

DRAFT
Economic Analysis of Critical Habitat Designation for
Yadon's Piperia

Monterey County, California

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Executive Summary

Purpose and Approach

The purpose of this report is to estimate the economic impact of actions taken to protect the federally listed Yadon's Piperia, *Piperia yadonii*, and its habitat. This report was prepared by CRA International (CRA), for the U.S. Fish and Wildlife Service (Service).

This report attempts to quantify the economic effects associated with the proposed designation of critical habitat. It does so by taking into account the cost of conservation-related measures that are likely to be associated with future economic activities that may adversely affect the habitat within the proposed boundaries over a twenty year horizon, from 2007 to 2026. It also considers past costs associated with conservation of the species from the time the species was listed under the Endangered Species Act of 1973 (the Act) on August 12, 1998, through the present.

This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including them.¹ In addition, this information allows the Service to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).² This report also complies with direction from the U.S. 10th Circuit Court of Appeals that "co-extensive" effects should be included in the economic analysis to inform decision-makers regarding which areas to designate as critical habitat.³

Report Organization

Following the Executive Summary, Section I summarizes the purpose of the report. Section II provides an outline of the analytical framework. Section III describes the study method. Section IV describes the proposed critical habitat, including the primary constituent elements, threats, and the units and subunits. Section V presents historical information regarding consultations, the Recovery Plan published by the Service, and past conservation efforts. The economic impacts associated with the proposed critical habitat are presented in Section VI and are organized by unit and subunit. Section VII presents an evaluation of the impacts to the energy industry and small entities. Finally, past economic impacts are summarized in Appendix A.

¹ U.S. Code, Title 16, Chapter 35, §1533 Determination of endangered species and threatened species (b) Basis for determinations (2).

² 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.

³ In 2001, the U.S. 10th Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, 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)).

Background

On August 12, 1998, the Service published a final rule listing five plants from Monterey County, including the Yadon's Piperia (piperia), which was listed as endangered. In the final listing rule, the Service determined that designation of critical habitat for the piperia was not prudent.⁴ On August 13, 2004, the Service's decision not to designate critical habitat for the piperia was challenged by the Center for Biological Diversity and the California Native Plant Society. The Service agreed to a new proposed critical habitat determination for piperia by October 5, 2006.⁵ On October 18, 2006, the Service proposed 2,301 acres of critical habitat in Monterey County, CA for the piperia pursuant to The Act.⁶

Description of Habitat

Please see the Proposed Rule for a description of the piperia's habitat. The location of the proposed critical habitat units are shown in Figure 1 in Section IV.C of the report below.

⁴ 63 FR 43114.

⁵ 71 FR 61550.

⁶ 71 FR 61546.

Key Findings

Total Future Impacts: The draft economic analysis forecasts future costs associated with conservation efforts for the piperia within areas of proposed critical habitat to range from \$9.6 to \$12.9 million (undiscounted) over the next 20 years. The present value of these impacts, applying a 3% discount rate, is \$7.1 to \$9.6 million (\$0.47 to \$0.63 million annualized); or \$5.1 to \$6.8 million, using a discount rate of 7% (\$0.45 to \$0.60 million annualized).

Estimated Impacts: Costs to the Pebble Beach Company (PBC), and a single developer comprise the majority of the total quantified impacts in the areas of proposed critical habitat.

- **Pebble Beach Company:** PBC, which manages land in units 4a, 4b, 5, 6a, 6b, 6c, and 6e, has implemented management techniques designed to conserve the piperia and its habitat. Efforts include ongoing open space management and maintenance, golf course and residential area management and maintenance, site clean up and restoration, and monitoring and patrolling. As a result, total costs to the Pebble Beach Company of protecting and restoring the piperia habitat are \$6.9 million (undiscounted) over 20 years.
- **Single Developer:** One private residential developer owns land in unit 2b and plans to develop the land into a ten-lot subdivision. The permitting process is being delayed due to the proximity of the proposed development to environmentally sensitive habitat. Therefore, the developer is incurring a stream of costs due to delay. In addition to delay costs, the Monterey County Planning and Building Department may still place mitigation measures on the project. Mitigation measures could range from minor changes in the proposed development plans to denial of the permit. If the permit is denied, the developer will incur a loss in economic surplus of approximately \$3.0 million. Additionally, the developer may need to conduct monitoring and remove invasive plants. As a result, economic impacts to the developer range from \$0.47 to \$3.5 million.

Summary of Impacts Associated with Proposed Critical Habitat Area

The economic impacts associated with efforts to conserve the piperia within the area of proposed critical habitat are shown in Table ES-1 below. The impacts are ranked by the entity with the highest potential impact. Impacts include future costs associated with actions to conserve the species. Future costs are considered by describing a) the potential economic impact of managing the threats identified in the Proposed Rule according to management recommendations made by the Service and b) the present value of the economic surplus generated by activities within the area of critical habitat that may threaten the species. For future costs, a twenty year time period, 2007 to 2026, is considered. As shown in Table ES-1, total costs are calculated to be range from \$9.6 to \$12.9 million (undiscounted) over the next 20 years. The present value of these impacts, applying a 3% discount rate, is \$7.1 to \$9.6 million (\$0.47 to \$0.63 million annualized); or \$5.1 to \$6.8 million, using a discount rate of 7% (\$0.45 to \$0.60 million annualized).

Table ES-2 presents information similar to that in table ES-1: the economic impacts ranked by subunit.⁷ A summary of past costs are presented in Appendix A.

A screening analysis of potential effects on the energy industry and small entities was conducted. Designation of critical habitat is not expected to lead to a reduction in electricity production or an increase in the cost of energy production or distribution. As a result of the screening analysis, five small entities are potentially affected by conservation efforts for the piperia. Please see Table 18 for a summary of the results of the screening analysis.

⁷ The cost of conservation efforts in each subunit was estimated by multiplying the total cost to the landowner by the ratio of the acres in the subunit owned by the landowner over the total acres of proposed critical habitat owned by the landowner.

Table ES-1: Estimated Future Economic Impacts: Landowner Ranking**Estimated impacts occurring over 20-year time frame (2007 - 2026)**

Entity	Undiscounted Dollars	Present Value (3%)	Present Value (7%)	Annualized (3%)	Annualized (7%)
Pebble Beach Company Subunits 4, 5, 6a, 6b, 6c, 6e	\$6,868,760	\$5,109,490	\$3,638,387	\$333,435	\$320,970
Private Landowners Subunits 2b, 8	[\$500,727 - \$3,803,207]	[\$372,498 - \$2,829,286]	[\$265,273 - \$2,014,871]	[\$24,308 - \$184,633]	[\$23,402 - \$177,747]
Del Monte Forest Foundation Subunits 6a, 6c, 6d, 6e	\$1,000,218	\$744,036	\$529,816	\$48,554	\$46,739
PG&E Subunit 3a	\$725,500	\$536,386	\$376,898	\$35,003	\$33,249
Monterey County Subunit 2c	\$259,380	\$193,106	\$137,666	\$12,602	\$12,145
CA Dept. of Parks and Recreation Subunit 7	\$174,000	\$129,434	\$93,025	\$8,447	\$8,206
Elkhorn Slough Foundation Subunits 1a, 1b, 2a	\$41,480	\$31,208	\$22,575	\$2,037	\$1,991
City of Pacific Grove Subunit 6e	\$24,931	\$20,397	\$16,169	\$1,331	\$1,426
Caltrans Subunits 3b, 3c	\$3,533	\$2,638	\$1,890	\$172	\$167
Total Low	\$9,598,530	\$7,139,192	\$5,081,698	\$465,889	\$448,296
Total High	\$12,901,010	\$9,595,980	\$6,831,296	\$626,214	\$602,641

Note:

(1) 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).

Table ES-2: Estimated Future Economic Impacts: Unit Ranking							
Estimated impacts occurring over 20-year time frame (2007 - 2026)							
Unit	Acres	Entity	Undiscounted Dollars	Present Value (3%)	Present Value (7%)	Annualized (3%)	Annualized (7%)
6a	818	Pebble Beach Company	\$4,737,775	\$3,524,306	\$2,509,603	\$229,989	\$221,391
	81	Del Monte Forest Foundation	\$558,743	\$415,634	\$295,966	\$27,123	\$26,109
2b	83	Private Landowners	[\$465,726 - \$3,768,206]	[\$346,451 - \$2,803,239]	[\$246,714 - \$1,996,312]	[\$22,609 - \$182,934]	[\$21,765 - \$176,110]
4a	77	Pebble Beach Company	\$778,950	\$579,441	\$412,610	\$37,813	\$36,400
4b	77	Pebble Beach Company	\$778,950	\$579,441	\$412,610	\$37,813	\$36,400
3a	17	Pacific Gas & Electric	\$725,500	\$536,386	\$376,898	\$35,003	\$33,249
6c	47	Pebble Beach Company	\$272,219	\$202,497	\$144,195	\$13,215	\$12,721
	23	Del Monte Forest Foundation	\$158,655	\$118,020	\$84,040	\$7,702	\$7,414
6e	15	Pebble Beach Company	\$86,879	\$64,627	\$46,020	\$4,217	\$4,060
	29	Del Monte Forest Foundation	\$200,044	\$148,807	\$105,963	\$9,711	\$9,348
	19	City of Pacific Grove	\$24,931	\$20,397	\$16,169	\$1,331	\$1,426
2c	183	Monterey County	\$259,380	\$193,106	\$137,666	\$12,602	\$12,145
7	325	CA Dept. of Parks and Recreation	\$174,000	\$129,434	\$93,025	\$8,447	\$8,206
5	16	Pebble Beach Company	\$161,860	\$120,403	\$85,737	\$7,857	\$7,564
6d	12	Del Monte Forest Foundation	\$82,777	\$61,575	\$43,847	\$4,018	\$3,868
6b	9	Pebble Beach Company	\$52,127	\$38,776	\$27,612	\$2,530	\$2,436
8	73	Private Landowners	\$35,001	\$26,047	\$18,559	\$1,700	\$1,637
2a	231	Elkhorn Slough Foundation	\$26,690	\$20,081	\$14,526	\$1,310	\$1,281
1a	72	Elkhorn Slough Foundation	\$8,319	\$6,259	\$4,528	\$408	\$399
1b	56	Elkhorn Slough Foundation	\$6,470	\$4,868	\$3,521	\$318	\$311
3c	21	CA Dept. of Transportation	\$2,248	\$1,679	\$1,203	\$110	\$106
3b	12	CA Dept. of Transportation	\$1,285	\$959	\$687	\$63	\$61
Total Low			\$9,598,530	\$7,139,192	\$5,081,698	\$465,889	\$448,296
Total High			\$12,901,010	\$9,595,980	\$6,831,296	\$626,214	\$602,641
Note:							
(1) 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).							

I Purpose

The purpose of this report is to estimate the economic impact of actions taken to protect the federally listed *Piperia yadonii* (referred to as the piperia in this report) and its habitat. It attempts to quantify the economic effects associated with the proposed designation of critical habitat. It does so by taking into account the cost of 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 costs incurred since the piperia was listed, and it attempts to predict future costs likely to occur after the proposed critical habitat designation is finalized.

This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.¹ 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).² 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.³

II Analytical Framework

This economic analysis considers both the economic efficiency and distributional effects that may result from species and habitat protection. Economic efficiency effects generally reflect “opportunity costs” associated with the commitment of resources required to accomplish species and habitat conservation. Efficiency losses also include reductions in surplus levels resulting from economic activities such as land development. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of habitat conservation.

This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation activities on small entities and the energy industry. This information may be used to determine whether the effects of the designation unduly burden a particular group or economic sector. For example, while habitat conservation activities may have a small impact relative to the national economy, individuals

¹ 16 U.S.C. §1533(b)(2)

² 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.

³ In 2001, the U.S. Court of Appeals for the 10th Circuit instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, 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)).

employed in a particular sector of the regional economy may experience a significant level of impact. The difference between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

II.A 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 discern the implications on a societal level of a regulatory action. For regulations specific to the conservation of the piperia, 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 surplus in affected markets.⁴

In some instances, compliance costs may provide a reasonable approximation of the efficiency effects associated with a regulatory action. For example, a lead Federal agency may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The end result of the consultation may be a small amount of additional conservation measures for on-site impacts of the proposed activity. The cost of the additional conservation measures would have been spent on alternative activities if the proposed project area had not been occupied by the species or designated as critical habitat. In the case that 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 provides a reasonable estimate of the change in economic efficiency.

More generally, 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 real estate market.

II.B 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.⁵ This analysis considers several types of distributional

⁴ 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 EPA 240-R-00-003, September 2000, available at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.

⁵ U.S. Office of Management and Budget, “Circular A-4,” September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

effects, including impacts on small entities and impacts on energy supply, distribution, and use.

II.C Scope of the Analysis

This analysis identifies those activities believed to most likely threaten the listed species and its habitat and, where possible, quantifies the economic impact to avoid, mitigate, or compensate for such threats within the boundaries of the proposed critical habitat. In instances where critical habitat is being proposed after a species is listed, some future impacts may be unavoidable, regardless of the final designation and exclusions under 4(b)(2). However, due to the difficulty in making a credible distinction between listing and critical habitat effects within critical habitat boundaries, this analysis considers all future conservation-related impacts to be coextensive with the designation.⁶

Coextensive effects may also include impacts associated with overlapping protective measures of other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation. We note that 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, the impacts of these actions are considered relevant for understanding the full effect of the proposed designation. Enforcement actions taken in response to violations of the Act, however, are not included.

II.C.1 Sections of the Act Relevant to the Analysis

The analysis focuses on activities that are influenced by the Service through sections 4, 7, 9, and 10 of the Act. Section 4 of the Act focuses on the listing and recovery of endangered and threatened species, as well as critical habitat designation. According to section 4, the Secretary is required to list species as endangered or threatened “solely on the basis of the best available scientific and commercial data.”⁷

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

Section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action they authorize, fund, or carry out will not likely jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the species’ designated critical habitat. The administrative costs of these consultations, along with the costs of project modifications resulting from these

⁶ In 2001, the U.S. 10th Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, 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)).

⁷ 16 U.S.C. §1533.

consultations, represent compliance costs associated with the listing of the species and the designation of critical habitat.⁸

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.”⁹ The economic impacts associated with this section manifest themselves in sections 7 and 10. While incidental take statements are not issued for plant species, in situations where a Federal nexus exists, the Service is obligated to evaluate whether or not the proposed action is likely to jeopardize the continued existence of the species or adversely modify designated critical habitat.

Under section 10(a)(1)(B) of the Act, an entity (e.g. a landowner or local government) may develop a Habitat Conservation Plan (HCP) for an endangered animal species in order to meet the conditions for issuance of an incidental take permit in connection with the development and management of a property.¹⁰ The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately minimized and mitigated. The designation of critical habitat does not require completion of an HCP; however, the designation may influence conservation measures provided under HCPs. While HCPs are not developed solely for plant species, if listed plants occur in the area subject to the HCP, the Service must consider whether the proposed activities adversely affect or jeopardize the continued existence of the plant species.

II.C.2 Other Relevant Protection Efforts

The protection of listed species and habitat is not limited to the Act. Other Federal agencies, such as the Army Corps of Engineers, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction.

Managed by the California Department of Fish & Game (DFG), CESA is similar in nature and scope to the Federal ESA. It requires state agencies to consult with DFG over actions that may jeopardize the continued existence of a state-listed endangered or threatened species, or its habitat. Like the Federal ESA, it also allows for take incidental to otherwise lawful development projects.¹¹ The piperia has not been listed by the State of California under the California Endangered Species Act (CESA).

⁸ The Service notes, however, that a recent Ninth Circuit judicial opinion, *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, has invalidated the Service’s regulation defining destruction or adverse modification of critical habitat. The Service is currently reviewing the decision to determine what effect it (and to a limited extent *Center for Biological Diversity v. Bureau of Land Management* (Case No. C-03-2509-SI, N.D. Cal.)) may have on the outcome of consultations pursuant to section 7 of the Act.

⁹ 16 U.S.C. §1538 and 16 U.S.C. §1532.

¹⁰ U.S. Fish and Wildlife Service, “Endangered Species Habitat Conservation Planning,” <http://endangered.fws.gov/hcp/>.

¹¹ http://www.dfg.ca.gov/hcpb/ceqacesa/cesa/incidental/cesa_policy_law.shtml

In general, economic impacts will be evaluated regardless of whether or not species protection measures required by the Act are also required by other Federal agencies or State and local governments. The impacts of these protection measures are “co-extensive” with or attributable to the species’ listing and critical habitat designation. Examples of the type of regulations that fall into this category include but are not limited to the California Environmental Quality Act (CEQA) and Section 404 of the Clean Water Act.

II.C.3 Time Frame

The analysis examines activities taking place both within and adjacent to the proposed designation. It 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. Accordingly, the analysis bases estimates on activities that are likely to occur within a 20-year time frame, beginning on the day that the current proposed rule becomes available to the public. Forecasts of economic conditions and other factors beyond this point would be speculative. In addition, past impacts are measured starting at the listing of the species in 1998.

II.C.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.¹² OMB’s Circular A-4 distinguishes two types of economic benefits: *direct benefits and ancillary benefits*. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.¹³

In the context of critical habitat, the primary purpose of the rulemaking (i.e., direct benefits) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation 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.¹⁴ *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

¹² Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993.

¹³ U.S. Office of Management and Budget, “Circular A-4,” September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

¹⁴ *Ibid.*

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 rule making may be captured by the market through an identifiable shift in resource allocation, they are factored into the overall economic impact assessment in this report. For example, if decreased off-road vehicle use to improve species habitat leads to an increase in opportunities for wildlife viewing or hiking within the region, the local economy may experience an associated, measurable, positive impact. Ancillary benefits that affect markets are not anticipated in this case, and therefore are not quantified.

III Methodology

The methodology of this analysis is twofold. First, it quantifies past costs that have resulted from efforts to conserve the species within areas of critical habitat. Second, it considers future costs resulting from efforts to conserve the species. Future costs are considered by describing a) the present value of the economic surplus generated by land development and other activities within the area of critical habitat, and b) the potential impact of efforts to conserve the species by regulating these activities.

III.A Past Costs

This analysis defines past costs as costs that occurred between when piperia was listed under the Act (August 12, 1998) and the present (2006). Past costs were calculated by interviewing the affected entities within proposed critical habitat—typically landowners—to determine if any resources had been expended on management, consultation with the Service, or other activities intended to conserve the species. Past costs also include the value of any lost economic opportunities attributable to listing. For example, a housing development that was reconfigured to avoid development on areas containing piperia would incur an economic loss if those actions were required to conserve the species or its habitat.

III.B Future Costs

Future costs are costs of efforts to conserve the species that will occur between 2007 and 2026. These costs vary based on the reasonably-foreseeable highest and best economic uses for each individual parcel of land. For example, land owned by a public entity and designated as open space typically has little potential to be used for residential or commercial development purposes over the relevant time frame. In these cases, the future costs of critical habitat designation are calculated as the sum of the management and other burdens imposed on the landowner, discounted to present value.

IV Identified Habitat

The Service identified eight habitat units and fifteen subunits with known occurrences of the piperia.

IV.A Primary Constituent Elements

In identifying areas as critical habitat, the Service considered those physical and biological habitat features that are essential to the conservation of the species. These essential features are referred to as the species' primary constituent elements (PCEs). Please see the Proposed Rule for a description of the PCEs for piperia.

