	\$82	\$58	\$58	\$4	\$4	\$4	\$4
Areas Being Considered for Exclusion from Final Critical Habitat												
1A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1C	\$15	\$15	\$30	\$30	\$22	\$22	\$16	\$16	\$1	\$1	\$1	\$1
2A	\$32	\$32	\$63	\$63	\$47	\$47	\$33	\$33	\$3	\$3	\$3	\$3
2B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2C	\$102	\$102	\$204	\$204	\$152	\$152	\$108	\$108	\$10	\$10	\$10	\$10
2D	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4A	\$16	\$16	\$15	\$15	\$12	\$12	\$9	\$9	\$1	\$1	\$1	\$1
4B	\$17	\$17	\$99	\$99	\$75	\$75	\$54	\$54	\$5	\$5	\$5	\$5
4C	\$9	\$9	\$14	\$14	\$10	\$10	\$7	\$7	\$1	\$1	\$1	\$1
4D	\$0	\$0	\$1	\$1	\$1	\$1	\$1	\$1	\$0	\$0	\$0	\$0
Total	\$191	\$191	\$426	\$426	\$319	\$319	\$228	\$228	\$21	\$21	\$21	\$21

Results are shown in \$1,000s. Numbers may not sum due to rounding

Table F-4
Summary of Economic Impacts Related to Exotic Plant Species Management, by Habitat Subunit, in \$1,000s

Subunit	Pre-Designation (Total) (1998-2007)		Post-Designation (Total) (2008-2027)									
	Low	High	Undiscounted		PV 3%		PV 7%		Annualized 3%		Annualized 7%	
			Low	High	Low	High	Low	High	Low	High	Low	High
Areas Proposed for Final Designation												
1A	\$0	\$0	\$4	\$4	\$3	\$3	\$2	\$2	\$0	\$0	\$0	\$0
3B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3C	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3D	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3E	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3F	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$4	\$4	\$3	\$3	\$2	\$2	\$0	\$0	\$0	\$0
Areas Being Considered for Exclusion from Final Critical Habitat												
1A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1C	\$4	\$4	\$8	\$8	\$6	\$6	\$4	\$4	\$0	\$0	\$0	\$0
2A	\$17	\$17	\$34	\$34	\$25	\$25	\$18	\$18	\$2	\$2	\$2	\$2
2B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2C	\$1	\$1	\$7	\$7	\$6	\$6	\$4	\$4	\$0	\$0	\$0	\$0
2D	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4C	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4D	\$1	\$1	\$3	\$3	\$2	\$2	\$2	\$2	\$0	\$0	\$0	\$0
Total	\$23	\$23	\$52	\$52	\$39	\$39	\$28	\$28	\$2	\$2	\$2	\$2

Results are shown in \$1,000s. Numbers may not sum due to rounding