IV.B Threats

The Service identified the following threats to piperia that may require special management within the areas of proposed critical habitat:

1. Habitat fragmentation or loss due to residential, commercial, or recreational development;
2. Competition with nonnative plants for light, space, or water;
3. Deer and rabbit herbivory;
4. Vegetation cutting for fire prevention;
5. Changes in light, space, and soil moisture availability due to loss or alteration of adjacent vegetation or forest canopy;
6. Changes in fecundity (number and viability of offspring) or genetic variability resulting from loss and fragmentation of populations or potentially low pollinator abundance or activity;
7. Disease;
8. Trampling; and
9. Reduced opportunity to use fire as a management tool due to increased development surrounding piperia habitat.

IV.C Description of Units

All units are shown in Figure 1 below. The ownership within each of the proposed critical habitat units is summarized in the table following Figure 1.

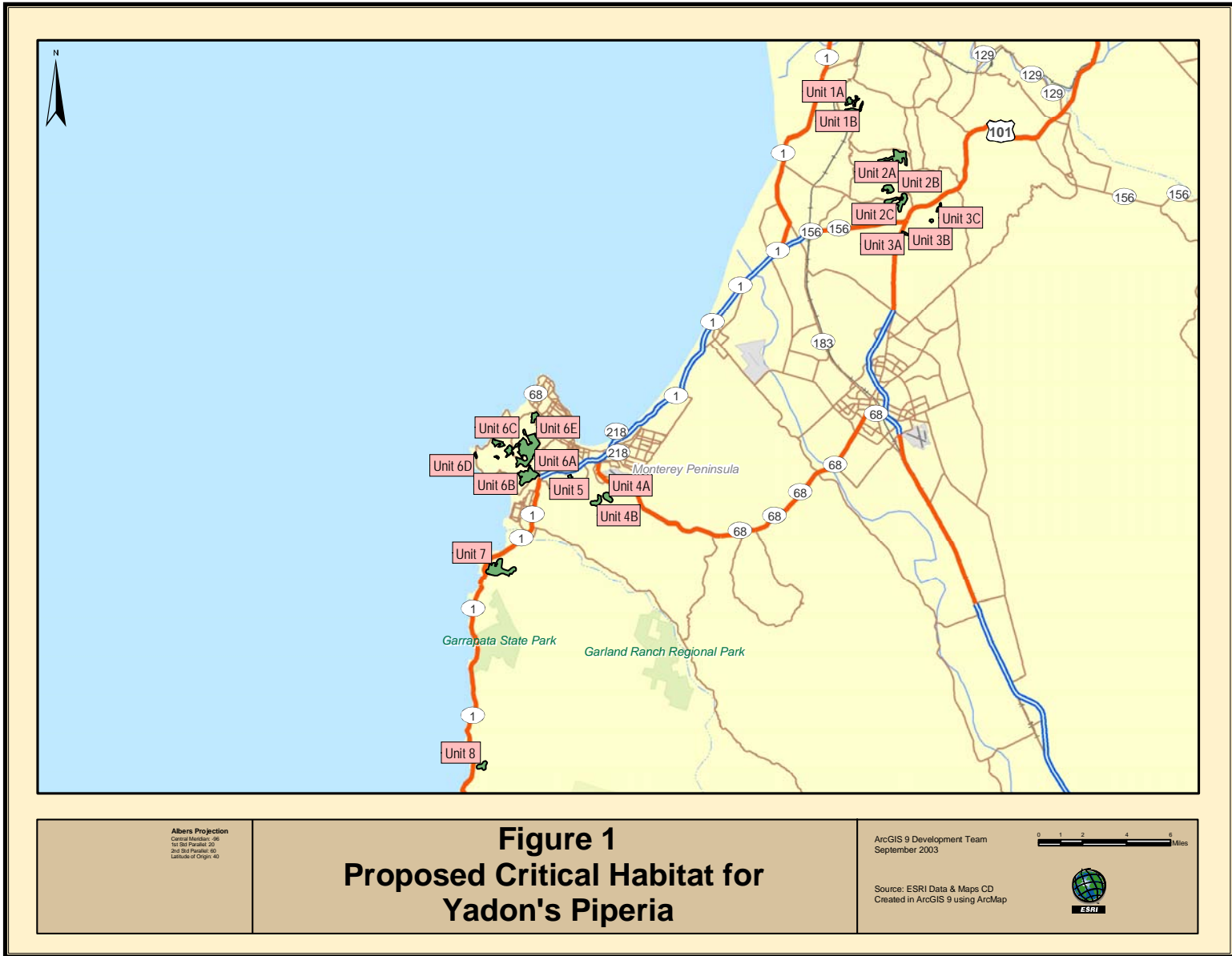


Table 1: Acres of Ownership by Type in Each Unit			
Subunit	Total Acres in Subunit	Owner Type	Acres
1A	72	Private conservation-oriented NGO	72
1B	56	Private conservation-oriented NGO	56
2A	231	Private conservation-oriented NGO	231
2B	83	Private	83
2C	183	Local Agency	183
3A	17	Private	17
3B	12	State	12
3C	21	State	21
4A	77	Private	77
4B	77	Private	77
5	16	Private	16
6A	904	Private	823
		Private conservation-oriented NGO	81
6B	9	Private	9
6C	70	Private	47
		Private conservation-oriented NGO	23
6D	12	Private conservation-oriented NGO	12
6E	63	Local agency	19
		Private	15
		Private conservation-oriented NGO	29
7	325	Private conservation-oriented NGO	97
		State	228
8	73	Private	73

V History of Conservation Efforts

Since the piperia was listed as endangered in 1998 there have been efforts to conserve the species.¹⁵ Past consultation results and the Recovery Plan aid in understanding what management actions the Service will recommend to landowners to conserve the piperia.

V.A Consultation History

Through the section 7 process, the Service has consulted with Federal agencies. There was also one exchange between the Service and a private entity on actions that could have potentially affected the piperia. However, there was no federal nexus and therefore no consultation with the private entity. The consultations include:

- One formal and two informal consultations in 1998 with the United States Department of Agriculture Natural Resources Conservation Service (NRCS) and the U.S. Army Corps of Engineers regarding the Elkhorn Slough Watershed

¹⁵ 63 FR 43100.

Project. As a result of the consultation, the NRCS developed steps to minimize adverse effects to listed, proposed, and candidate species in order to complete the project.

- Two informal consultations in 1997 and 1999 with the Department of the Army regarding the Closure and Reuse of Fort Ord. It was found that the project would have no effect on the piperia and the species was not addressed further in the consultations.
- One formal consultation in 2001 with the Department of the Navy, regarding the Invasive Plant Species Control and Vegetation Management Activities at the Naval Postgraduate School. As a result of the consultation, the Navy took steps to minimize harming the piperia.
- One informal consultation in 2002 with the Department of the Navy and the Army Corps of Engineers, regarding the Residential Communities Initiative Project. It was found that the project would have no effect on the piperia because the Navy and the Corps implemented avoidance and protection measures.
- One formal consultation in 2003 with the NRCS, regarding the Salinas River Watershed Permit Coordination Program. The consultation led the NRCS to develop management plans and conservation practices to reduce negatively affecting the piperia.

V.B Recovery Plan

In 2004, the Service published a recovery plan for the piperia, along with 4 other threatened or endangered plants in the Monterey County area.¹⁶ The objective of the Recovery Plan is to recover the species sufficiently to down-list the piperia from endangered to threatened status. The Recovery Plan serves as an indicator of what actions could be taken if special management actions are needed to conserve the species in the area of proposed critical habitat.

Please see the Recovery Plan for a more detailed outline of how to implement the Recovery Actions.¹⁷

¹⁶ U.S. Fish and Wildlife Service, 2004, Recovery Plan for Five Plants from Monterey County, California, U.S. Fish and Wildlife Service, Portland, Oregon, xii + 159 pp.

¹⁷ U.S. Fish and Wildlife Service, 2004, Recovery Plan for Five Plants from Monterey County, California, U.S. Fish and Wildlife Service, Portland, Oregon, xii + 159 pp.

Threat	Recovery Action
Habitat loss and fragmentation due to urbanization and recreational (e.g., golf course) development.	Inform landowners. Secure and protect existing sites. Minimize threats. Establish a working group to develop and implement recovery guidelines. Use research results and monitoring data to determine effectiveness of management. Develop a public outreach program.
Competition from nonnative species.	Minimize threats. Use research and monitoring data to determine effectiveness of management. Establish a working group to develop and implement recovery guidelines. Develop a public outreach program.
Roadside maintenance (mowing); a fire directive requesting removal of roadside vegetation for prevention of wildfires.	Advise landowners and planning departments for proper management. Minimize threats. Use research results and monitoring data to determine effectiveness of management. Develop a public outreach program.
Potential increase in deer grazing of flowering stems.	Advise landowners. Minimize threats. Obtain specific data to manage the listed species.
Roadway circulation improvement at Monterey Peninsula Airport.	Consult with agencies. Protect habitat. Manage land to control threats. Coordinate with lead agency.
Proposed realignment of U.S. Route 101 near Prunedale.	Consult with agencies. Protect habitat. Manage land to control threats. Coordinate with lead agency.
Collection of plants by horticulturists / researchers.	Advise landowners. Secure and protect existing sites. Minimize threats. Develop a public outreach program.
Possibly, loss of viable habitat due to changes in vegetation structure within areas following fire suppression.	Inform landowners and planning department for proper management. Manage land to control threats. Use research results and monitoring data to determine effectiveness of management.
<i>Source:</i> U.S. Fish and Wildlife Service, 2004, Recovery Plan for Five Plants from Monterey County, California, U.S. Fish and Wildlife Service, Portland, Oregon, xii + 159 pp, page C-3.	

V.C Pebble Beach Company’s Del Monte Forest Preservation and Development Plan

The Pebble Beach Company completed a Final Environmental Impact Report in January of 2005 which detailed the Company’s plans to develop part of their land on the Monterey Peninsula and conserve areas of undeveloped Monterey Pine forest at the same time. Part of the environmental impact report is specifically concerned with conserving the Yadon’s piperia and its habitat. Another section of the report focuses on conserving Monterey Pine Forest in general, which will also aid in protecting the piperia and its habitat from adverse effects of the proposed development.

The proposed development project, how it has been scaled back from original plans, and the mitigation measures required are discussed in further detail in Sections VI.D, VI.E, and VI.F of this report. The primary mitigation requirements for project impacts on the piperia include:

- Redesign of the Stevenson drive realignment and avoidance of residential development, utility line construction and equestrian center development within certain areas containing the piperia;
- Dedication of the proposed and additional preservation areas for the piperia;
- Applicant funding and implementation of a final Piperia Plan, to expand populations of piperia larger than the net loss of occupied habitat from the proposed development project and to enhance existing populations to offset net indirect effects from the proposed development; and
- Resource management of exiting populations in preservation, conservation, and resource management areas and additional measures during construction and operations to reduce impact on the piperia.¹⁸

VI Economic Impacts of Conservation Efforts in Proposed Critical Habitat for Yadon’s Piperia

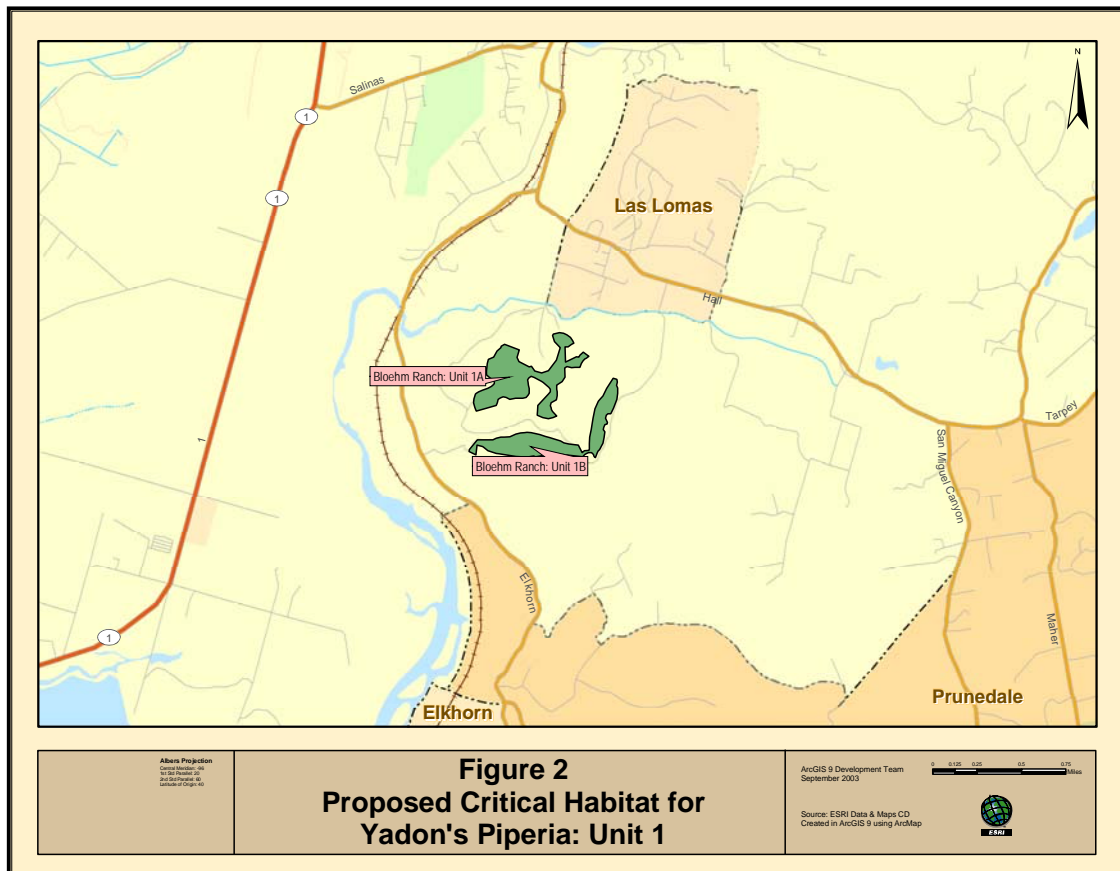
The economic impacts in each subunit are described below, along with a summary of ownership and threats in each unit and subunit.

VI.A Unit 1: Blohm Ranch

Threats that may require special management in this unit are: removal of the piperia occurrence or its associated natural community to accommodate road construction, agricultural, or other facilities (e.g. reservoirs); the growth and spread of invasive plant species (such as Jubata grass); erosion from old roadbeds or past earth-moving activities; and herbivory. Special management may also be needed to ensure that the abundance of potential pollinators, such as moths or bees, are maintained or enhanced.¹⁹

¹⁸ Monterey County, Pebble Beach Company’s DMF/PDP Final EIR, January 2005, p ES-16.

¹⁹ 71 FR 61556-7.



Subunit 1a consists of 72 acres of private land owned by the Elkhorn Slough Foundation and The Nature Conservancy and managed by the Elkhorn Slough Foundation.²⁰

Subunit 1b consists of 56 acres of private land owned by The Nature Conservancy and managed by the Elkhorn Slough Foundation, or owned and managed by the Elkhorn Slough Foundation.²¹

The Elkhorn Slough Foundation is not planning to build any roads or facilities, including reservoirs and homes, on the proposed critical habitat. Agricultural activities are not allowed in the proposed critical habitat. The piperia is not threatened by removal to accommodate development. Additionally, there is no public access allowed in the maritime chaparral habitat, except for the supervised nature walks the Foundation leads twice a year for small groups of people.²² The Service has indicated that road construction, agriculture, and development of other facilities need no further management

²⁰ 71 FR 61557.

²¹ *Ibid.*

²² Personal communication from Land Manager, Elkhorn Slough Foundation, December 13, 2006.

attention on Elkhorn Slough Foundation land.²³ Therefore, costs of managing these potential threats are not estimated in this report.

The Foundation has been managing the growth and spread of invasive plant species, in particular Jubata grass, for over seven years. The Foundation conducts surveys on foot numerous times a year. The Jubata grass is removed by digging up each plant with a special hand tool. If follow-up control is needed, the plant is sprayed with a solution of 2% Round-Up and dye that clearly marks where the herbicide was applied.²⁴

The growth and spread of invasive species has been largely controlled in the area of proposed critical habitat for the piperia. The Foundation is now focusing on outreach campaigns to the Foundation's neighbors to eradicate the Jubata grass. The past costs of controlling the invasive species within the area of proposed critical habitat since the time of listing are approximately \$14,450.^{25,26} All staff members involved in the invasive plant removal efforts have been trained to identify and avoid the piperia through educational fact sheets developed by the Coastal Training Program.²⁷ The past cost to the Coastal Training Program of developing the fact sheet for the piperia was approximately \$5,318.²⁸

The costs for invasive species control represent efforts over the entire 359 acres of Foundation land proposed for critical habitat designation for the piperia (subunits 1a, 1b, and 2a). Past costs were \$55 per acre to control the spread of invasive plants.²⁹

Costs of maintaining control of the invasive species within the proposed critical habitat in the future are expected to be around \$1,900 per year.³⁰ Maintenance control will probably always be needed.³¹

Erosion from roads is not considered a threat by the Foundation, because there are no actively used roads running through the proposed critical habitat unit; only trails. Erosion from old man-made reservoirs used to be a threat to the maritime chaparral habitat within the proposed critical habitat areas. These reservoirs were built on ridge-tops in maritime chaparral in order to irrigate lower-elevation agricultural lands by gravity. Many of these

²³ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, December 18, 2006.

²⁴ Personal communication from, Land Manager, Elkhorn Slough Foundation, December 13, 2006.

²⁵ 60 labor-hours per year, at a rate of \$30 per labor-hour; 5 hand tools at a price of \$40 each; herbicide purchased each year at a price of \$100 per year; invasive plant removal has occurred for approximately 7.5 years.

²⁶ Personal communication from, Land Manager, Elkhorn Slough Foundation, December 13, 2006.

²⁷ Personal communication from, Land Manager, Elkhorn Slough Foundation, December 13, 2006.

²⁸ Electronic communication from Coastal Training Program Coordinator, Elkhorn Slough National Estuarine Research Reserve, January 18, 2007.

²⁹ \$19,768 divided by 359 acres.

³⁰ \$1,800 per year for labor and \$100 per year for herbicides.

³¹ Personal communication from Land Manager, Elkhorn Slough Foundation, December 13, 2006.

reservoirs blew out, causing large-scale erosion problems in the maritime chaparral habitat. The Foundation has controlled the erosion problem by laying out rice straw and jute fabric. The cost of controlling the threat of erosion within the piperia habitat since the time of the listing has been approximately \$100,000. The erosion from the old reservoirs has been almost completely controlled at this point. Future costs are expected to be no more than \$1,000 in total over the next three to four years to completely control the problem within the piperia habitat.³²

The Foundation regularly surveys the proposed critical habitat area and checks on the status of the populations of piperia in the proposed critical habitat. Through these surveys, the Foundation has determined that herbivory does not threaten the success of the piperia within the proposed critical habitat.^{33,34} The Service has advised that the Foundation continue surveying the piperia for possible herbivory. The need for action to protect the piperia will depend on the outcome of the surveying. If the surveying finds herbivory to be a problem, the cost to the Foundation of installing cages around the plants would be around \$640 initially.³⁵ The annual cost of checking on the cages would be around \$60.³⁶ The cages need to be replaced every 10 years at a cost the same as the initial installation, about \$640.³⁷

In the proposed rule, the Service stated that special management may be needed to ensure that the abundance of potential pollinators, such as moths or bees, are maintained or enhanced. The Foundation owns large, contiguous tracts of preserved habitat, which it considers to positively contribute to pollination of the piperia and other plants. During its regular surveys of the piperia habitat, the Foundation has not noticed the area to be lacking in potential pollinators. In addition, herbivory has not been found to be a problem for the piperia, and so the plant is believed to have a large enough flower display to attract pollinators.³⁸ The Service would advise that the Foundation continue its current surveying efforts, but not take any actions until the relationship between pollinators and the piperia are better understood.³⁹ Therefore costs of special management to ensure the abundance of potential pollinators are not calculated for this report.

³² Personal communication from Land Manager, Elkhorn Slough Foundation, December 13, 2006.

³³ Herbivory is believed to not be a problem in this unit because the deer and rabbit populations were heavily hunted in the recent past and their populations have not fully recovered. In addition, there are numerous herbivore predators, including bobcats and mountain lions, in the area to keep the deer and rabbit populations under control naturally.

³⁴ Personal communication from Land Manager, Elkhorn Slough Foundation, December 13, 2006.

³⁵ Cost of installing cages is around \$240.00 assuming it takes 8 labor-hours at a rate of \$30 per labor-hour; cost of purchasing all cages is approximately \$400.

³⁶ Two labor-hours at a rate of \$30 per labor-hour.

³⁷ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, December 18, 2006.

³⁸ Personal communication from Land Manager, Elkhorn Slough Foundation, December 13, 2006.

³⁹ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, December 18, 2006.

Table 3: Estimated Economic Impacts to Elkhorn Slough Foundation, Units 1a, 1b and 2a

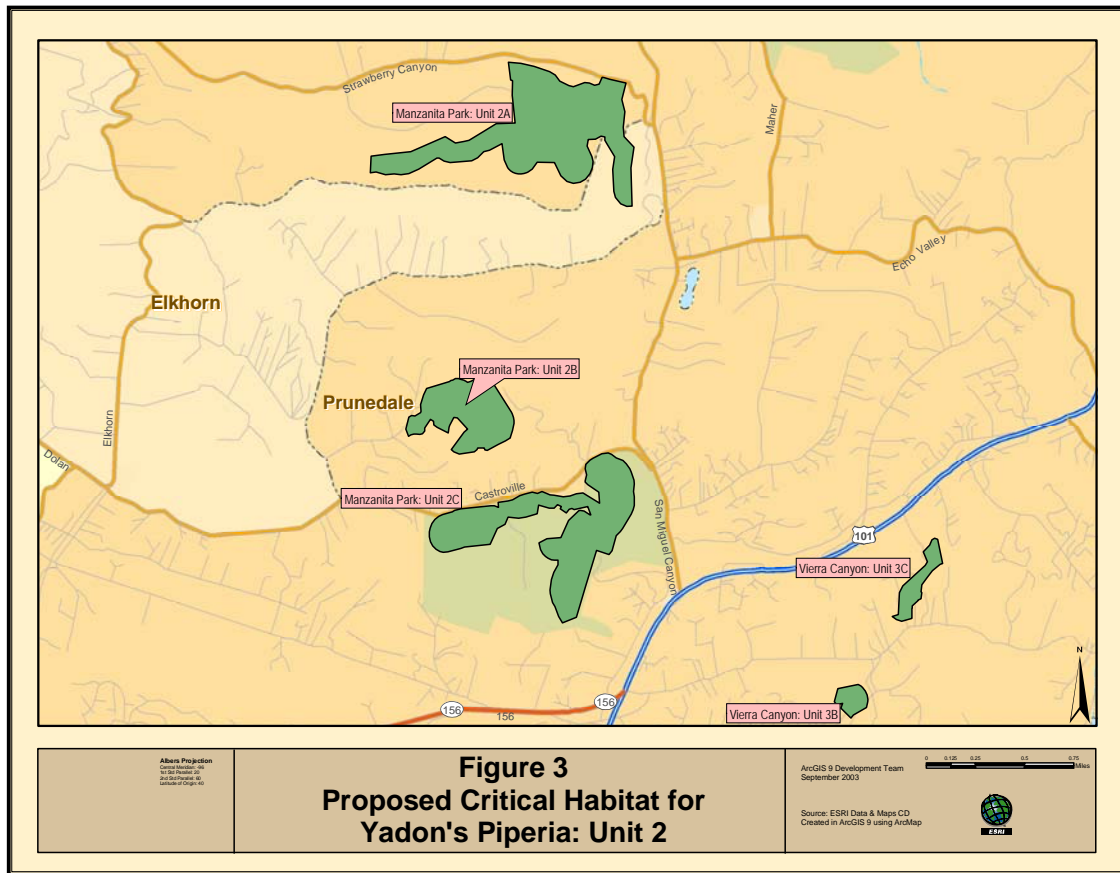
Threat	Management Action	Past Cost			Future Costs		
		Undiscounted Dollars	Present Value (3%)	Present Value (7%)	Undiscounted Dollars	Present Value (3%)	Present Value (7%)
Removal of piperia for roads, agriculture, or other facilities	None. Determined not a threat	\$0	\$0	\$0	\$0	\$0	\$0
The growth and spread of invasive plant species	Remove invasive species from piperia habitat ⁽¹⁾	\$19,768	\$24,674	\$32,834	\$38,000	\$28,267	\$20,129
Erosion	Control erosion in piperia habitat ⁽²⁾	\$100,000	\$130,477	\$183,846	\$1,000	\$936	\$861
Herbivory	Monitor. If necessary, install cages around piperia plants to prevent herbivory	\$0	\$0	\$0	\$2,480	\$2,005	\$1,585
Elimination or fragmentation of habitat from residential development	None. Determined not a threat	\$0	\$0	\$0	\$0	\$0	\$0
Vegetation removal for fuel reduction purposes	None. Determined not a threat	\$0	\$0	\$0	\$0	\$0	\$0
Disease	Monitor. No management actions needed until threat better understood	\$0	\$0	\$0	\$0	\$0	\$0
Lack of pollinators	Monitor. No management actions needed until threat better understood	\$0	\$0	\$0	\$0	\$0	\$0
Total		\$119,768	\$155,151	\$216,680	\$41,480	\$31,208	\$22,575
Annualized Cost					\$2,037	\$1,991	

Notes:

- (1) Invasive species control has occurred over the past 7 to 8 years
- (2) Erosion control has occurred over the past 9 years (since the time of listing in 1998)
- (3) Italicized costs are costs that will be incurred only if necessary after monitoring and further research.
- (4) 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).

VI.B Unit 2: Manzanita Park

Threats that may require special management in this unit are: elimination or further fragmentation of habitat from residential development; vegetation removal for fuel reduction purposes; the growth and spread of invasive plant species, such as Jubata grass, French broom, and eucalyptus; disease; and herbivory. Special management may also be needed to ensure the abundance of potential pollinators, such as moths or bees, are maintained or enhanced to ensure the production of sufficient viable seed.⁴⁰



Subunit 2a consists of 231 acres of land owned and managed by the Elkhorn Slough Foundation.⁴¹ Please see the previous section for a discussion of development, invasive species, and herbivory on land owned and managed by the Elkhorn Slough Foundation.

The Elkhorn Slough Foundation does not engage in fuel reduction activities in areas where the piperia is found. Vegetation removal for fuel reduction purposes is not a threat

⁴⁰ 71 FR 61557.

⁴¹ 71 FR 61557.

to the piperia on land managed by the Foundation.⁴² Therefore, the Service has advised that management actions to protect the piperia from this threat are not needed.⁴³

The Foundation does not consider fungal diseases to be a threat to the piperia on their land since public access is limited to two small, guided tours each year, thus limiting the potential of fungal diseases to be tracked into the area by hikers or horses.⁴⁴ The Service has advised that the Foundation continue its current surveying efforts, but not take any actions until disease in the piperia is better understood.⁴⁵ Therefore costs of management to protect the piperia from disease are not calculated for this report.

See Table 3 above for a summary of impacts to the Elkhorn Slough Foundation.

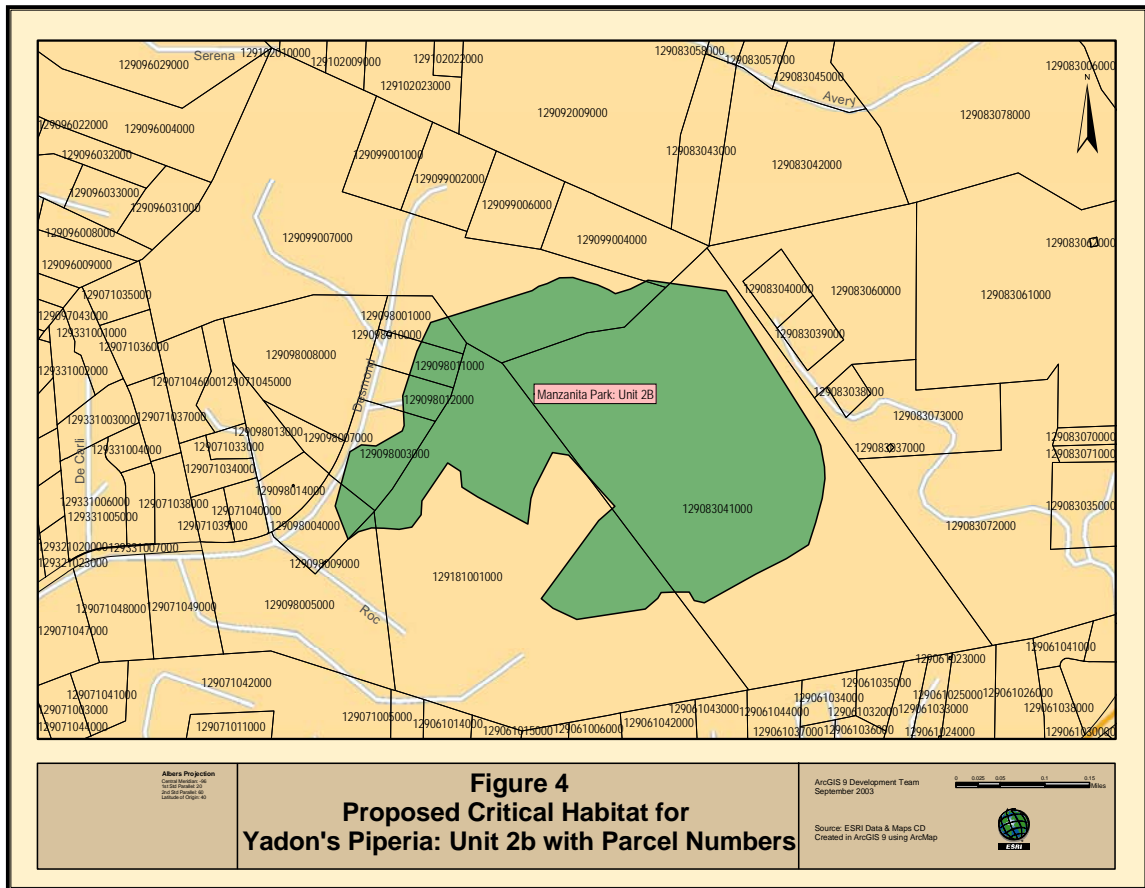
Subunit 2b consists of 83 acres of private lands. Some of the lands in this subunit were proposed for a 10 lot subdivision, residential development, and open space designation in 2000. The parcels of private land within the proposed critical habitat area are shown in the figure below.

⁴² Personal communication from Land Manager, Elkhorn Slough Foundation, December 13, 2006.

⁴³ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, December 18, 2006.

⁴⁴ Personal communication from Land Manager, Elkhorn Slough Foundation, December 13, 2006.

⁴⁵ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, December 18, 2006.



Sixty-eight acres of proposed critical habitat, within parcels 129083041000, 129181001000, and 129098005000 are owned by the same entity. These three parcels overlap the southern portion of the proposed critical habitat in the figure above. Parcels 129083041000 and 129181001000 are zoned “Rural Density Residential” with a zoning density of 20 acres per structure (RDR/20). Parcel 129098005000 is zoned RDR/5. The entire areas of parcels 129083041000, 129181001000, and 129098005000 are 66.97 acres, 83.71 acres, and 17.07 acres, respectively. According to the zoning restrictions, the maximum number of residential structures which could be built on this land according to zoning restrictions is 3, 4, and 3, respectively. Thus, according to zoning restrictions, a total of 10 residential structures could be built within the three parcels and the area of proposed critical habitat (assuming the structures are located on the land within the parcel that is also within the area of proposed critical habitat).⁴⁶

The zoning restrictions dictate the maximum number of residential structures which a developer may apply for, not what a developer may be allowed to build. An application

⁴⁶ Electronic communication from Assistant Planner, Monterey County RMA-Planning Department, December 19 and 27, 2006.

must still be submitted to and approved by the Monterey County Planning and Building Department before development can occur.⁴⁷

The entity that owns the parcels 129083041000, 129181001000, and 129098005000 completed an application with the Monterey County Planning and Building Department for a 10 lot subdivision in September of 2006. As of the writing of this report, no mitigation measures had been placed on this project. Final review of the permit application was not yet complete. Mitigation measures may still be placed on the project.⁴⁸

The application for the 10 parcels subdivision was initially submitted in 1999. Before the application was submitted, the developer was aware of the presence of environmentally sensitive habitat within the parcels. With that in mind, the subdivision was proposed only on land that had previously been used for farming; no pristine land or ridge-tops have ever been proposed for development.

Since the initial application in 1999, a botanist conducted a survey for environmentally sensitive habitat within the parcels and the County of Monterey required avoidance of environmentally sensitive areas. The developer anticipates the County of Monterey will require a conservation or scenic easement on the ridge-tops (i.e. the portion of the parcels that overlaps the area of proposed critical habitat) and that the County will approve the request to develop the low-elevation, former agricultural land. The developer anticipates the permit to be approved by the end of 2007 and to begin construction in 2008.

The developer is planning to build 10 residential units in the three parcels. Each home will be approximately 2,500 - 3,500 square feet in size, and have a sale price of approximately \$1 million or more. The developer anticipates a profit of approximately \$300,000 per home. The developer estimates that the project has been delayed 2 years due to its proximity to environmentally sensitive habitat.⁴⁹

Loss in economic surplus in the 10 parcel subdivision from delay is estimated at \$900,000.⁵⁰ Because this is an ongoing stream of costs, half of the cost of delay is assigned to the future and half to the past.

As stated above, the Monterey County Planning and Building Department may still place mitigation measures on the project. The mitigation measures that could possibly be

⁴⁷ Electronic communication from Assistant Planner, Monterey County RMA-Planning Department, December 19 and 27, 2006.

⁴⁸ Electronic communication from Assistant Planner, Monterey County RMA-Planning Department, December 19 and 27, 2006.

⁴⁹ Personal communication from parcel owner / building permit applicant, January 5, 2007 and January 18, 2007.

⁵⁰ The delay cost is calculated by multiplying lost surplus per house by the number of houses, the interest rate (15%), and the years of delay, where lost surplus per house is equal to the sale price minus construction and development costs.

placed on the project are uncertain at this point. Mitigation measures may range from simple protections, at a negligible cost, to denial of the permit.⁵¹ If the subdivision application is denied and the 10 lot subdivision is not allowed to be built, lost surplus from development could be as high as \$3,000,000. Therefore, cost of possible mitigation measures range from \$0 - \$3,000,000.

The rest of the parcels that overlap proposed critical habitat in unit 2b (129098001000, 129098012000, and 129098003000) are each owned by separate entities and are not part of the 10 lot subdivision described above.

Parcel 129098001000 is 2.5 acres in size. According to zoning density restrictions, only one home can be built in this parcel. On this parcel, a permit was submitted to the Monterey County Planning and Building Department in November 2006 to demolish a mobile home and construct a new single family dwelling. As of the writing of this report, mitigation measures may still be placed on the project. The home proposed to be built is a 3,845 square foot two-story single family dwelling with an attached 724 square foot three-car garage and 414 square feet of covered porches. The size may or may not change before the project goes through the final stage.⁵² The location of the proposed home may not be within the area of critical habitat; it could be close to the road. However, the landowner and / or building permit applicant could not be reached to confirm the location of the proposed home. The Monterey County Planning and Building Department may still place mitigation measures on the project, ranging from simple protection measures at negligible cost, to denying the permit.⁵³ If development is prohibited within this unit due to critical habitat designation, the total lost surplus from development could be approximately \$300,000.⁵⁴ Therefore costs of mitigation range from \$0 - \$300,000.

Parcel 129098012000 is approximately 2.5 acres in size. According to zoning density restrictions, only one home can be built in this parcel. On this parcel, a permit was approved by the County of Monterey for the construction of a new single family dwelling in April 2005. Conditions were placed on the project to protect and/or minimize impact to sensitive species. No mitigation measures were placed on the project.⁵⁵ Construction of the home has been completed. The location of the water tank on the parcel had to be changed to avoid impacts to sensitive manzanita plants found on the parcel and the County of Monterey required a conservation easement on the eastern portion of the

⁵¹ Personal communication from Assistant Planner, Monterey County RMA-Planning Department, January 24, 2007.

⁵² Electronic communication from Assistant Planner, Monterey County RMA-Planning Department, December 19 and 27, 2006.

⁵³ Personal communication from Assistant Planner, Monterey County RMA-Planning Department, January 24, 2007.

⁵⁴ Reasonable estimate of economic surplus provided by personal communication with developer in Monterey County, January 18, 2007.

⁵⁵ Electronic communication from Assistant Planner, Monterey County RMA-Planning Department, December 19 and 27, 2006.

parcel. Other than those alterations, the construction of the home was completed as planned. No significant losses in development surplus were incurred.⁵⁶

Parcel 129098003000 is approximately 5 acres in size. According to zoning density restrictions, two homes could be built on this parcel. Monterey County Planning and Building Department approved a permit to keep a non-permitted single family dwelling in October of 2004. The single family dwelling is 1,344 square feet with decking, a carport, and a 5,000 gallon water tank. Both conditions and mitigation measures were placed on the permit.⁵⁷ The permit was approved; therefore no significant losses in development were incurred.

Because there are no plans for new development on any of the other parcels within this area of proposed critical habitat, we can assume that potential development is too far into the future and still too hypothetical to estimate lost surplus from development opportunities.

Special management may be needed to protect the piperia and its habitat in this subunit from the threats identified in the proposed rule.⁵⁸ The costs over the next twenty years of controlling the growth and spread of invasive, non-native plant species; monitoring the area to assess the incidence of herbivory, disease, and pollinators; and installing cages around piperia to protect it from herbivores if needed could range from \$15,726 - \$18,206 in undiscounted dollars.

⁵⁶ Personal communication from parcel owner / building permit applicant, January 5, 2007.

⁵⁷ Electronic communication from Assistant Planner, Monterey County RMA-Planning Department, December 19 and 27, 2006.

⁵⁸ The Service cannot require private landowners to conduct conservation measures on their land for the piperia. However, if the development is going to avoid the proposed critical habitat (i.e. occur within the privately owned parcels, but not in the area that overlaps critical habitat), and if the private land owners are interested in reducing threats to piperia, the Service would make recommendations on how to best manage the land for conservation purposes.

Threat	Management Action	Past Cost			Future Costs					
		Undiscounted Dollars	Present Value (3%)	Present Value (7%)	Undiscounted Dollars		Present Value (3%)		Present Value (7%)	
					Low	High	Low	High	Low	High
Elimination or fragmentation of habitat from residential development	Reduce impacts to piperia (causing permit approval delay)	\$450,000	\$477,405	\$515,205	\$450,000	\$450,000	\$334,743	\$334,743	\$238,365	\$238,365
	Prevent development	\$0	\$0	\$0	\$0	\$3,300,000	\$0	\$2,454,783	\$0	\$1,748,012
Vegetation removal for fire fuel reduction purposes	Remove vegetation when piperia dormant	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Growth and spread of invasive plants	Remove invasive species from piperia habitat	\$0	\$0	\$0	\$8,826	\$8,826	\$6,575	\$6,575	\$4,694	\$4,694
Herbivory	Monitor. If necessary, install cages around piperia	\$0	\$0	\$0	\$0	\$2,480	\$0	\$2,005	\$0	\$1,585
Disease	Monitor. No actions needed until threat better understood	\$0	\$0	\$0	\$6,900	\$6,900	\$5,133	\$5,133	\$3,655	\$3,655
Lack of pollinators	Monitor. No actions needed until threat better understood	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total		\$450,000	\$477,405	\$515,205	\$465,726	\$3,768,206	\$346,451	\$2,803,239	\$246,714	\$1,996,312
Annualized Cost							\$22,609	\$182,934	\$21,765	\$176,110

Notes:

(1) Italicized costs are costs that will be incurred only if necessary after monitoring and further research.

(2) Cost of monitoring for herbivory, disease, and pollinators is presented only once in the table in the "disease" line.

(3) Monitoring cost estimate based on monitoring plan developed by Graff (2006).

(4) 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).

Subunit 2c consists of 183 acres owned by the County of Monterey within Manzanita County Park. A portion of the park within the proposed unit is used for hiking and equestrian use.⁵⁹

Development plans exist for sports fields within Manzanita Park. However, the development plans do not overlap the area proposed to be designated critical habitat within the park. No costs related to altering the development plans to avoid the species will occur. These are the only development plans within subunit 2c.⁶⁰

The California Fire Safe Council, founded in 1993, is a nonprofit organization that strives to protect homes, communities and natural resources from fire through its members and local fire safe councils.⁶¹ The Monterey Fire Safe Council, a member of the California Fire Safe Council, has identified Manzanita Park as a high priority area for fuel reduction because of the dense residential development surrounding the park.⁶² To prepare for the removal of eucalyptus, the Fire Safe Council funded a survey in 2006 to locate the piperia within the eucalyptus groves. The survey will enable the Council to avoid damaging the piperia when removing the trees. This survey cost approximately \$6,000.⁶³

Costs of removing the trees will be minimal. The Monterey Fire Safe Council is a non-profit organization that offsets as many of its costs as possible. Volunteer inmates will do the manual labor. Any additional costs of removing the trees will be offset by selling the wood.⁶⁴

Future costs of changing the fuel reduction activities to accommodate the piperia and its habitat will be minimal. Because fuel reduction in this area involves removing trees (rather than mowing or spraying) it can easily occur outside of the flowering phase of the piperia and avoid harming the species. Staff at the Monterey County Parks Department are aware of the location of the piperia and its life-cycle, and knows how to avoid harming the plant.⁶⁵

Invasive species in Manzanita Park are currently controlled by the Monterey County Agriculture Commissioners Office, Weed Division. Total costs of invasive species

⁵⁹ 71 FR 61557.

⁶⁰ Personal communication from Parks Area Manager, Monterey County Parks Department, December 11, 2006.

⁶¹ California Fire Safe Council website at: <http://www.firesafecouncil.org/about/index.cfm>, site visited December 28, 2006.

⁶² Personal communication from Parks Area Manager, Monterey County Parks Department, December 11, 2006.

⁶³ Personal communication from Ecologist hired by Monterey Fire Safe Council, December 11, 2006.

⁶⁴ Personal communication from Parks Area Manager, Monterey County Parks Department, December 11, 2006.

⁶⁵ Personal communication from Parks Area Manager, Monterey County Parks Department, December 11, 2006.

control in the piperia habitat since the efforts began three or four years ago have been about \$20,000, including the \$12,000 spent in 2006 alone. In the future, the Division plans to expand its efforts to target French broom, yellow-star thistle, and ice plant, and to expand its Jubata grass removal to areas outside the park. The Division plans to spend about \$10,000-\$15,000 every year, for an indefinite amount of years.⁶⁶

The other threats identified in this unit, including disease, herbivory, and lack of potential pollinators need to be monitored to understand how much of a threat they pose to the piperia.⁶⁷ According to a monitoring plan developed by an independent biologist hired by the Service, such a monitoring effort would require 11.5 hours each year, totaling \$345 at an hourly rate of \$30 per hour.⁶⁸

If the monitoring efforts determine that actions would need to be taken to control herbivory, the costs of purchasing and installing cages around the plants to prevent herbivory would be around \$640 initially, \$60 each year for twenty years, and \$640 ten years from now. Please see the calculation steps in the discussion of subunits 1a, 1b and 2a above. The Service recommends putting herbivore cages around a subset of individual piperia plants in the population to protect against herbivory. Caging plants may increase the size of the floral display, which can positively influence pollinator visitation. If requested by the landowner, the Service would advise that landowners continue to monitor piperia plants for diseases and abundance of pollinators, but not take any actions until these potential threats to the piperia are better understood.⁶⁹

⁶⁶ Personal communication from Weed Division Supervisor, Monterey County Agricultural Commissioner's office, December 11, 2006.

⁶⁷ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, December 12 and 28, 2006.

⁶⁸ Graff, Alison, A Long-term Monitoring Program for the Federally Endangered Yadon's Rein Orchid (*Piperia yadonii*, Orchidaceae), October 30, 2006.

⁶⁹ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, December 12 and 18, 2006.

Table 5: Estimated Economic Impacts to Monterey County, Unit 2c

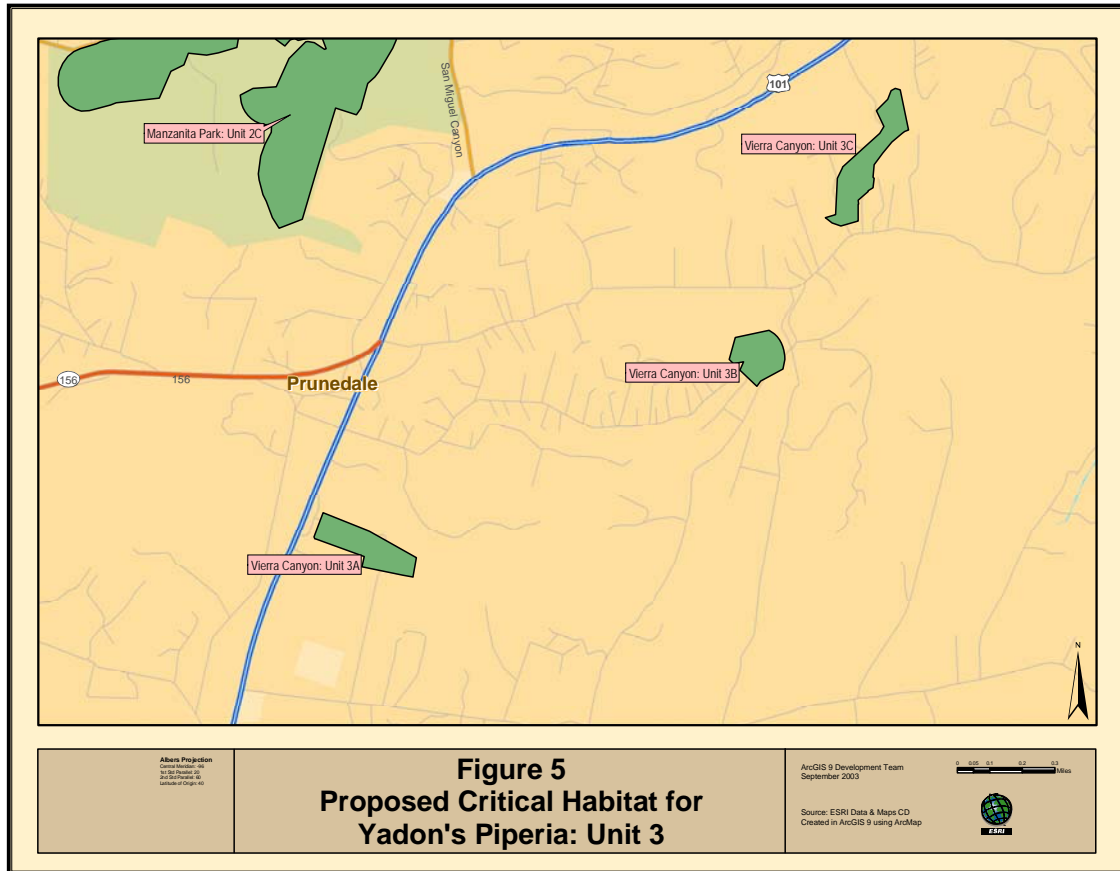
Threat	Management Action	Past Cost			Future Costs		
		Undiscounted Dollars	Present Value (3%)	Present Value (7%)	Undiscounted Dollars	Present Value (3%)	Present Value (7%)
Elimination or fragmentation of habitat from residential development	None. Determined not a threat	\$0	\$0	\$0	\$0	\$0	\$0
Vegetation removal for fire fuel reduction	Remove vegetation when piperia dormant	\$6,000	\$6,000	\$6,000	\$0	\$0	\$0
The growth and spread of invasive plant species	Remove invasive species from piperia habitat ⁽¹⁾	\$20,000	\$20,872	\$22,138	\$250,000	\$185,968	\$132,425
Herbivory	Monitor ⁽²⁾ . If necessary, install cages around piperia plants to prevent herbivory	\$0	\$0	\$0	\$2,480	\$2,005	\$1,585
Disease	Monitor ⁽²⁾ . No management actions needed until threat better understood	\$0	\$0	\$0	\$6,900	\$5,133	\$3,655
Lack of pollinators	Monitor ⁽²⁾ . No management actions needed until threat better understood	\$0	\$0	\$0	\$0	\$0	\$0
Total		\$26,000	\$26,872	\$28,138	\$259,380	\$193,106	\$137,666
Annualized Cost					\$12,602	\$12,145	

Notes:

- (1) Invasive plant species have been controlled for the past 3 to 4 years.
- (2) Cost of monitoring for herbivory, disease, and pollinators is presented only once in the table in the "disease" line.
- (3) Monitoring cost estimate based on monitoring plan developed by Graff (2006).
- (4) Italicized costs are costs that will be incurred only if necessary after monitoring and further research.
- (5) 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).

VI.C Unit 3: Vierra Canyon

Threats that may require special management in this unit are elimination or further fragmentation of habitat from development; grading or other vegetation removal (e.g. for fuel reduction purposes or roads); and the spread of invasive plant species.⁷⁰



Subunit 3a consists of 17 acres of private land overlain by a Pacific Gas and Electric Company easement.⁷¹

PG&E has three transmission lines that run through the unit, with a total of seven towers located within the unit. There is also a non-paved access road used to service the towers. PG&E does not have any plans to develop the area of proposed critical habitat. The company's transmission line corridor precludes development of reservoirs, homes, or other facilities. Elimination or fragmentation of habitat from development is therefore not considered a threat.⁷²

⁷⁰ 71 FR 61557.

⁷¹ *Ibid.*

⁷² Electronic communication from, Manager, Environmental Policy, Habitat & Species Protection, PG&E, January 4, 2007.

PG&E engages in fire fuel load reduction and maintains their road in the area of proposed critical habitat. These vegetation removal activities occur on an as needed basis. To avoid damaging the piperia, PG&E would have a biological survey for piperia performed in the area before fuel reduction or road maintenance began. Piperia occurrences would be flagged or fenced off so the plant could be protected during vegetation removal activities. In addition, vegetation removal would be done by hand and a biological monitor would be present during the work. This would enable crews to identify and avoid the piperia during the fuel reduction or road maintenance work. PG&E prefers to develop avoidance and minimization measures (i.e. hand-removal with a biological monitor present, preceded by a survey for piperia) instead of changing the timing of their fuel reduction activities to occur outside the flowering stage of piperia because it is more likely to be approved by the Fire Marshal.⁷³

The approximate cost of the biological survey to locate, flag, or fence off the piperia occurrences in preparation for each vegetation removal project is \$5,000 - \$10,000, including the cost of writing a report and managing survey data. The estimated cost of hand-removing the vegetation with a biological monitor present is \$7,500 - \$15,000.⁷⁴ It is assumed that vegetation removal for fire fuel reduction or road maintenance would occur semi-annually. The biological survey would occur with each fire fuel reduction or road maintenance event.⁷⁵

PG&E does not currently control invasive species on their land, because they have not had a problem with invasive species before. PG&E would monitor the area first, and then remove invasive species if they are found as a result of the monitoring. The estimated cost of the monitoring is \$15,600 - \$20,000 and would occur annually.⁷⁶

If invasive species are found to be a problem, the cost of removing the invasives would depend on a variety of factors including site conditions, the time of year removal would occur, the quantity of threatened or endangered plants, the quantity of invasive plants, the species type of invasive plants, and the proximity of threatened or endangered plants to the invasive plants. Costs of invasive plant removal could range anywhere from \$3,200 - \$15,000 or more.⁷⁷ It is assumed that efforts to control the spread of invasive species would occur on an annual basis.⁷⁸

⁷³ Electronic communication from, Manager, Environmental Policy, Habitat & Species Protection, PG&E, January 4, 2007.

⁷⁴ *Ibid.*

⁷⁵ Electronic communication with staff on behalf of Manager, Environmental Policy, Habitat & Species Protection, PG&E, January 4, 2007.

⁷⁶ Electronic communication from, Manager, Environmental Policy, Habitat & Species Protection, PG&E, January 4, 2007.

⁷⁷ *Ibid.*

⁷⁸ Electronic communication with staff on behalf of Manager, Environmental Policy, Habitat & Species Protection, PG&E, January 4, 2007.

Table 6: Estimated Economic Impacts to PG&E, Unit 3a					
Threat	Management Action	Past Cost	Future Costs		
			Undiscounted Dollars	Present Value (3%)	Present Value (7%)
Elimination or fragmentation of habitat from development	None. Determined not a threat	\$0	\$0	\$0	\$0
Grading or other vegetation removal (for fuel reduction or roads)	Remove vegetation when piperia dormant. Reduce impacts to piperia.	\$0	\$187,500	\$136,181	\$91,919
The growth and spread of invasive plant species	Monitor annually for invasive species	\$0	\$356,000	\$264,819	\$188,573
	Remove invasive species from piperia habitat	\$0	<i>\$182,000</i>	<i>\$135,385</i>	<i>\$96,406</i>
Total		\$0	\$725,500	\$536,386	\$376,898
Annualized Cost				\$35,003	\$33,249

Notes:

(1) Italicized costs are costs that will be incurred only if necessary after monitoring.

(2) 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).

Subunit 3b consists of 12 acres of lands owned by the California Department of Transportation (Caltrans). **Subunit 3c** consists of 21 acres of State lands also owned by Caltrans. The lands in these subunits were part of a previous study area for a highway alignment. The alignment was eventually excluded from further consideration and the State retains the lands.⁷⁹

Caltrans is currently holding this land to use as mitigation for future road construction projects elsewhere. It anticipates being able to own the land for the next 20 years. Caltrans does not plan to develop this land in any way, nor does it intend to remove any vegetation for roads or fuel reduction purposes.⁸⁰ The Service has indicated that if the landowner does not think development or vegetation removal is a threat to the piperia on

⁷⁹ 71 FR 61557.

⁸⁰ Personal communication from Associate Biologist, California Department of Transportation (Caltrans), December 12, 2006.

its land, then no further management actions are needed.⁸¹ Therefore, the cost of managing these potential threats are not calculated for this report.

Caltrans currently monitors the status of invasive species on their land, but does not control the spread of the invasive plant species. Monitoring efforts involve one or two biologists visiting the site every year or every other year. No efforts have been made to map the weeds or estimate how extensive their spread has been. Costs of the monitoring efforts have been approximately \$1,000 per year, for the past seven years.⁸²

Caltrans believes that a program will need to be developed and implemented to control the spread of invasive plants in order to conserve the piperia in units 3b and 3c. However, Caltrans could not estimate what such a program would cost.⁸³ This analysis assumes management actions needed to control the spread of invasive plant species will be similar to those implemented by the Elkhorn Slough Foundation.⁸⁴ Using the per-acre cost of controlling invasive species from the Foundation, the total cost of controlling invasive species on the thirty-three acres owned and managed by Caltrans will be approximately \$3,533 in undiscounted dollars over the next twenty years, assuming control of invasive, non-native plant species takes place every year.

⁸¹ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, December 18, 2006.

⁸² Personal communication from, Associate Biologist, California Department of Transportation (Caltrans), December 12, 2006.

⁸³ *Ibid.*

⁸⁴ Assumption made at the advice of the Service: Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, December 20, 2006.

Threat	Management Action	Past Cost			Future Costs		
		Undiscounted Dollars	Present Value (3%)	Present Value (7%)	Undiscounted Dollars	Present Value (3%)	Present Value (7%)
Elimination or fragmentation of habitat from development	None. Determined not a threat	\$0	\$0	\$0	\$0	\$0	\$0
Grading or other vegetation removal (for fuel reduction or roads)	None. Determined not a threat	\$0	\$0	\$0	\$0	\$0	\$0
The growth and spread of invasive plant species	Remove invasive species from piperia habitat ⁽¹⁾	\$7,000	\$7,662	\$8,654	\$3,533	\$2,638	\$1,890
Total		\$7,000	\$7,662	\$8,654	\$3,533	\$2,638	\$1,890
Annualized Cost					\$172	\$167	

Notes:

(1) Cost of invasive species control is estimated by multiplying the cost per acre to control invasive species on Elkhorn Slough Foundation land by the number of acres of Caltrans land.

(2) 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).

VI.D Unit 4: Aguajito

Threats that may require special management in this unit are fragmentation of habitat from development and the colonization and spread of invasive plant species.⁸⁵

Subunit 4a consists of 77 acres of private land owned by the Pebble Beach Company (PBC). Lands in and/or adjacent to this subunit and subunit 4b are proposed for preservation in the PBC's recent development plan, but the configuration of the preservation plan is not yet determined. **Subunit 4b** also consists of 77 acres of private lands owned by the PBC and proposed for preservation.⁸⁶

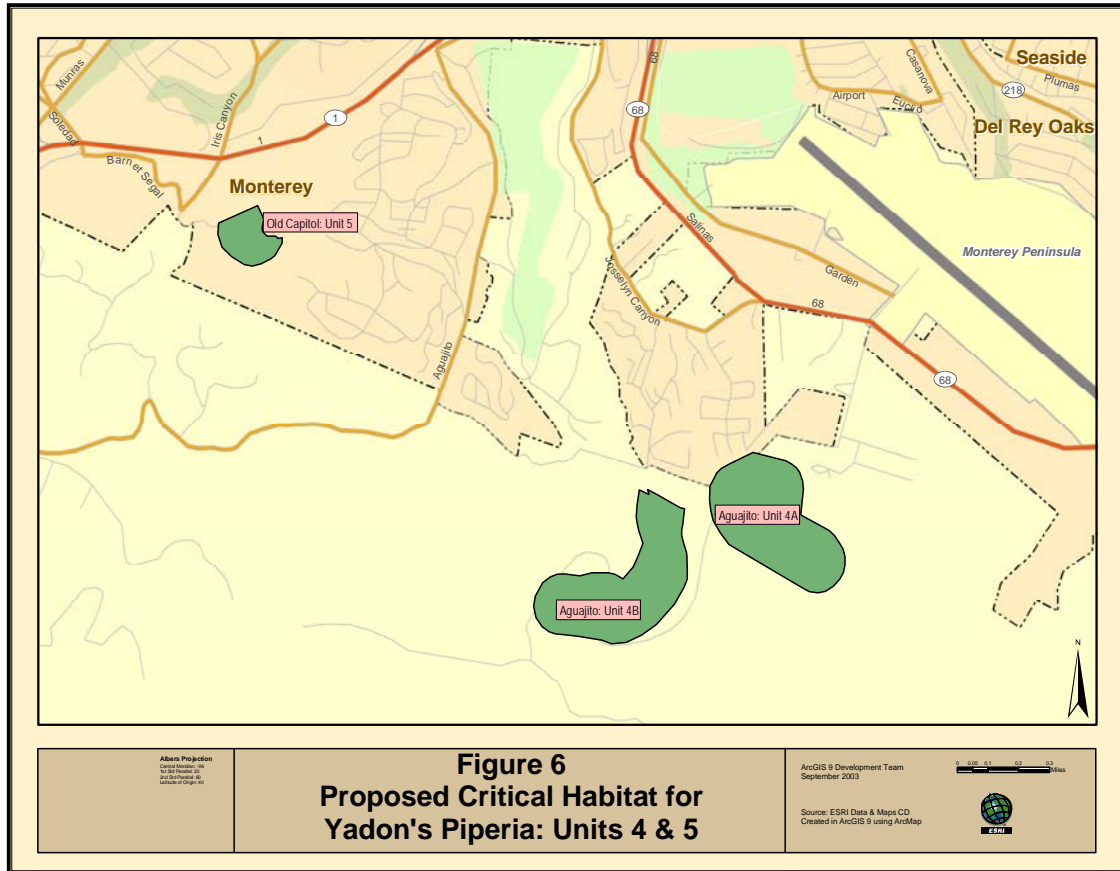
Because PBC is the landowner and manager of units 4a, 4b, and 5 and the threats to the piperia in these three subunits are similar, they are discussed together in section VI.E below with unit 5.

⁸⁵ 71 FR 61558.

⁸⁶ *Ibid.*

V.I.E Unit 5: Old Capitol

Threats that may require special management in this unit are fragmentation or loss of habitat from development, habitat degradation by motorized vehicles and encampments, debris dumping, and competition from nonnative invasive plants.⁸⁷



This unit consists of 16 acres of private land owned by the PBC proposed for preservation in the PBC's recent Del Monte Forest Preservation and Development Plan (DMF/PDP).⁸⁸

In The Pebble Beach Company's DMF/PDP Final Environmental Impact Report (EIR), the entire Old Capitol site (unit 5) and the occupied habitat in the Aguajito site (units 4a and 4b) were proposed to be preserved in order to mitigate the impacts of the proposed development project.⁸⁹ Impacts associated with fragmentation or loss of habitat are not

⁸⁷ *Ibid.*

⁸⁸ *Ibid.*

⁸⁹ Monterey County, Pebble Beach Company's DMF/PDP Final EIR, pp. 2-89 and 2-90.

anticipated as long as these units are dedicated to preservation, as is required in the DMF / PDP EIR.

There were several Mitigation Measures outlined in the Final EIR designed to mitigate the impacts of development. Mitigation Measure BIO-B1-2c required that the entire Old Capitol site be preserved and the piperia population at the site enhanced. Mitigation Measure BIO-D1-3 required a survey for piperia plants be conducted on the Aguajito site in 2005. Based on the results of the survey, occupied habitat areas and 50-foot buffers surrounding them were to be designated as preservation areas.⁹⁰

Because these habitat units were required to be permanently dedicated as “additionally-required preservation areas” in the PBC’s DMF/PDP,⁹¹ fragmentation or loss of habitat from development is no longer a threat to the species.

Competition from nonnative invasive plants was identified as a threat to the species in units 4a, 4b, and 5. Habitat degradation by motorized vehicles and encampments and debris dumping were identified as threats in unit 5. These threats are addressed in Mitigation Measure BIO-D1-5 of The Pebble Beach Company’s DMF/PDP, which required management of proposed Preservation, Conservation, and Resource Management Areas to sustain piperia populations, protect populations from threats, and minimize indirect impacts of existing and proposed development. Old Capitol and Aguajito are considered Resource Management Areas under Mitigation Measure BIO-D1-5.

The PBC is already managing the threats identified in units 4 and 5.

A comprehensive program of non-native, invasive species control is conducted on all PBC properties. The program includes monitoring the non-native species removal as well as controlling the invasive species. An annual budget for this program that can be directly attributed to reducing the threats to piperia in units 4 and 5 is about \$48,588.

Site clean up and restoration activities at the Old Capitol site (unit 5) include installation of vehicle barriers, removal of unnecessary roads and trails, removal of encampment areas and debris, and restoration of disturbed areas. The annual cost of these activities is approximately \$37,400.⁹²

⁹⁰ Monterey County, Pebble Beach Company’s DMF/PDP Final EIR, pp. 2-89 and 2-90.

⁹¹ Monterey County, Pebble Beach Company’s DMF/PDP Partial Revision to the Draft EIR, September 2004, p. P2-14 and P2-15 and Final EIR, pp. 2-89 and 2-90.

⁹² Biological Consultant for the Pebble Beach Company, cost estimate provided via electronic communication, March 5, 2007.

Table 8: Estimated Economic Impacts to the Pebble Beach Company, Units 4a, 4b, and 5

Threat	Mitigation Measure	Management Action	Past Cost	Future Costs		
				Undiscounted Dollars	Present Value (3%)	Present Value (7%)
The growth and spread of invasive plant species Elimination or fragmentation of habitat from development	BIO-B1-1 & BIO-D1-5	Manage preservation areas. Protect existing piperia populations from threats	\$0	\$971,760	\$722,867	\$514,742
	BIO-D1-3	Units 4 and 5 dedicated to preservation for mitigation	\$0	\$0	\$0	\$0
Habitat degradation by motorized vehicles and encampments (Unit 5 only)	BIO-B1-1 & BIO-D1-5	Manage preservation areas. Protect existing piperia populations from threats	\$0	\$748,000	\$556,418	\$396,216
Debris dumping (Unit 5 only)	BIO-B1-1 & BIO-D1-5	Manage preservation areas. Protect existing piperia populations from threats	\$0	Included in Cost Above		
Total			\$0	\$1,719,760	\$1,279,284	\$910,958
Annualized Cost					\$83,483	\$80,363

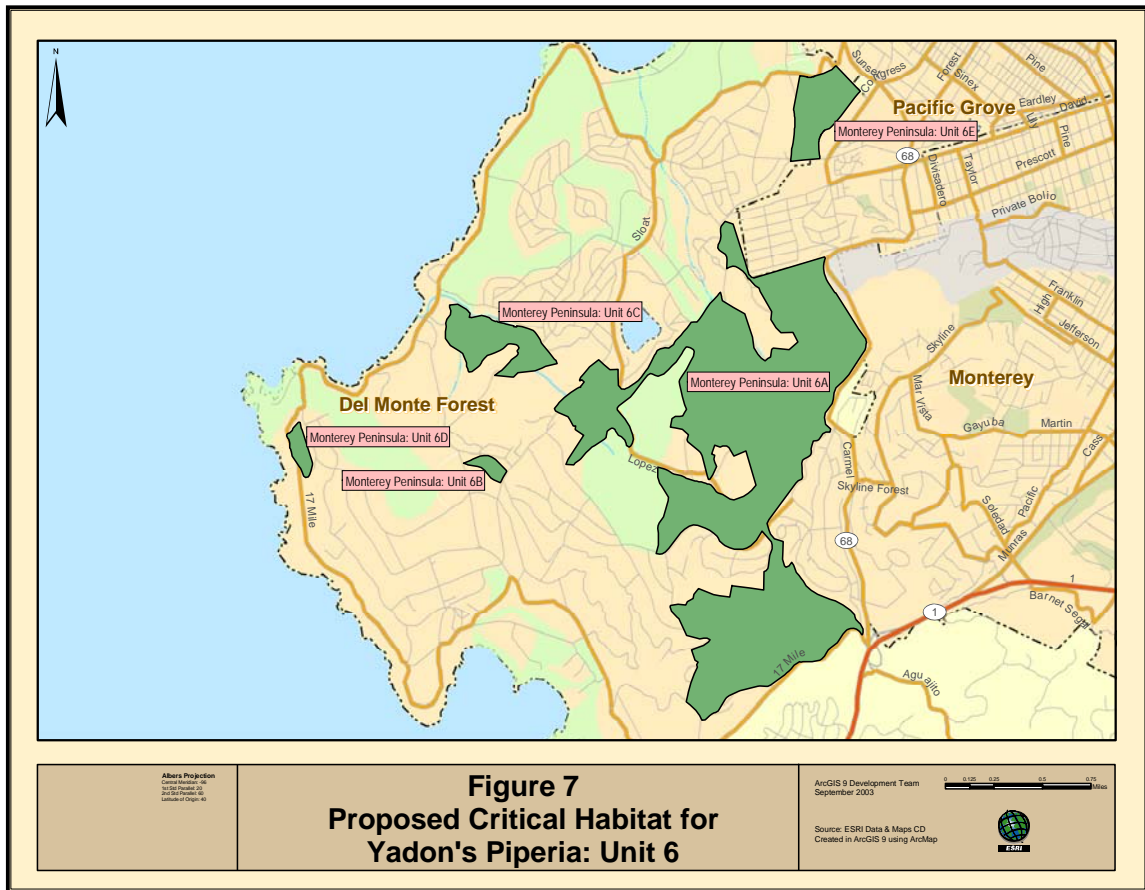
Notes:

- (1) The cost of removing debris is included in the cost of removing encampments above.
- (2) 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).

VI.F Unit 6: Monterey Peninsula

Threats that may require special management in this unit are: Adverse effects from adjacent existing and future development, including the loss of adjacent forest canopy, increased trampling, potential hydrologic changes, overspray of pesticides, the introduction of pathogens or disease, mowing, and the introduction and spread of invasive plant species; continuing high and/or increasing deer populations resulting in high herbivory levels; and increased growth of understory vegetation due to exclusion of wildfire.⁹³

⁹³ 71 FR 61558.



Subunit 6a consists of 823 acres of private land owned by the PBC and 81 acres of private land owned by the Del Monte Forest Foundation (DMFF). Protected lands in this area include the SFB Morse Botanical Reserve (owned by the DMFF) and the Huckleberry Hill Natural Reserve (easement held by the DMFF). It also includes land identified in the PBC’s most recent development proposal for preservation or conservation. The DMFF conducts some monitoring and removal of nonnative plant populations.

Subunit 6b consists of 9 acres of private land owned by the PBC. It is identified in PBC’s most recent development proposal as the Bristol Curve Conservation Area.

Subunit 6c consists of 23 acres of private lands owned by the DMFF and 47 acres of private land owned by the PBC.

Subunit 6d consists of 12 acres of private land owned by the DMFF.

Subunit 6e consists of 19 acres owned by the City of Pacific Grove, 29 acres of private land owned by the DMFF, and 13 acres owned by the PBC.⁹⁴

It is beneficial at this point to explain the overall plan for development and preservation proposed by the PBC and the efforts that have been made in the past to understand the extent of the population of piperia in the area.

The current project is being proposed by the PBC, the successor company of those who originally developed the Del Monte Forest. The currently proposed project is the third proposal for a combination of development and preservation on the PBC's undeveloped land in the Del Monte Forest. The first proposal for build out, the Pebble Beach Lot Program, proposed 403 residential units on 685 acres, 53 low-cost housing units, an 18-hole golf course, and expansion of an existing driving range.

The second proposal for build out, known as Refined Alternative 2, was a revision of the Pebble Beach Lot Program in response to public and agency comments. Refined Alternative 2 reduced the number of housing units to 364, relocated some housing units, and moved the golf course from Area PQR to Area MNOUV (see figure below). The relocation of the golf course required the Pebble Beach Equestrian Center be moved to the Sawmill Site near the City of Pacific Grove.

The Pebble Beach Lot Program and Refined Alternative 2 were analyzed in a Final Environmental Impact Report (FEIR) in 1997. However, in 1999, the ownership of the Pebble Beach Company changed hands, the project application was withdrawn and the FEIR was not certified by the Monterey County Planning Commission.

In November of 2000, the Del Monte Forest Plan: Forest Preservation and Development Limitations (Measure A) was passed by the voters of Monterey County. Measure A resulted in the following changes to the Del Monte Forest Local Coastal Program (LCP):

- Increase forest open space by approximately 217 acres;
- Increase designated recreational open space by about 220 acres;
- Decrease the residential unit development potential allowed under the LCP's land use designations by 856 lots from 7 planning areas with a decrease in density from medium to low, subject to other resource policies in the plan;
- Increase potential visitor-serving use with deletion of the specified limits of visitor-serving units at two locations in the Del Monte Forest and designation of an additional area (4 acres) of visitor-serving commercial use;
- Remove the Resource Constraint Overlay from much of the Pebble Beach Company owned constrained property in the Del Monte Forest.

The currently Proposed Project (referred to as the Pebble Beach Company Del Monte Forest Preservation and Development Plan, or PBC DMF / PDP, in this report) is designed to meet the changes in the LCP according to Measure A. The Proposed Project,

⁹⁴ 71 FR 61558-9.

as compared to the Pebble Beach Lot Program and Refined Alternative 2, would reduce the number of housing units in the Del Monte Forest, increase the number of visitor-serving units, and dedicate larger areas for preservation of open space and habitat. The Proposed Project proposes a golf course in Area MNOUV and proposes to relocate the Equestrian Center to the Sawmill site.⁹⁵

The reduction in development occurred for a number of reasons, including the public and agency comments on the Pebble Beach Lot Program and the changes in the LCP due to the passage of Measure A. Although developers have incurred impacts due to losses in revenue associated with the reduction in permissible development, the presence of the piperia on the property was incidental to the other driving factors mentioned above. Consequently, this analysis does not recognize any economic impacts that are coextensive with the proposed designation of critical habitat in this particular area.

Table 9 presents the differences in the three plans for development and preservation in the Del Monte Forest.

⁹⁵ Monterey County, Pebble Beach Company's DMF/PDP Final EIR, January 2005, p. ES-2 - ES-4.

Table 9: Comparison of Proposals for Development and Preservation in Del Monte Forest

Land Use	Pebble Beach Lot Program	Refined Alternative 2	Proposed Project
Golf Course	New golf course and driving range in Area PQR	New golf course in Area MNOUV	New golf course in Area MNOUV New driving range at Spanish Bay
Equestrian Center	In existing location	Relocated to Sawmill Site	Relocated to Sawmill Site
Visitor-Serving Units	0	0	160 new units
Additional Visitor-Serving Meeting and Hospitality Space	0	0	~17,790 sq. feet
Residential Lots and Townhouses	403	364	33 new lots
Employee Housing Units	0	0	60
Inclusionary Housing Units	53, included in 403 total above	48, included in 364 total above	14 included in employee housing total above
Preservation (acres)	25	254	436
Conservation (acres)	52	31	56
Resource Management (acres)	204	114	32
All habitat areas (acres)	281	399	524

Notes:

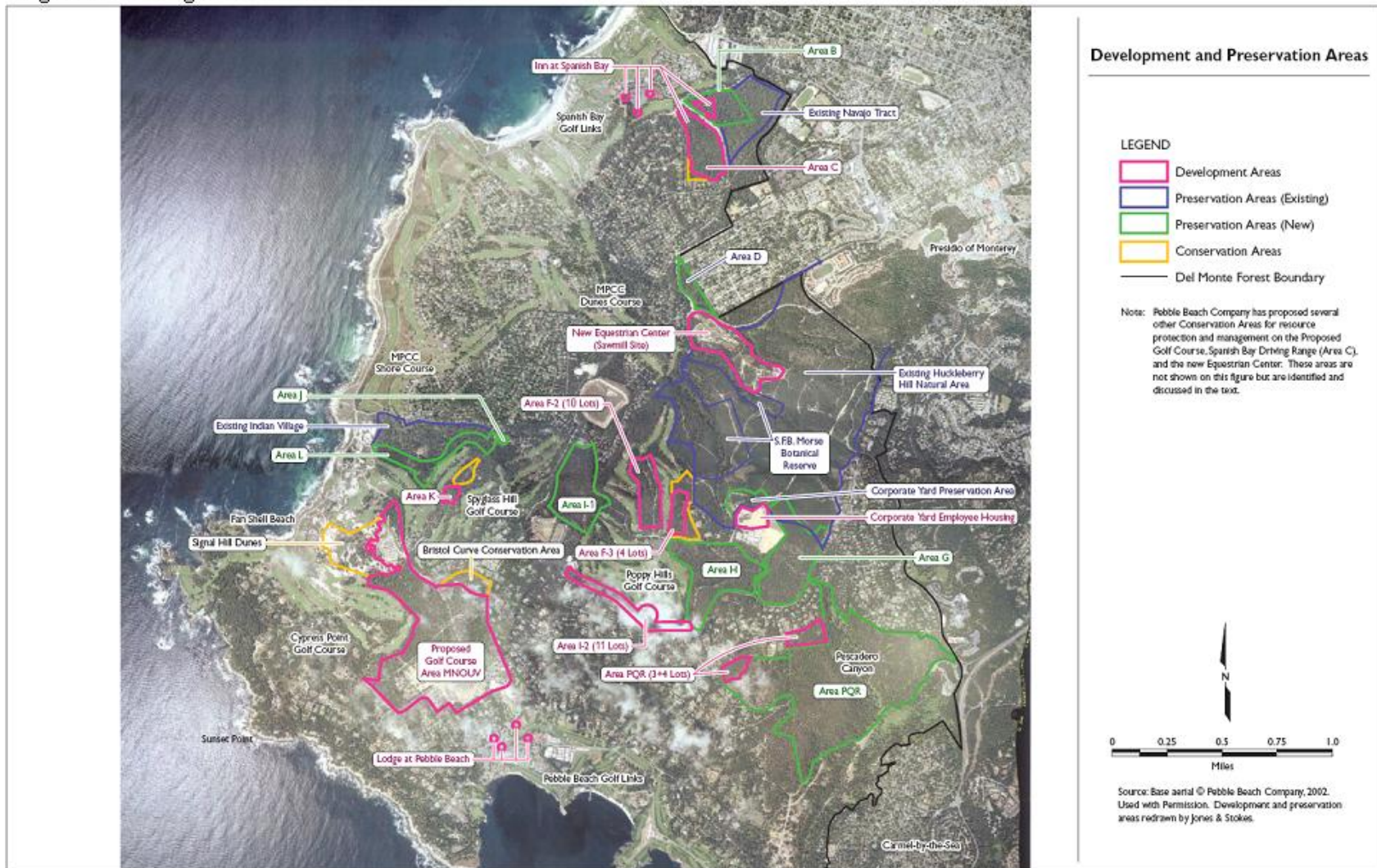
- (1) Preservation is defined as areas not within development site boundaries to be managed for the sole purpose of preservation of natural resources. Project totals do not include the Huckleberry Hill Natural Area which was previously dedicated by the PBC in relation to implementation of the DMF Land Use Plan and permit conditions for the original Spanish Bay resort project.
- (2) Conservation is defined as areas within development site boundaries that are separable from development and can be managed for natural resources.
- (3) Resource Management areas are defined as areas within development site boundaries that are not separable from development, but that would be managed for natural resources and for adjacent land use purposes.

Source:

- (1) Monterey County, Pebble Beach Company's DMF/PDP FEIR, January 2005, p. ES-5.

The figure below shows the location of the development areas and the areas of preservation and conservation.

Figure 8: Existing and New Preservation Areas



Source: Pebble Beach Company's DMF/PDP, Final EIR, January 2005, Figure ES-2.

In addition to scaling back development and increasing preserved areas overall, there are certain steps outlined in the EIR that are directly related to conserving habitat for the piperia and protecting the piperia from impacts of development and other threats.

The EIR identified several indirect impacts of the proposed development on piperia that could possibly lead to losses of piperia or suitable habitat. Those indirect effects, which are very similar to the threats to the piperia identified in the Proposed Rule, are:

- Loss of adjacent suitable, but presently unoccupied habitat, limiting the ability of the piperia to colonize suitable adjacent areas;
- Fragmentation of existing piperia habitat into smaller separate habitat areas;
- Increased edge impacts such as changes in microclimate (like increased light levels, decreased soil moisture, etc.) potential increased seed predation by birds, potential vulnerability to wind damage and wind-throw, and potential changes in pollination success;
- Trampling of plants by humans, equestrians, and pets;
- Mowing and other road maintenance activities;
- Changes in soil and hydrologic conditions from increased irrigation and runoff;
- Increased exposure to fertilizers and herbicides from the golf course, driving range, and adjacent residential areas;
- Spread of invasive non-native plants from adjacent landscaped areas that may displace the piperia; and
- Potential for increased herbivory and browsing from deer and rabbits.⁹⁶

The EIR states that the Proposed Project would have a substantial adverse effect on the piperia without mitigation. However, after mitigation, the EIR indicates that the project will have a less than significant impact on the piperia and will not hinder the recovery of the species.⁹⁷

The proposed project will include preservation and conservation of large tracts of occupied habitat for the piperia. In addition, a “comprehensive suite” of mitigation measures were developed, which are summarized in the table below. The effect of the measures would be to reduce the potential for indirect impacts in areas of retained habitat and to sustain the populations within the managed areas.⁹⁸

⁹⁶ Monterey County, Pebble Beach Company’s DMF/PDP Partial Revision to the Draft EIR, September 2004, p. P2-6.

⁹⁷ Monterey County, Pebble Beach Company’s DMF/PDP Partial Revision to the Draft EIR, September 2004, p. P2-22.

⁹⁸ Source for all Mitigation Measures below: Monterey County, Pebble Beach Company’s DMF/PDP Partial Revision to the Draft EIR, September 2004, pp. P2-13 – P2-21.

Table 10: Mitigation Measures in the PBC DMF / PDP

Mitigation		
Measure	Goal / Topic	Actions
BIO-D1-1	Avoidance	Avoid removal of Yadon’s piperia within all residential subdivisions, in the path of utility installation to the New Equestrian Center, the recreational trail of F-3, and at the new Equestrian Center.
BIO-D1-2	Minimization	Redesign the Stevenson Drive Realignment
BIO-D1-3	Preservation	The Pebble Beach Company shall permanently dedicate additional preservation areas for Yadon’s piperia. In addition to the applicant-proposed preservation areas, the applicant shall be required to permanently dedicate all of the areas that it owns for preservation. These areas include: <ul style="list-style-type: none"> ▪ Bristol Curve ▪ Area K ▪ Old Capitol ▪ Aguajito
BIO-D1-4	Piperia Plan	The Pebble Beach Company shall fund and implement a long-term Piperia Plan including transplantation, enhancement, and adaptive management elements to offset project losses of piperia range and extent. The Pebble Beach Company has the responsibility to fund and implement the final plan for at least 20 years.
BIO-D1-5	Resource Management	Manage proposed preservation, conservation, and resource management areas to sustain existing piperia populations, protect existing populations from threats, and minimize indirect impacts of existing and proposed development. Measures include: <ul style="list-style-type: none"> ▪ Conduct annual monitoring and removal of invasive non-native species ▪ Conduct maintenance outside the leafing and flowering period ▪ Control irrigation and site drainage at the Proposed Golf Course to avoid excessive runoff ▪ Adopt integrated pest management methods for the Proposed Golf Course to reduce pesticide drift and runoff ▪ Fence off the perimeter of the piperia populations adjacent to the Proposed Golf Course or otherwise indicate this area as out of play ▪ Develop and implement an environmental awareness education program ▪ Close and restore informal trails within existing piperia habitat ▪ Monitor piperia within preservation, conservation, and resource management areas annually for ten years, and at least every other year through the 20-year period

The applicant-proposed and additionally-required preservation areas closely overlap with the areas of proposed critical habitat as demonstrated in the table below.

Table 11: Comparison of Preservation Areas in DMF/PDP with PCH Units	
Proposed Preservation or Conservation Area	Corresponding PCH Unit
Bristol Curve / Area MNOUV	Unit 6b
Area B	Unit 6e
Area D	Unit 6a
Area F-3	Unit 6a
Area G	Unit 6a
Area H	Unit 6a
Area I-1	Unit 6a
Area PQR	Unit 6a
Area J	Unit 6c
Area K	Unit 6c
Area L	Unit 6c
Old Capitol Site	Unit 5
Agujito	Units 4a and 4b
<p>Note:</p> <p>(1) Unit 6d, which is owned by Del Monte Forest Foundation does not correspond to a proposed preservation or conservation area in Pebble Beach Company's DMF/PDP.</p> <p>Source:</p> <p>(1) Monterey County, Partial Revision to the Draft EIR, September 2004, p. P2-15, and Figure 1.</p>	

The Pebble Beach Company has funded multiple surveys and reports to understand the extent of the piperia population in the area of the proposed development and preservation plan. A survey was conducted in 2004 by Ecosystems West Associates which characterized the distribution and abundance of piperia by site and counted individual plants to characterize population loss.⁹⁹ A Best Management Practices Plan was developed by Questa Engineering in 2003 to assist the Pebble Beach Company in minimizing impacts of pesticides and runoff from the proposed golf course.¹⁰⁰

The feasibility of salvaging and transplanting was studied and the results were discussed in the Transplantation, Enhancement, and Adaptive Management (TEAM) Plan for Yadon's piperia. The County determined that transplantation was an effective form of

⁹⁹ Monterey County, Pebble Beach Company's DMF/PDP Partial Revision to the Draft EIR, September 2004, p. P2-4, appendix E.

¹⁰⁰ Monterey County, Pebble Beach Company's DMF/PDP Partial Revision to the Draft EIR, September 2004, p. P2-7.

mitigation only in area MNOUV.¹⁰¹ The TEAM Plan is to serve as the basis for the final Piperia Plan required under Mitigation Action BIO-D1-4.¹⁰²

Many of the threats to the piperia in unit 6 identified in the Proposed Rule on land owned by the Pebble Beach Company will be addressed through the conservation, preservation and resource management actions outlined in the DMF/PDP EIR. To restate, the threats identified in the Proposed Rule in unit 6 are:

- Adverse effects from adjacent existing and future development, including the loss of adjacent forest canopy, increased trampling, potential hydrologic changes, overspray of pesticides, the introduction of pathogens or disease, mowing, and the introduction and spread of invasive plant species;
- Continuing high and/or increasing deer populations resulting in high herbivory levels; and
- Increased growth of understory vegetation due to exclusion of wildfire.¹⁰³

Pebble Beach Company's activities to manage threats to the piperia can be grouped into several categories:

- Ongoing open space management and maintenance;
- Golf course (and residential area) management and maintenance;
- Site clean up and restoration; and
- Monitoring and patrolling.

Ongoing open space management and maintenance includes a comprehensive program of non-native, invasive species control on all PBC properties. An annual budget for this program that can be directly attributed to reducing the threats to piperia in unit 6 is about \$143,450. Similarly, establishing and maintaining trails, controlling access, and controlling runoff and erosion are ongoing activities on PBC lands. An annual budget for these activities that can be directly attributed to reducing the threats to piperia in unit 6 is about \$14,400.

Additional activities for PBC's existing golf course management and maintenance program, specifically directed at reducing threats to piperia, include controlling overspray of chemical fertilizers and pesticides; avoiding mowing in rough areas adjacent to fairways and residences until after seed dispersal; and educating golf course personnel and Del Monte Forest residents. Annual costs for these additional activities in golf course (and residential) areas adjacent to piperia habitat are about \$58,000.

Finally, the PBC hires two monitors, at an annual cost of \$20,800 each, to survey for herbivory and understory growth. These monitors will install cages, enclosures, and/or fences in the event that herbivory creates a substantial threat.¹⁰⁴

¹⁰¹ Monterey County, Pebble Beach Company's DMF/PDP Partial Revision to the Draft EIR, September 2004, p. P2-7 and P2-8.

¹⁰² Jones and Stokes, Memorandum: Updates to Draft TEAM Plan for Piperia Plan, September 15, 2004, included in the Partial Revision to the Draft EIR as Appendix I.

¹⁰³ 71 FR 61558.

Table 12: Estimated Economic Impacts to the Pebble Beach Company, Units 6a, 6b, 6c, 6e

Threat	Management Action	Past Cost	Future Costs		
			Undiscounted Dollars	Present Value (3%)	Present Value (7%)
Adverse effects from adjacent existing and future development	See below:	\$0			
The introduction and spread of invasive plant species	Control invasive species in the habitat	\$0	\$2,869,000	\$2,134,174	\$1,519,711
Loss of adjacent forest canopy	None. No management actions can be taken	\$0	\$0	\$0	\$0
The introduction of pathogens or disease	None. No management actions can be taken	\$0	\$0	\$0	\$0
Increased trampling	Establish trails and direct people towards those trails	\$0	\$288,000	\$214,236	\$152,554
Potential hydrologic changes	Ensure runoff is controlled	\$0	included in cost above		
Overspray of pesticides	Ensure pesticide use is controlled. Educate landowners and golf course management personnel	\$0	\$1,160,000	\$862,894	\$614,453
Mowing	Mow when piperia dormant. Reduce impacts to piperia.	\$0	included in cost above		
Herbivory	Monitor. If necessary, install cages around piperia plants to prevent herbivory	\$0	\$416,000	\$309,451	\$220,355
Increased understory growth due to exclusion of wildfire	Monitor. No management action needed until threat better understood.	\$0	\$416,000	\$309,451	\$220,355
Total		\$0	\$5,149,000	\$3,830,206	\$2,727,429
Annualized Cost				\$249,951	\$240,607

Notes:

(1) The cost of maintaining trails, redirecting people away from piperia, and controlling runoff and erosion is presented in the table as one cost. The cost of controlling pesticides and mowing activities is also presented in the table as one cost.

(2) 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).

¹⁰⁴ Biological Consultant for the Pebble Beach Company, cost estimate provided via electronic communication, March 5, 2007.

The Robert Louis Stevenson School

The Stevenson School is a non-profit, non-sectarian, independent, K-12 school that owns 4.7 acres in unit 6A. The Stevenson School has plans to develop a portion of its campus (called the “Forested Area” in its Master Plan) into an athletic field. The Master Plan for the Campus was developed in the 1980’s and submitted to and approved by the Monterey County Board of Supervisors in 1983. The Master Plan, which includes plans for new educational facilities, residence halls, as well as athletic facilities, has been implemented in stages since 1983.¹⁰⁵

The Forested Area is proposed to be designated critical habitat. Although the Stevenson School has not developed the Forested Area yet, it may do so in the future, as planned out in the Master Plan. The Stevenson School currently uses a near-by athletic field owned by the PBC called Collins Field. However, the PBC can revoke this agreement at any time. The Stevenson School plans to develop the Forested Area according to the timeline laid out in the Master Plan to ensure its students are guaranteed an on-campus athletic field to use. If the PBC revokes its agreement and the Stevenson School cannot develop the Forested Area, the alternatives – according to the Stevenson School – include bussing students to an alternative field or eliminating some sports programs.¹⁰⁶

This economic analysis considers the following scenario: the Stevenson School has plans for developing the Forested Area into an athletic field in its Master Plan and would develop the field absent critical habitat. According to the Stevenson School’s public comment, the agreement between the PBC and the Stevenson School is considered a stop-gap measure intended to be in place until the Stevenson School develops its own athletic field or until the PBC wants to develop Collins Field for its own purposes.¹⁰⁷ When the Stevenson School initiates development of the Forested Area, it will require a permit from the Monterey County Planning and Building Department. If the Forested Area has been designated critical habitat for the piperia, the County will require not only a building permit, but also a discretionary permit and an environmental review (which would include a biological report). If the proposed development is 100 feet or less away from the environmentally sensitive habitat (which would probably be the case, according to the design figures in the Stevenson School’s public comment¹⁰⁸), then CEQA mitigation requirements will come into effect. Under CEQA, an initial study would be required, which would determine the level of impact of the proposed development on the environmentally sensitive habitat area. If the impacts are determined to be substantial, then the Stevenson School would be required to do an EIR, which would identify mitigation measures, pursuant to CEQA, to place on the development. The mitigation measures could involve establishing a conservation area, donating money to a

¹⁰⁵ Joe Wandke, President of the Stevenson School, Public Comments RE: Proposed Designation of Critical Habitat for *Piperia yadonii* (Yadon’s piperia), December 18, 2006, p. 3.

¹⁰⁶ *Ibid*, pp. 4-5.

¹⁰⁷ *Ibid*, p. 4.

¹⁰⁸ *Ibid*, Exhibits 1 and 2.

conservation organization, transplanting piperia plants, reducing or moving the development, or denial of the development permit.¹⁰⁹

The outcome of the County permit application process and the CEQA process are difficult to ascertain and therefore difficult to quantify given the information currently available.

The Del Monte Forest Foundation

Del Monte Forest Foundation (DMFF) owns 81 acres in unit 6a, including the SFB Morse Botanical Reserve and the Huckleberry Hill Natural Reserve. Del Monte Forest Foundation also owns 23 acres in unit 6c, all of unit 6d (12 acres), and 29 acres in unit 6e.

The DMFF has encouraged research on its land that will serve to better understand piperia ecology and how to optimally manage piperia habitat. Although the DMFF has allowed researchers access to its lands, the DMFF has not funded any of these studies. The DMFF has only contributed a small amount of funds to a survey effort that was conducted by the Pebble Beach Company approximately 2 years ago for its DMF / PDP. The DMFF estimates that it contributed approximately \$1,000 to the survey effort.¹¹⁰

The threats identified by the Service in this unit are: adverse effects from adjacent existing and future development, including the loss of adjacent forest canopy, increased trampling, potential hydrologic changes, overspray of pesticides, the introduction of pathogens or disease, mowing, and the introduction and spread of invasive plant species; herbivory from continued high or growing deer populations; and increased growth of understory vegetation due to exclusion of wildfire.¹¹¹ The Service notes that the loss of adjacent forest canopy and the introduction of pathogens and disease cannot be avoided; no actions are identified to address these threats.¹¹²

Because the understory ecology may vary dramatically across the various subunits in unit 6, the Service recommends monitoring each unit for understory growth caused by the exclusion of wildfire, but not taking any actions until the specific understory dynamics are better understood.¹¹³ To control herbivory, the Service recommends monitoring the areas of proposed critical habitat, then installing herbivory-prevention cages if necessary.

¹⁰⁹ County permit review process and CEQA requirements come from: Personal communication from Assistant Planner, Monterey County RMA-Planning Department, June 20, 2007.

¹¹⁰ Personal communication from Forester, Staub Forestry and Environmental Consultants, January 23, 2007.

¹¹¹ 71 FR 61558.

¹¹² Personal communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 11, 2007.

¹¹³ Electronic communication with Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 11, 2007.

Because the piperia’s lifecycle and specific habitat needs are not well understood, the DMFF has not taken actions to actively manage habitat for the piperia in particular. However, the DMFF does actively manage its open space lands. It’s current efforts involve maintaining trails to keep pedestrians from trampling in environmentally sensitive habitat areas; controlling stormwater and pesticide runoff from adjacent development; controlling invasive plant species, especially where they are significantly contributing to understory growth; monitoring their lands for herbivory patterns and other purposes; and paying in-house biologists and botanists to conduct surveys and identify sensitive plant species before the start of projects that involve vegetation removal and mowing.

The DMFF’s current open space active management efforts are essentially already controlling the threats the Service identified in lands owned by the DMFF. The DMFF is in charge of maintaining the habitat in its parcels owned in fee title; maintenance of scenic easements is the responsibility of the owner. The current annual budget for open space active management is \$80,000, which is used to manage all lands in parcels owned in fee title. Approximately 63% of DMFF parcels owned in fee title are within the areas of proposed critical habitat, as shown in the table below.

Table 13: Del Monte Forest Foundation Land within Proposed Critical Habitat

DMFF Parcels Owned in Fee Title	Corresponding PCH Unit	Approximate Acreage
SFB Morse Botanical Reserve	Unit 6A	84
Indian Village	Unit 6C	21
Crocker Grove	Unit 6D	13
Navajo Tract and Navajo North	Unit 6E	26
Total DMFF Parcels Owned in Fee Title within PCH		143
Total DMFF Parcels Owned in Fee Title		229
Percentage of Parcels Owned in Fee Title within PCH		63%

Source:
Del Monte Forest Foundation website at: <http://www.delmonteforestfoundation.org/Properties.html>, site accessed March 2, 2007.

Approximately 63% of the annual budget for open space active management (\$50,011) is aiding in the conservation of the piperia and its habitat.¹¹⁴

¹¹⁴ Personal communication from Forester, Staub Forestry and Environmental Consultants, January 23, 2007.

Table 14: Estimated Economic Impacts to Del Monte Forest Foundation, Units 6a, 6c, 6d, 6e

Threat	Management Action	Past Cost			Future Costs		
		Undiscounted Dollars	Present Value (3%)	Present Value (7%)	Undiscounted Dollars	Present Value (3%)	Present Value (7%)
Adverse effects from adjacent existing and future development:		\$1,000	\$1,061	\$1,145	\$1,000,218	\$744,036	\$529,816
Loss of adjacent forest canopy	None. No management actions can be taken	\$0	\$0	\$0	\$0	\$0	\$0
The introduction of pathogens or disease	None. No management actions can be taken	\$0	\$0	\$0	\$0	\$0	\$0
Increased trampling	Maintain trails and direct people towards those trails	\$0	\$0	\$0	included in cost above		
Potential hydrologic changes	Control stormwater runoff	\$0	\$0	\$0	included in cost above		
Overspray of pesticides	Control pesticide runoff.	\$0	\$0	\$0	included in cost above		
Mowing	Mow when piperia dormant; reduce impacts to piperia	\$0	\$0	\$0	included in cost above		
Introduction and spread of invasive plants	Conduct regular invasive species removal projects	\$0	\$0	\$0	included in cost above		
Herbivory	Monitor. If necessary, install cages around piperia plants	\$0	\$0	\$0	included in cost above		
Increased understory growth due to exclusion of wildfire	Monitor. No action needed until threat better understood	\$0	\$0	\$0	included in cost above		
Total		\$1,000	\$1,061	\$1,145	\$1,000,218	\$744,036	\$529,816
Annualized Cost					\$48,554	\$46,739	

Notes:

- (1) All threats are managed through the open space management budget, therefore the total cost is presented once for all threats.
- (2) 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).

The City of Pacific Grove

The City of Pacific Grove (the City) owns 19 acres in unit 6e.¹¹⁵ Although threats of adjacent *future* development are identified in unit 6 in general, the Service does not consider this to be a threat to the piperia on the land owned by the City in unit 6e.¹¹⁶ Therefore, no costs of managing this threat are calculated.

Adverse effects from adjacent *existing* development, however, may pose a threat to the proposed critical habitat. As stated above, adverse effects include: the loss of adjacent forest canopy, increased trampling, potential hydrologic changes, overspray of pesticides, the introduction of pathogens or disease, mowing, and the introduction and spread of invasive plant species. The Service has advised that the loss of adjacent forest canopy and the introduction of pathogens and disease cannot be avoided and did not recommend implementing any actions to lessen the impact of these threats.¹¹⁷

The land proposed as critical habitat is known as the Lynn “Rip” Van Winkle Open Space. It is an open pine and oak forest with sparse understory that is used by the public for walking and as a dog park. The City does not regulate or maintain this Open Space; any one may enter at no cost.¹¹⁸

Trampling in the area of proposed critical habitat is not controlled. The trails going through the Open Space are not marked or maintained.¹¹⁹ If special management is needed, the Service recommends eliminating any trails that go through piperia populations and redirecting people with signs.¹²⁰ The economic impacts to the City of eliminating trails and purchasing and maintaining signs is estimated to be approximately \$2,880 over the next 20 years in undiscounted dollars.¹²¹

Hydrologic changes are controlled through State Water Resources Control Board approved stormwater best management practices that the City adopted in September of 2006. Potential hydrologic changes are likely already addressed as part of residential and recreational development plans, and it is likely that no further precautionary measures

¹¹⁵ 71 FR 61559.

¹¹⁶ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 11, 2007.

¹¹⁷ Personal communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 11, 2007.

¹¹⁸ Personal communication from Director, Public Works Department, City of Pacific Grove, February 6, 2007.

¹¹⁹ Personal communication from Director, Public Works Department, City of Pacific Grove, February 6, 2007.

¹²⁰ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 30, 2007.

¹²¹ Cost estimate provided by Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 30, 2007.

would be needed.¹²² The location of the proposed critical habitat in the Open Space is removed from existing or planned future development. Therefore, hydrologic changes are not considered to greatly threaten the piperia.¹²³

The City sprays pesticides and occasionally mows along Congress Road (the road that runs along the east side of the proposed critical habitat). Pesticide spraying and mowing is conducted within 5 feet of the road. The road is located 100 feet or more from the Open Space. Therefore, the City does not consider its pesticide spraying or occasional mowing activities to threaten the piperia habitat. No pesticide spraying or mowing occurs within the Open Space.

The Service recommends that landowners implement ongoing programs, as needed, to control invasive species.¹²⁴ The City does not control invasive species within the Open Space. If it is determined that the City needs to implement a comprehensive invasive species control program, the cost would be approximately \$2,051 in undiscounted dollars over the next 20 years based on the cost of invasive species control provided by the Elkhorn Slough Foundation.

In a 2006 habitat characterization, it was determined that rates of deer browsing were very low in unit 6e, possibly due to the occurrence of the dog park.¹²⁵ The Service considers herbivory to not be a threat in unit 6e, although herbivory was identified as a threat in the other subunits of unit 6.¹²⁶ Therefore, no costs of managing this threat are calculated for the City of Pacific Grove.

Increased understory growth due to exclusion of wildfire was identified as a threat in all of unit 6. Since the understory ecology may vary across subunits in unit 6, the Service recommends monitoring each unit until the understory dynamics are better understood.¹²⁷ According to a monitoring plan developed by the Service, monitoring would involve three years of developing conducting, and adjusting a monitoring plan, monitoring every four-five years for twenty years, and a final analysis at the end of the twenty-year monitoring period. The total cost of the monitoring would be approximately \$20,000 in undiscounted dollars.¹²⁸

¹²² Personal communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 11, 2007.

¹²³ Personal communication from Director, Public Works Department, City of Pacific Grove, February 6, 2007.

¹²⁴ Personal communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 11, 2007.

¹²⁵ EcoSystems West Consulting Group, *Habitat Characterization for Yadon's piperia (Piperia yadonii) Within the Forested Habitat of the Monterey Peninsula*, October 9, 2006, p. 73.

¹²⁶ Electronic communication with Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 11, 2007.

¹²⁷ Electronic communication with Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 11, 2007.

¹²⁸ Electronic communication with Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, April 23, 2007.

Table 15: Estimated Economic Impacts to the City of Pacific Grove, Unit 6e

Threat	Management Action	Past Cost	Future Costs		
			Undiscounted Dollars	Present Value (3%)	Present Value (7%)
Adverse effects from adjacent existing and future development	See below:				
Loss of adjacent forest canopy	None. No management actions can be taken	\$0	\$0	\$0	\$0
Introduction of pathogens or disease	None. No management actions can be taken	\$0	\$0	\$0	\$0
Increased trampling	Remove trails and direct people away from habitat with signs	\$0	\$2,880	\$2,554	\$1,809
Potential hydrologic changes	Ensure runoff is controlled	\$0	\$0	\$0	\$0
Overspray of pesticides	Ensure pesticide use is controlled. Educate residents and golf course managers	\$0	\$0	\$0	\$0
Mowing	Educate residents to mow outside flowering stage and reduce impacts to piperia.	\$0	\$0	\$0	\$0
The introduction and spread of invasive plant species	Control invasive species in the habitat	\$0	\$2,051	\$1,536	\$1,105
Herbivory	None. Determined not a threat in unit 6e	\$0	\$0	\$0	\$0
Increased understory growth due to exclusion of wildfire	Monitor. No management action needed until threat better understood.	\$0	\$20,000	\$16,307	\$13,254
Total		\$0	\$24,931	\$20,397	\$16,169
Annualized Cost				\$1,331	\$1,426

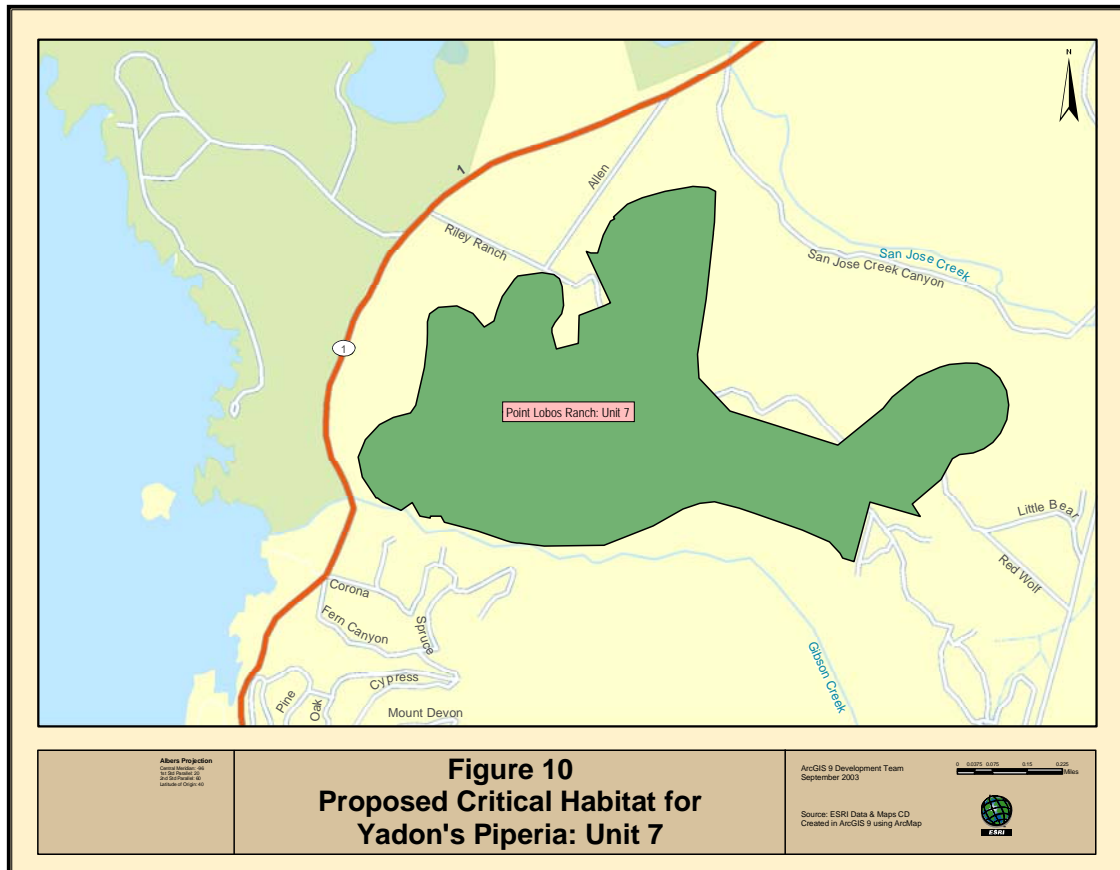
Notes:

- (1) Costs of invasive species control is based on per-acre costs provided by the Elkhorn Slough Foundation.
- (2) Monitoring cost estimate based on monitoring plan developed by the Service.
- (3) 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).

VI.G Unit 7: Point Lobos

Threats that may require special management in this unit are: the growth and spread of invasive plant species, such as French broom; and erosion. Use of herbicides should be controlled to avoid or minimize effects to the species. Access by park visitors may need to be managed to avoid trampling in Monterey pine forest populations.¹²⁹

Loss of habitat from residential development is no longer a threat in this unit because private lands were not proposed for critical habitat designation in this unit.



This unit consists of 228 acres of land owned by the California State Department of Parks and Recreation, and 97 acres that were owned by the Big Sur Land Trust, but have recently been added to the State Parks system.

The California State Department of Parks and Recreation (State Parks) has been controlling nonnative invasive plant species in this unit. The invasives removal process occasionally involves the use of herbicides. State Parks trains its personnel to identify and avoid the piperia when removing invasive plants manually or with herbicides. The State Parks invasive plant removal efforts cost \$5,000-\$10,000 annually depending on

¹²⁹ 71 FR 61559.

whether or not volunteer inmate labor or hired labor is used. The cost of training the personnel to recognize and avoid the piperia during invasive species removal is about \$500 per year.¹³⁰

The Big Sur Land Trust made minimal efforts on the land it owned to control French broom and Jubata grass. Past costs, including staff and equipment, since the time of listing are approximately \$1,000.¹³¹

In 2003, a survey of the area found that the piperia was threatened by sediment runoff from an unpaved road within the area of proposed critical habitat.¹³² Erosion is no longer considered a threat to the piperia by State Parks, because the road documented in the 2003 survey has since been paved over. Therefore, erosion is not currently managed by State Parks.¹³³ However, the piperia may be threatened by erosion and sedimentation from altered drainage patterns and piles of road-side sediment that resulted from the paving of the road.¹³⁴

Monitoring will be needed to characterize the erosion and sedimentation problem. The cost of annual monitoring to characterize the erosion problem would be about \$200 per year.¹³⁵ If the monitoring efforts find erosion or sedimentation is indeed a threat, the cost of controlling it could be approximately \$10,000 over the next 20 years to implement best management practices along the road.¹³⁶

Access by park visitors is currently restricted by State Parks. No public access is allowed in the area where the piperia grows.¹³⁷ The Big Sur Land Trust did not allow open public access in the area proposed to be critical habitat when it owned the land.¹³⁸ The Service has stated that no management actions need to be taken to control this threat at this time.¹³⁹

¹³⁰ Personal communication from staff, California Department of Parks and Recreation, December 6 and December 15, 2006.

¹³¹ Personal communication from staff, Big Sur Land Trust, December 14, 2006.

¹³² Graff et al, California Native Species Field Survey Forms, June 15, 2003.

¹³³ Personal communication from staff, California Department of Parks and Recreation, December 6 and December 15, 2006.

¹³⁴ Personal communication from staff, Big Sur Land Trust, December 14, 2006.

¹³⁵ Personal communication from staff, California Department of Parks and Recreation, December 15, 2006.

¹³⁶ Personal communication from staff at California Department of Parks and Recreation, April 23, 2007. Confirmed by Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, April 30, 2007.

¹³⁷ Personal communication from staff, California Department of Parks and Recreation, December 6, 2006.

¹³⁸ Personal communication from staff, Big Sur Land Trust, December 14, 2006.

¹³⁹ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, December 12, 2006.

Table 16: Estimated Economic Impacts to California State Department of Parks and Recreation, Unit 7

Threat	Management Action	Past Costs			Future Costs		
		Undiscounted Dollars	Present Value (3%)	Present Value (7%)	Undiscounted Dollars	Present Value (3%)	Present Value (7%)
The growth and spread of invasive plant species	Remove invasive species from piperia habitat	\$61,000	\$77,273	\$104,809	\$150,000	\$111,581	\$79,455
Use of herbicides when removing invasive species	Train personnel to use herbicides carefully	\$4,000	\$5,067	\$6,873	\$10,000	\$7,439	\$5,297
Erosion	Monitor	\$0	\$0	\$0	\$4,000	\$2,975	\$2,975
	If necessary, control erosion	\$0	\$0	\$0	<i>\$10,000</i>	<i>\$7,439</i>	<i>\$5,297</i>
Park visitors trailing in Monterey Pine forest	None. Determined no longer a threat	\$0	\$0	\$0	\$0	\$0	\$0
Total		\$65,000	\$82,340	\$111,682	\$174,000	\$129,434	\$93,025
Annualized Cost					\$8,447	\$8,206	

Notes:

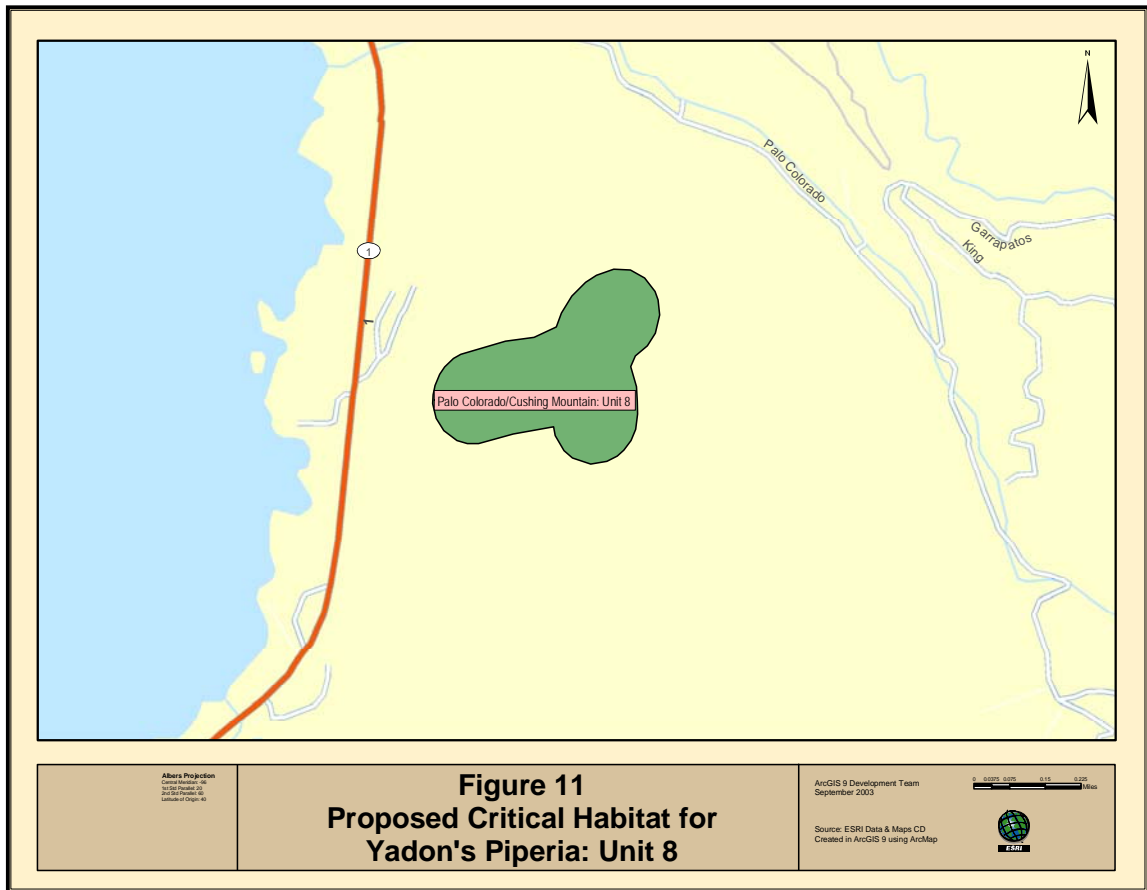
(1) Italicized costs are costs that will be incurred only if necessary after monitoring and further research.

(2) 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).

VI.H Unit 8: Palo Colorado

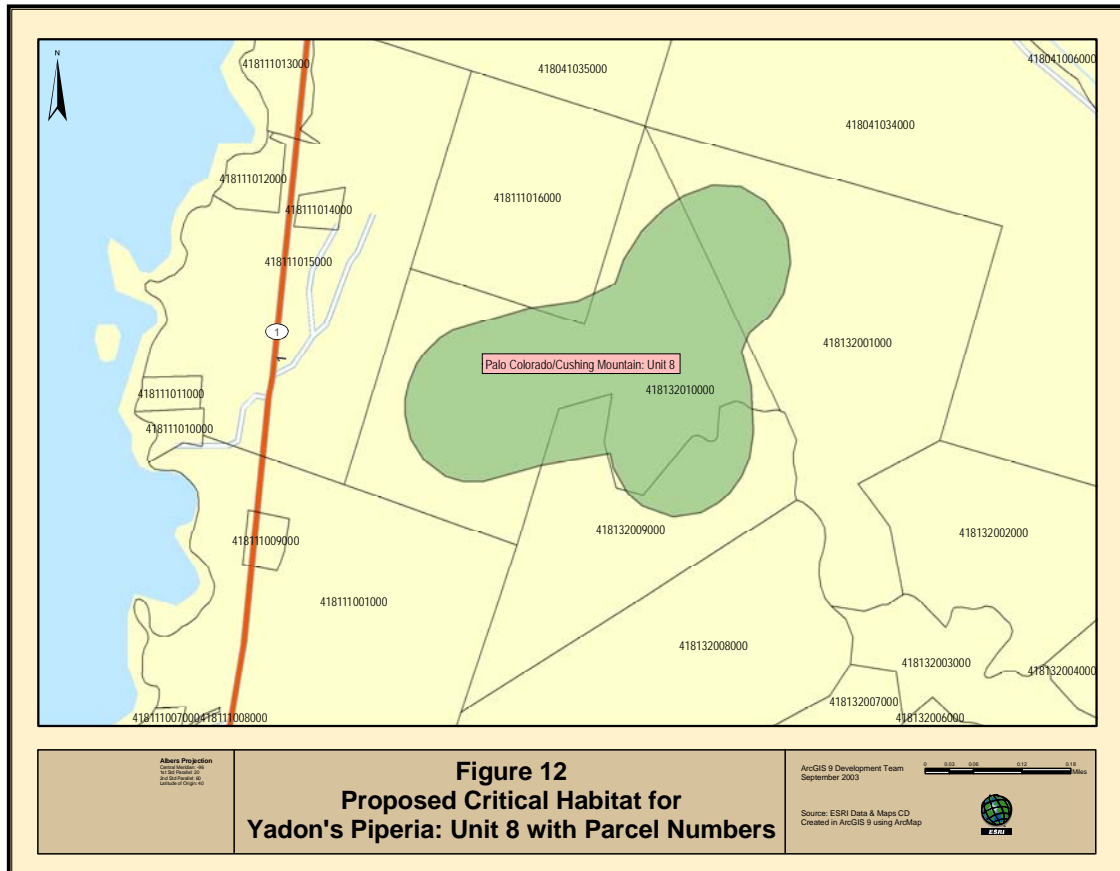
Threats that may require special management in this unit are habitat fragmentation and habitat degradation from road and trail grading and from future development, such as the introduction and spread of nonnative plants, removal of native vegetation, erosion, and hydrologic changes.¹⁴⁰

¹⁴⁰ 71 FR 61559.



This unit consists of 73 acres of private land on the Big Sur coast.¹⁴¹ The parcels of private land are displayed in the map below.

¹⁴¹ *Ibid.*



There are 4 parcels that overlap this unit. Three parcels are owned by the same entity, together comprising over 72 acres of the proposed critical habitat unit. The fourth parcel, which is in the northwest corner of the unit and only overlaps the unit by less than one acre, is owned by a different entity. According to the Monterey County Planning and Building Department, all 4 parcels are zoned “Watershed and Scenic Conservation” with a zoning density of 40 acres per parcel (WSC/40).¹⁴²

In February of 2005, the Monterey County Planning and Building Department approved a request for an after-the-fact permit for a water system to serve five parcels, three of which are parcels 418132001000, 418132009000, and 418132010000 in the proposed critical habitat. The other two parcels included in the request for a permit for a water system (418132008000 and 418132002000) are located southeast of the area of proposed critical habitat. As of the writing of this report, no mitigation measures have been placed on this permit; mitigation measures may be placed on the project during the final review stage.¹⁴³

¹⁴² Electronic communication from Assistant Planner, Monterey County RMA-Planning Department, December 19 and 27, 2006.

¹⁴³ *Ibid.*

Lost surplus from development opportunities is still too hypothetical to estimate because no other building permit applications have been submitted to the Monterey County Planning and Building Department for these 4 parcels. Aside from the potential cost of measures to conserve the piperia, no other economic impacts are estimated for this unit.

Special management may be needed to control the threats in this subunit identified in the proposed rule.¹⁴⁴ The cost of controlling invasive species and erosion are included in the cost summary table below. It is assumed that vegetation removal can occur outside the flowering stage of the piperia at no additional cost and that the cost of adopting and implementing best management practices is not attributable to the presence of the species (i.e. best management practices are usually already incorporated into development projects).

Threat	Management Action	Past Cost	Future Costs		
			Undiscounted Dollars	Present Value (3%)	Present Value (7%)
Habitat fragmentation and degradation from road and trail grading and future development, including:	Curtail or significantly reduce residential development; reduce impacts on piperia	\$0	\$0	\$0	\$0
Introduction and spread of nonnative plants	Conduct regular invasive species removal projects	\$0	\$7,767	\$5,788	\$4,133
Removal of native vegetation	Remove vegetation when piperia is dormant	\$0	\$0	\$0	\$0
Erosion	Monitor	\$0	\$6,900	\$5,133	\$3,655
	If necessary, control erosion	\$0	\$20,334	\$15,126	\$10,771
Hydrologic changes	Implement best management practices to reduce runoff	\$0	\$0	\$0	\$0
Total		\$0	\$35,001	\$26,047	\$18,559
Annualized Cost				\$1,700	\$1,637
Notes:					
(1) Cost of invasive plant species control based on per-acre cost from Elkhorn Slough Foundation.					
(2) Monitoring cost estimate based on monitoring plan developed by Graff (2006).					
(3) Cost of controlling erosion based on per-acre cost from Elkhorn Slough Foundation					
(4) 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).					

¹⁴⁴ The Service cannot require private landowners to take actions to conserve the species. However, if the private land owners are interested in reducing threats to piperia, the Service would make recommendations on how to best manage the land for conservation purposes.

VII Secondary Economic Effects

This section of the report details the screening analysis of potential effects on the energy industry and small entities.

VII.A Impacts on the Energy Industry

Pursuant to Executive Order 13211, Federal agencies are required to submit a summary of the potential effects of regulatory actions on the supply, distribution, and use of energy, assuming those actions meet certain criteria outlined by the OMB:¹⁴⁵

- Reductions in crude oil supply in excess of 10,000 barrels per day;
- Reductions in fuel production in excess of 4,000 barrels per day;
- Reductions in coal production in excess of 5 million tons per year;
- Reductions in natural gas production in excess of 25 million mcf per year;
- Reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity;
- Increases in energy use required by the regulatory action that exceed any of 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.

Subunit 3a, in Vierra Canyon, consists of 17 acres of private land overlain by a Pacific Gas and Electric Company easement. PG&E has power lines and towers in the subunit and a road running through the subunit which it uses to access its towers. PG&E does not plan to build or develop this land any further.¹⁴⁶ Designation of critical habitat is not expected to lead to any adverse outcomes such as a reduction in electricity production or an increase in cost of energy production or distribution.

VII.B Impacts on Small Entities

In accordance with Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) in 1996, when a Federal agency publishes a notice of rulemaking for any proposed or final rule, it must make available for public comments a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to

¹⁴⁵ U.S. Office of Management and Budget, "Memorandum for Heads of Executive Departments and Agencies, and Independent Regulatory Agencies," July 13, 2001.

¹⁴⁶ Electronic communication from Manager, Environmental Policy, Habitat & Species Protection, PG&E, January 4, 2007.

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.¹⁴⁷

To assist in this process, the following represents a screening level analysis of the potential for piperia conservation efforts to affect small entities. This analysis is based on the estimated impacts associated with the proposed rulemaking as described in Section VI of this analysis.

Table 18 summarizes the results of the screening analysis. Four small entities (two non-profit organizations, one city government, and one private developer), are potentially affected by the proposed critical habitat designation for the piperia.

Table 18: Potentially Affected Small Entities	
Small Entity	Annualized Impact (3% Discount Rate)
Elkhorn Slough Foundation	\$2,037
Del Monte Forest Foundation	\$48,554
City of Pacific Grove	\$1,331
Single Developer	\$168,359
Total	\$220,281
<p>Sources:</p> <p>(1) Personal communication from Land Manager, Elkhorn Slough Foundation, December 13, 2006.</p> <p>(2) Electronic communication from , Coastal Training Program Coordinator, Elkhorn Slough National Estuarine Research Reserve, January 18, 2007.</p> <p>(3) Personal communication from Forester, Staub Forestry and Environmental Consultants, January 23, 2007.</p> <p>(4) Personal communication from Director, Department of Community Development, City of Pacific Grove, January 18, 2007.</p> <p>(5) Graff, Alison, A Long-term Monitoring Program for the Federally Endangered Yadon’s Rein Orchid (<i>Piperia yadonii</i>, Orchidaceae), October 30, 2006.</p> <p>(6) U.S. Census Bureau American Fact Finder, City of Pacific Grove Fact Sheet, www.census.gov, site accessed January 19, 2007.</p> <p>(7) Electronic and personal communication from Assistant Planner, Monterey County RMA-Planning Department, December 19 and 27, 2006, and January 24, 2007.</p> <p>(8) Personal communication from building permit applicants, January 5 and 18, 2007.</p> <p>(9) Biological Consultant for the Pebble Beach Company, March 5, 2007.</p>	

¹⁴⁷ EPA, “Revised Interim Guidance for EPA Rulewriters: Regulatory Flexibility Act as Amended by the Small Business Regulatory Enforcement Fairness Act,” 29 March 1999, p.11.

The remainder of this section describes the screening analysis in greater detail. It first identifies the businesses, governments, and not-for-profit organizations that may experience impacts due to piperia conservation efforts within or adjacent to the potential critical habitat.¹⁴⁸ Then, it identifies those entities that are likely to be small. Finally, it provides a more detailed description of the specific type of impacts potentially affecting small entities.

VII.B.1 Identification of Potentially Affected Small Entities

This analysis estimates prospective economic impacts due to implementation of piperia conservation activities. Table 19 lists each business, government, or organization potentially affected by conservation measures designed to protect the plant. For a detailed discussion of the activities of each entity on land proposed as critical habitat, see Section VI of this report.

¹⁴⁸ The Stevenson School was also identified as an organization that may experience impacts due to piperia conservation efforts. However, as explained in Section VI above, the outcome of the Monterey County permitting process is difficult to determine, given the information currently available. Therefore, impacts to the Stevenson School are discussed qualitatively in Section VI, but the impacts are not quantified.

Table 19: Potentially Affected Businesses, Governments, or Organizations

Potentially Affected Entities	Threats
Elkhorn Slough Foundation	<ul style="list-style-type: none"> ▪ Removal of the piperia occurrence or its associated natural community to accommodate road construction, agricultural, or other facilities ▪ The growth and spread of invasive plant species ▪ Erosion from old roadbeds or past earth-moving activities ▪ Herbivory ▪ Lack of potential pollinators ▪ Disease ▪ Vegetation removal for fuel reduction purposes
Monterey County Parks Department	<ul style="list-style-type: none"> ▪ Vegetation removal for fuel reduction purposes ▪ The growth and spread of invasive plant species ▪ Disease ▪ Herbivory ▪ Lack of potential pollinators
Private Developers	<ul style="list-style-type: none"> ▪ Elimination or further fragmentation of habitat from development ▪ Habitat fragmentation and degradation from road and trail grading and future development ▪ Vegetation removal for fuel reduction purposes ▪ The growth and spread of invasive plant species ▪ Herbivory ▪ Disease ▪ Lack of potential pollinators
Pacific Gas and Electric (PG&E)	<ul style="list-style-type: none"> ▪ Elimination or further fragmentation of habitat from development ▪ Grading or other vegetation removal (e.g. for fuel reduction purposes or roads) ▪ The spread of invasive plant species
California Department of Transportation (Caltrans)	<ul style="list-style-type: none"> ▪ Elimination or further fragmentation of habitat from development ▪ Grading or other vegetation removal (e.g. for fuel reduction purposes or roads) ▪ The spread of invasive plant species
Pebble Beach Company	<ul style="list-style-type: none"> ▪ Elimination or further fragmentation of habitat from adjacent existing and future development ▪ The spread of invasive plant species ▪ Habitat degradation by motorized vehicles and encampments ▪ Debris dumping ▪ Herbivory ▪ Increased understory growth due to exclusion of wildfire
Del Monte Forest Foundation	<ul style="list-style-type: none"> ▪ Elimination or further fragmentation of habitat from adjacent existing and future development ▪ Herbivory ▪ Increased understory growth due to exclusion of wildfire
City of Pacific Grove	<ul style="list-style-type: none"> ▪ Elimination or further fragmentation of habitat from adjacent existing and future development ▪ Herbivory ▪ Increased understory growth due to exclusion of wildfire
California State Department of Parks and Recreation	<ul style="list-style-type: none"> ▪ The growth and spread of invasive plant species ▪ Uncontrolled use of herbicides ▪ Erosion ▪ Access by park visitors trailing in Monterey pine forest populations

Table 20 lists the Small Business Administration's (SBA's) standard defining "small" entities for each government, organization, or business potentially affected. Most of the total impact estimated in Section VI will be borne by private landowners. The County of Monterey and California State Departments are not considered "small" by SBA, because they are governments that serve populations exceeding 50,000. The "small" entities are discussed in greater detail below.

Entity	SBA Size Standard	Meets SBA's Definition of a Small Entity?
Monterey County Parks Department	Governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000	No
Caltrans		No
California State Department of Parks and Recreation		No
City of Pacific Grove		Yes
Elkhorn Slough Foundation	Not-for-profit enterprise that is independently owned and operated and not dominant in its field	Yes
Del Monte Forest Foundation		Yes
Pebble Beach Company	Golf Courses and Country Clubs: \$6.5 million	No
PG&E	Electric Utility: 4 million megawatt hours of total electric output for preceding fiscal year	No
Private Developer	New Single-Family Housing Construction: \$31.0 million	Yes

Notes:
 (1) The Elkhorn Slough Foundation, Del Monte Forest Foundation, and Private Developers are considered small entities for the purposes of this analysis.
 Sources:
 (1) SBA size standards for governments and not-for-profit enterprises taken from SBA, Office of Advocacy, *A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act*, May 2003, p. 12. Size standard for NAICS codes 221122, 236115, and 713910 taken from NAICS Association, "Small Business Size Standards - Matched to NAICS," at http://www.naics.com/sba_sizestandards.htm, December 21, 2006.
 (2) County population data obtained from U.S. Census Bureau: State and County QuickFacts, <http://quickfacts.census.gov/qfd/states/06/06053.html>, December 21, 2006.

VII.B.2 Impacts on the Revenues of Potentially Affected Small Entities

The Elkhorn Slough Foundation

The Elkhorn Slough Foundation is "a nonprofit, member-supported organization working to conserve and restore Elkhorn Slough and its watershed. The Foundation works with local, state, and national constituencies to protect [its] natural heritage."¹⁴⁹ For the purposes of this analysis, we assume that the Elkhorn Slough Foundation is a small entity.

The past costs of controlling the growth and spread of invasive species within the area of proposed critical habitat since the time of listing are approximately \$14,450 over the past

¹⁴⁹ Elkhorn Slough Foundation, Home Page, as viewed at <http://www.elkhornslough.org/esf.htm>, on December 21, 2006.

7.5 years.¹⁵⁰ The cost of developing the fact sheets to identify the piperia when doing invasive species removal was approximately \$5,318.¹⁵¹ Costs of maintaining control of the invasive species within the proposed critical habitat in the future are expected to be approximately \$1,900 per year, in undiscounted terms.¹⁵²

The cost of controlling erosion within the piperia habitat since the time of the listing has been approximately \$100,000. Future costs are expected to be no more the \$1,000 in total over the next 3-4 years.¹⁵³

The Service has advised that the Foundation continue surveying the piperia for possible herbivory. The need for action to protect the piperia will depend on the outcome of the surveying. If the surveying finds herbivory to be a problem, the cost to the Foundation of installing cages around the plants would be around \$640 initially. The annual cost of checking on the cages would be around \$60. The cages need to be replaced every 10 years at a cost the same as the initial installation, about \$640.¹⁵⁴

In total, the annualized impacts to Elkhorn Slough Foundation at a 3% discount rate are approximately \$2,037.

The Del Monte Forest Foundation

The Del Monte Forest Foundation, Inc. (DMFF) is a non-profit organization that is designated by Monterey County and the California Coastal Commission to be a recipient of open space scenic easements, and fee interests in the Del Monte Forest, as laid out in the Del Monte Forest Land Use Plan.¹⁵⁵

The DMFF has contributed a small amount of funds to a survey effort that was conducted by the Pebble Beach Company for its DMF / PDP. The DMFF estimates that it contributed approximately \$1,000 to the survey effort.

The DMFF's current open space active management efforts are controlling the threats the Service identified in lands owned by the DMFF. The current annual budget for open space active management is \$80,000, which is used to manage all DMFF's lands. Approximately 63% of DMFF lands are within the areas of proposed critical habitat. Therefore, approximately 63% of the annual budget for open space active management (\$50,011) is aiding in the conservation of the piperia and its habitat.

¹⁵⁰ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, December 18, 2006.

¹⁵¹ Personal communication from Coastal Training Program Coordinator, Elkhorn Slough National Estuarine Research Reserve, January 18, 2007.

¹⁵² Personal communication from Land Manager, Elkhorn Slough Foundation, December 13, 2006.

¹⁵³ *Ibid.*

¹⁵⁴ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, December 18, 2006.

¹⁵⁵ Del Monte Forest Foundation, Inc. website at: <http://www.delmonteforestfoundation.org/index.html>, site visited January 10, 2007.

In total, the annualized impacts to Del Monte Forest Foundation at a 3% discount rate are approximately \$48,554.

The City of Pacific Grove

The City of Pacific Grove had a population of approximately 15,522 in the 2000 population census, which confirms its status as a small entity.¹⁵⁶ The location of proposed critical habitat on City of Pacific Grove land is part of the Lynn “Rip” Van Winkle Open Space, which is not actively managed but has been set apart from existing or planned future development.

Trampling in the Open Space is not controlled.¹⁵⁷ The Service recommends eliminating any trails that go through piperia populations and redirecting people with signs.¹⁵⁸ The economic impacts to the City of eliminating trails and purchasing and maintaining signs would be approximately \$2,880 over the next 20 years in undiscounted dollars.¹⁵⁹

If it is determined that the City needs to implement a comprehensive invasive species control program, the cost would be approximately \$1,046 in undiscounted dollars over the next 20 years based on the cost of invasive species control provided by the Elkhorn Slough Foundation.

The Service recommends monitoring understory growth in each unit, but not taking any actions until the specific understory dynamics are better understood.¹⁶⁰ According to a monitoring plan developed by the Service, such a monitoring effort would cost approximately \$20,000 over 20 years.¹⁶¹

In total, the annualized impacts to The City of Pacific Grove at a 3% discount rate are approximately \$1,331.

Single Private Developer

One private landowner owns the three parcels that overlap unit 2b. The landowner completed an application with the Monterey County Planning and Building Department for a 10 lot subdivision in September of 2006. As of the writing of this report, no

¹⁵⁶ U.S. Census Bureau Quick Facts website at: <http://censtats.census.gov/data/CA/1600654848.pdf>, site accessed January 10, 2007.

¹⁵⁷ Personal communication from Director, Public Works Department, City of Pacific Grove, February 6, 2007.

¹⁵⁸ Electronic communication from Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 30, 2007.

¹⁵⁹ Cost estimate provided by Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 30, 2007.

¹⁶⁰ Electronic communication with Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, January 11, 2007.

¹⁶¹ Electronic communication with Diane Steeck, Ecologist, U.S. Fish and Wildlife Service, April 23, 2007.

mitigation measures had been placed on this project. However, mitigation measures may still be placed on the project in the final review stage.¹⁶²

The landowner estimates that the application has been delayed approximately 2 years due to its proximity to environmentally sensitive habitat. Delay cost is calculated by multiplying lost surplus per house by the number of houses, the interest rate (15%), and the years of delay. Delay cost for the 10 parcel subdivision is estimated at \$900,000. Since this is a stream of ongoing impacts, half of the cost of delay is assigned to the past and half is assigned to future.

As stated above, the Monterey County Planning and Building Department may still place mitigation measures on the project. The mitigation measures that could be placed on the project are uncertain at this point. Mitigation measures may range from simple protections, at a negligible cost, to denial of the permit.¹⁶³ If the subdivision application is denied and the 10 lot subdivision is not allowed to be built, lost surplus from development could be as high as \$3,000,000. Therefore, cost of possible mitigation measures range from \$0 - \$3,000,000.

In addition to mitigating the potential impacts of residential development, the single developer may conduct invasive plant species removal efforts and monitor the area for herbivory, disease, and pollinators. The cost over twenty years of conducting these measures could be around fifteen thousand dollars.

In total, the annualized impacts to the Private Developer at a 3% discount rate could be as high as \$168,359 dollars.

¹⁶² Electronic communication from Assistant Planner, Monterey County RMA-Planning Department, December 19 and 27, 2006.

¹⁶³ Personal communication from Assistant Planner, Monterey County RMA-Planning Department, January 24, 2007.

Appendix A: Past Estimated Economic Impacts

This appendix summarizes past economic impacts. Past costs are the costs of efforts to conserve the piperia in the areas of proposed critical habitat between the time it was listed in August 1998 and the present (2006). Past costs were calculated by interviewing the affected entities within critical habitat to determine if any resources had been expended on management, consultation with the Service, or other activities intended to conserve the species. Past costs also include the value of any lost economic opportunities attributable to listing.

For a detailed account of past activities intended to conserve the species or lost economic opportunities see the discussion of economic impacts on each affected entity in section VI above. A summary of past economic impacts are presented in the table below.

Entity	PCH Units	Past Cost		
		Undiscounted Dollars	Present Value (3%)	Present Value (7%)
Elkhorn Slough Foundation	1a, 1b, 2a	\$119,768	\$155,151	\$216,680
Private Landowners	2b, 8	\$450,000	\$477,405	\$515,205
Monterey County	2c	\$26,000	\$26,872	\$28,138
Pacific Gas & Electric	3a	\$0	\$0	\$0
CA Dept. of Transportation	3b, 3c	\$7,000	\$7,662	\$8,654
Pebble Beach Company	4, 5, 6a, 6b, 6c, 6e	\$0	\$0	\$0
Del Monte Forest Foundation	6a, 6c, 6d, 6e	\$1,000	\$1,061	\$1,145
City of Pacific Grove	6e	\$0	\$0	\$0
CA Dept. of Parks and Recreation	7	\$65,000	\$82,340	\$111,682
Total		\$668,768	\$750,491	\$881,504

Notes:
 (1) 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).